

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Faculty Publications in Educational
Administration

Educational Administration, Department of

Spring 2017

Academic Advising and the Persistence Intentions of Community College Students in their First Weeks in College

Deryl K. Hatch

University of Nebraska–Lincoln, derylhatch@unl.edu

Crystal E. Garcia

University of Nebraska-Lincoln, crystalgarcia@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/cehsedadfacpub>



Part of the [Community College Education Administration Commons](#), [Community College Leadership Commons](#), [Higher Education Commons](#), and the [Student Counseling and Personnel Services Commons](#)

Hatch, Deryl K. and Garcia, Crystal E., "Academic Advising and the Persistence Intentions of Community College Students in their First Weeks in College" (2017). *Faculty Publications in Educational Administration*. 40.

<https://digitalcommons.unl.edu/cehsedadfacpub/40>

This Article is brought to you for free and open access by the Educational Administration, Department of at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Faculty Publications in Educational Administration by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

The Review of Higher Education

Spring 2017, Volume 40, No. 3, pp. 353–390

Copyright © 2017 Association for the Study of Higher Education

All Rights Reserved (ISSN 0162–5748) Used by permission.

doi:10.1353/rhe.2017.0012

Academic Advising and the Persistence Intentions of Community College Students in their First Weeks in College

Deryl K. Hatch and Crystal E. Garcia

Persistence of community college students is a serious and perennial concern with numerous published figures illustrating the daunting odds that students and institutions face along their path to college completion (Calcagno, Crosta, Bailey, & Jenkins, 2007; Provasnik & Planty, 2008). Although researchers have made headway in identifying influential factors in students' successful persistence along that path, evidence suggests that attrition in community colleges can begin to occur within the first term and even between enrollment and the first day of class (Bailey, 2009; Bailey, Jeong, & Cho, 2010; Brooks-Leonard, 1991). While some researchers have explored the critical role of the early weeks of college experiences in student success (Astin, 1993; Tinto, 1988; Woosley, 2003; Woosley & Miller, 2009), studies specific to re-

Deryl K. Hatch is Assistant Professor in the Educational Administration department of the University of Nebraska–Lincoln.

Crystal E. Garcia is a PhD candidate and Graduate Assistant in the Educational Administration department of the University of Nebraska–Lincoln.

Deryl Hatch presented preliminary findings from this study at the 2012 annual meeting of the Association for Institutional Research (AIR) Forum, New Orleans, LA. Address queries to Deryl Hatch at 119 Teachers College Hall, Lincoln NE 68588-0360; phone 402-472-4231; fax 402-472-4300; email: derylhatch@unl.edu

tention and persistence regarding this timeframe remain scarce, especially in the two-year college sector where 4 out of 10 new college students enroll (American Association of Community Colleges, 2015) and where student persistence issues are qualitatively different from the four-year sector (M. W. Webb, 1989).

Given community colleges' open enrollment policies and their numerous instructional missions (A. M. Cohen & Brawer, 2008), students enter and re-enter with various and often multiple objectives but not always with clear knowledge of how to clarify and accomplish them. The first few weeks present opportunities and pitfalls as new or re-entering students encounter institutional processes that enhance or detract from students' ability to start right on their path. Scott-Clayton (2011) compared the typical community college intake process to navigating a shapeless river on a dark night where "many students make false starts, take wrong turns, and hit unexpected obstacles" (p. 1). Some of these obstacles have the potential to impact persistence decisions from the outset. Despite Barnett's (2011) observation that we need a greater focus on community college classroom practices related to persistence, it remains true that, at least for the first weeks, an entering community college student's experience is characterized as much by the classroom experience as it is by early procedures and processes such as registration, placement, orientation, financial aid, and particularly academic advising (King, 1993). Even seemingly less critical intake procedures have been connected to student persistence within the community college literature such as registration timing (Hale & Bray, 2011; Smith, Street, & Olivarez, 2002) and course adding and dropping behaviors (Hagedorn, Maxwell, Cypers, Moon, & Lester, 2007).

Among early intake activities, the role of academic advising in particular has been connected to student persistence (King, 1993; Young, Backer, & Rogers, 1989), even as relatively few studies have presented empirical evidence supporting these claims (Bailey & Alfonso, 2005). What evidence we do have is in fact sparse and largely based on student perceptions of the quality of advising (Elliott & Healy, 2001; Metzner, 1989; Metzner & Bean, 1987) and frequency of advising sessions (Shields, 1994; Swecker, Fifolt, & Searby, 2013) rather than the nature and scope of issues addressed and tasks completed during advising sessions. Furthermore, most studies come from the context of four-year institutions where the overall intake process differs dramatically from the community college sector where students often sign up within weeks or days of the first class sessions sometimes without prior contact with the college. Without a more nuanced understanding of advising and its role during the overall intake process than what the current research affords, community college practitioners are limited in knowing how and when to most effectively deploy scarce advising resources.

Thus, the purpose of this study is to understand how different kinds of advising activities during the first three weeks for community college students who enroll for the first time relate to their intentions to re-enroll.

LITERATURE REVIEW

Operationalizing Academic Advising in Persistence Studies

Academic advising has been proposed as among some of the most impactful interventions for mitigating early community college student departure (King, 1993). King (1993) reasoned that because “academic advising is the only structured service on our [community college] campuses that guarantees students some kind of interaction with concerned representatives of the institutions” (pp. 21-22), it may be the most critical college support service.

Some researchers (Creeden, 1990; Crookston, 1972; O’Bannion, 1994) have for decades conceptualized advising as various activities along a prescriptive–developmental continuum (see Alexitch, 2013 for review). Whereas prescriptive advising is informational, directive, and unidirectional, developmental advising—largely seen as preferable to prescriptive approaches—entails a collaborative advisor–student relationship with the goal of developing independence and decision-making skills. Though evidence shows that for some students developmental advising is related to student autonomy in addition to greater persistence and academic achievement (Frost, 1995; Gallagher & Allen, 2000), there is also evidence that not all students desire or need such in-depth advising and that student preferences vary depending on personal circumstances and previous experience (Alexitch, 2013).

The impact of advising generally on student outcomes, including persistence, is seemingly well established. But there is relatively little empirical evidence for the link. Much of the research is now dated, going back to the 1980s and 1990s. Additionally, few studies are specific to the community college sector, leading us to review studies from all sectors. Some of the most commonly cited sources are scholarly or conceptual reviews of advising theory and practice, such as Creamer’s (1980) oft-cited seven propositions for advising and student retention practices, E. M. Webb’s (1987) suggestions for student affairs personnel, and Habley’s (1981) advisement–retention model, which proposed that quality academic advising affirms students’ decisions to persist.

Based on this conceptual or hypothetical role of advising in fostering student success, including persistence, another group of studies have investigated the perceptions of students and institutional actors, but without testing the relationship with persistence outcomes. Elliott and Healy (2001) conducted a study in which students rated the perceived importance of, and their satisfaction in, eleven areas of campus life—including advising. Although academic advising received the highest average importance and satisfaction score, advising was not found to be significantly related to overall satisfaction. Beal and Noel’s (1980) study of both two- and four-year institutions found that inadequate academic advising was ranked first by institutional

representatives as a cause for lowering student retention. Habley, Valiga, McClanahan, and Burkum (2010) found that community college institutional survey participants viewed academic advising centers and faculty advising training as two of the practices that most contribute to improving retention.

Research that does empirically test the link between advising and persistence tends to rely on one of three operationalizations: either dichotomous measures of participation, student perceptions of quality, or frequency of advising sessions. For instance, dichotomous coding can be seen in Young and colleagues' study (1989) that found that freshman participants in an early advising program had higher GPAs and lower attrition rates than nonparticipants. Seidman (1991) used a rare random-assignment experiment of the impact of a pre- and post-admissions/counseling process at a community college to find that whereas there was no significant relationship between participation and second semester registration, participants were more likely to register for a third semester. Bahr (2008) used a sophisticated event history analysis of a very large, longitudinal data set to test the controversial hypothesis that advising has a "cooling out" effect of discouraging students to pursue their academic ambitions. He presents compelling evidence that advising in fact is beneficial to students' chance of successful remediation completion and transfer, two outcomes that necessitate persistence. Still, the advising itself is operationalized in the model as having occurred or not during a given term. Bahr encouraged inquiry into the manner and type of advising offered.

Metzner and Bean (1987) measured, via Likert-scale survey items, students' perceptions of the degree of advisor concern and the quality of advising. Through a path analytical study of nontraditional student attrition, they found that the quality of academic advising had a significant and direct negative effect on dropout. Later, Metzner (1989) dichotomized the perception of advising quality to determine differential effects of high-quality versus low-quality advising and found that though neither was directly related to dropout, the indirect effects of high quality advising on dropout were significant and negative, as mediated through GPA, satisfaction, utility, and intent to leave the university. Shields (1994), and more recently Swecker et al. (2013), found that the frequency of seeing an advisor was the variable among other background characteristics with the largest significant association with enrollment status for nontraditional students (in the former study) and first-generation students (in the latter study). Lastly, in conceptual terms, Braxton, Duster, and Pascarella (1988) used an operationalization unique to the literature. These authors took into account the extent to which students experienced multiple dimensions of advising activities and combined them into a factor score that was found to be positively related to freshman persistence indirectly through academic integration and institutional commitment. In the literature to date on college persistence, the proposed two-dimensional

conceptualization of advising along a prescriptive–developmental continuum described above (Alexitch, 2013) has not been operationalized despite its prominence in the advising literature.

Collectively, these studies provide empirical evidence of the commonly accepted role of advising in community college and nontraditional student success. But the operationalization of what constitutes advising in these studies—with the exception perhaps of Braxton et al. (1988)—precludes more nuanced understanding of which forms of advising are associated with persistence and persistence intentions. Given the resources and institutional commitment that community colleges seek to marshal for advising in order to foster higher levels of persistence from the outset, it is imperative to further unpack the nature of advising activities and their relationship to persistence decisions.

Persistence, Goals, and Intent to Persist

Student persistence is notoriously challenging to study, especially in the community college sector, for at least two reasons. First, relatively few data sets provide sufficient information at all on student-level experiences and pathways through community colleges, and secondly, persistence data—like other student success measures in community colleges—mean little without corresponding information about students' goals (Goldrick-Rab, 2010). Students enter community college with myriad and often overlapping purposes, whether to complete an associate's degree, to transfer, or both, or just as often to take only single courses as needed for transfer credit at another institution where they are contemporaneously enrolled, for personal enrichment, obtaining specific skills, or for the sake of exploring interests and opportunities, among other purposes (Center for Community College Student Engagement [CCCSE], 2004; Clagett, 1989). Without taking into account student goals, attempts to understand student persistence leads to poor empirical findings for research and practice (Polinsky, 2003). Abundant research has shown that the influences of student integration and involvement on persistence decisions is mediated by goal and institutional commitments, either because those commitments lead to greater integration or vice-versa, depending on the situation (Pascarella & Terenzini, 2005; Tinto 1975). Thus, goals are held to be central to both measuring persistence and understanding factors that may influence it (Goldrick-Rab, 2010; Polinsky, 2003).

The challenge with using goals as a way to understand student persistence decisions is that few data sources contain reliable information about goals or institutional commitment, limiting empirical evidence of the link. As an alternative, researchers have for decades studied students' intentions to persist, going back to fundamental studies by Spady (1970), Tinto (1975), Pascarella and Terenzini (2005), and others. Bean (1982) provided some of the first evidence that intent to leave is among the best predictors of actual

student attrition, and studies over the years have confirmed the finding (Bers & Smith, 1991; Cabrera, Nora, & Castañeda, 1993; Davidson, Beck, & Milligan, 2009; Luke, Redekop, & Burgin, 2015; Voorhees, 1987). Research in community colleges has shown that academic goals are relatively stable for most students—close to 80% by some measures; however, when they do change it is largely a function of experience and previous interactions within institutions (Voorhees & Zhou, 2000). The question remains, however, how early college experiences begin to influence persistence intentions, and the role of advising in the process. This is particularly important in relation to students who are less prepared or from traditionally underserved minority groups who may encounter multiple barriers to persistence that advising is designed to mitigate (Museus & Quaye, 2009).

Student Engagement as a Framework to Contextualize Advising

To frame persistence studies, researchers in the two-year college sector, as in higher education research generally, have largely used a trio of interrelated interactionist frameworks: integration (Tinto, 1975, 1993), involvement (Astin, 1984), and engagement (Kuh, 2001a), in addition to Bean and Metzger's (1985) influential model of nontraditional student attrition. An important principle underscoring all of these conceptual models, and even more relevant to criticisms regarding some of their culturally-narrow assumptions (Museus & Quaye, 2009; Nora, 2003; Rendón, Jalomo, & Nora, 2000; Stuart, Rios-Aguilar, & Deil-Amen, 2014), is that persistence is the result of the interaction of individual, institutional, and external factors. As expressed in some publications (e.g., Astin & Antonio, 2012; Lester, Leonard, & Mathias, 2013; Sáenz et al., 2011), this leads to the conclusion that the various terms of involvement, integration, and engagement are effectively interchangeable. However, a closer look (Wolf-Wendel, Ward, & Kinzie, 2009) reveals that whereas conceptualizations of involvement and integration involve primarily what students do, and therefore have implications *for* institutional action, engagement *comprises* institutional action—encompassing what institutions do, not just indicating what they should do. Indeed, engagement is defined as having two key components:

The first, is the amount of time and effort students put into their studies and other activities that lead to the experiences and outcomes that constitute student success. The second is the ways an institution allocates its human and other resources and organizes learning opportunities and services to encourage students to participate in and benefit from such activities. (Kuh, Kinzie, Schuh, & Whitt, 2005, p. 9)

Thus, engagement is conceptually a joint phenomenon of how students engage with and simultaneously are engaged by the college environment and personnel (McCormick, Kinzie, & Gonyea, 2013). In this way, the dual nature

of an engagement framework fits well with a two-dimensional model of advising, described above, since the prescriptive–developmental continuum of advising activities also distinguishes between endeavors that are individually- or mutually-driven. In this study, we conceptualize advising as among many forms of how students engage with and are engaged by the institution during their first three weeks of college.

The literature on engagement in the two-year sector covers many of the concerns of engagement at the four-year sector. Authors have considered, for instance, the conceptual and historical development of the Community College Survey of Student Engagement (CCSSE) instrument and issues of validity (Angell, 2009; Marti, 2009; McClenney, 2004, 2007) including alternative engagement conceptualizations derived from CCSSE data (Nora, Crisp, & Matthews, 2011; Schuetz, 2008); strategies for building an institutional culture of engagement (McClenney & Greene, 2005) and for engaging community college transfer students (Wood & Moore, 2015); relative levels of student-faculty interaction for students from different ethnic and racial backgrounds (Chang, 2005); the role of student-faculty interaction that affect the success of African American male community college students (Wood & Turner, 2010); the paradoxical gap between engagement levels and academic outcomes that many African American and Hispanic community college students experience (Greene, Marti, & McClenney, 2008); and the gap between faculty expectations and student perceptions (Dudley, Liu, Hao, & Stallard, 2015).

Engagement and Persistence

In the higher education literature overall, several studies to date have shown evidence that higher levels of engagement are positively associated with greater persistence, but that evidence does not distinguish types of advising activities among many other kinds of student-institutional interactions. Much of the research comes from the four-year sector. Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008; cf. Kinzie, Gonyea, Shoup, & Kuh, 2008; Nelson Laird, Chen, & Kuh, 2008) used data from NSSE at 18 four-year universities to examine the influence of engagement during the first year of college on GPA and second year persistence. Controlling for background characteristics, financial aid, academic achievement, and other college experiences, the authors found engagement had a positive, significant relationship with both outcomes. Hu (2011), using survey data gleaned from the Washington State Achievers program, which tracked high school students through their enrollment in colleges and universities throughout the state, found that although a higher level of social engagement was positively associated with persistence, higher levels of academic engagement on its own was in fact negatively related, unless accompanied with a high level of social engagement. Hu attributed this non-linear relationship to qualitative differences in the

kinds of engagement profiles of some students who devote a good amount of effort to academics but little else to other college activities. Hu highlighted this finding as an example that more engagement is not necessarily better and cautioned researchers to consider types, not just levels, of engagement.

Studies linking engagement and persistence, in particular, in community colleges are relatively limited, with just a handful of studies that investigate the link empirically. Hawley and Harris (2005) found that psychosocial factors, including engagement—conceptualized as the degree of involvement or integration according to Astin's (1984) and Tinto's (1975) theories—were among the student-level variables that successfully predicted fall-to-fall persistence in a large metropolitan community college. McClenney, Marti, and Adkins (2006; cf. McClenney, 2007) concluded in their validation study of CCSSE that the types of engagement most closely associated with persistence were student effort and support—both academic and social—for learners, the latter including perceptions of institutional support and the use of advising and counseling services. Conversely, Roman, Taylor, and Hahs-Vaughn, (2010) found little evidence for a relationship between engagement and retention rates in Florida community colleges, though institutional-level aggregation of the data may have obscured a correlation. None of these studies distinguished types of advising among many engagement activities.

METHODOLOGY

Data Source and Sample

Data used for this study come from the 2010 Survey of Entering Student Engagement (SENSE) administered by CCCSE (2007, 2010). SENSE, similar to CCCSE's flagship Community College Survey of Student Engagement, is designed to capture both student behaviors and institutional practices that affect students but by focusing on the earliest weeks of college that can be critical to setting a foundation for success. It is administered before the end of the third week of the fall academic term. Participants come from classes sampled randomly from among all developmental reading, writing, and math courses (excluding ESL) and from first college-level English and math courses. In 2010, 13 colleges administered an optional special-focus module on intensive academic advising activities. CCCSE provided an 80 percent random sample of student responses from these 13 colleges, from which we selected only those students new to college and not co-enrolled elsewhere ($n = 3,956$). In order to obtain comparable nested models for our analyses, described below, we restricted the data set to those observations ($n = 2,856$) with non-missing values for all variables in the full model.

Because the sampling frame is at the class level, and full-time students are more likely to be enrolled in any sampled class, part-time students are

underrepresented. To correct for this selection bias, we applied CCCSE-provided sampling weights derived from enrollment data in the Integrated Postsecondary Education Data System (IPEDS). Unless noted, all statistics are weighted using these figures and reported as rounded values.

Variables

The dependent variable came from the survey item asking “When do you plan to take classes at this college again?” to which there were four responses: (1) “I will accomplish my goal(s) this semester/quarter and will not be returning” (5.1%, $n = 141$); (2) “I have no current plans to return” (1.7%, $n = 46$); (3) “Within the next 12 months” (72.3%, $n = 1983$); and (4) “Uncertain” (20.9%, $n = 574$). Though it may be possible to reduce these response options to a dichotomous or trichotomous coding scheme to simplify analysis, we opted to use all four options in our analytical models to capture important nuances in community college students’ intentions. For instance, many students enroll for purposes beyond graduation and transfer, such as to gain practical skills, to test the waters of college, or to earn transferable credit, while others are simply unsure (Bailey, Leinbach, & Jenkins, 2006; Voorhees & Zhou, 2000; Wood & Moore, 2015).

The independent measures represented three areas informed by the literature and our selected framework: 1) characteristics related to a student’s personal background; 2) variables that bridge an individual’s circumstances and insertion into the college environment; and 3) theory-specific engagement factors. Descriptive statistics for these variables for our sample are shown in Table 1.

Student background characteristics. Research on persistence in community college settings, even if limited, has been published for several decades, going back to studies by Bers (1988), Halpin (1990), Pascarella, Smart, and Ethington (1986), Voorhees (1987), and M. W. Webb (1988, 1989). Based on these and subsequent articles that established the salience of various student background factors in terms of student persistence and college retention, tempered by data availability and parsimony, we included variables operationalizing students’ race/ethnicity (Cabrera, Castañeda, Nora, & Hengstler, 1992; Grimes & Antworth, 1996; Strayhorn, 2012; Wood, 2012), gender (Grimes & Antworth, 1996; Pascarella & Terenzini, 2005), age (D’Amico, Morgan, & Rutherford, 2011; Nakajima, Dembo, & Mossler, 2012), English proficiency (Nakajima et al., 2012), high school grades (Feldman, 1993; Kuh et al., 2008), and generation status (i.e., education level of parents; Fike & Fike, 2008).

Student bridge variables. Students have unique characteristics that arise due to their entry into a college, shaped by their background circumstances and the particular activities and programs offered by the institution. Such bridge factors come about as a result of the person’s insertion into the micro- and meso-system of the institution (Bronfenbrenner, 2005) upon pursuing

TABLE 1
DESCRIPTION OF INDEPENDENT VARIABLES (WEIGHTED*) FOR STUDENT RESPONDENTS (N = 2856)

<i>Variable</i>	<i>Definition/Coding</i>	<i>M</i>	<i>SD</i>
<i>Student background characteristics</i>			
American Indian, Native American, or Other	Dummy coded, reference (0) = White, Non-Hispanic	0.07	0.24
Asian, Asian American, Pacific Islander, or Native Hawaiian	Dummy coded, reference (0) = White, Non-Hispanic	0.04	0.20
Black or African American, non-Hispanic	Dummy coded, reference (0) = White, Non-Hispanic	0.13	0.33
Hispanic, Latino, Spanish	Dummy coded, reference (0) = White, Non-Hispanic	0.19	0.38
Gender	1 = male, 0 = female	0.45	0.49
Traditional/nontraditional age students	1 = nontraditional age student (25 and older), 0 = traditional age student (24 and younger)	0.20	0.39
English first language	Is English your native language? 1 = no, 0 = yes	0.15	0.35
High school grades	Range of overall high school grade average		
Parents education	5 = A, 4 = A- to B+, 3 = B, 2 = B- to C+, 1 = C, 0 = C- or lower	2.56	1.22
Hours worked	1 = first-generation (neither parent attended college), 0 = not first-generation (at least one parent attended college) Hours spent in a typical 7-day week working for pay during first three weeks of enrollment, 1 = none, 2 = 1-5 hours, 3 = 6-10 hours, 4 = 11-20 hours, 5 = 21-30 hours, 6 = more than 30 hours	0.42	0.48
<i>Student factors within academic environments</i>			
Goal: seeking neither credential nor transfer	Dummy coded, reference (0) = Goal: seeking a credential (certificate and/or degree)	3.18	1.97
Goal: seeking transfer only (no credential)	Dummy coded, reference (0) = Goal: seeking a credential (certificate and/or degree)	0.01	0.11
When registered for classes	When students registered, -2 = more than one week before classes began, -1 = during the week before classes began, 0 = during the first week of classes, 1 = after the first week of classes	0.14	0.34
		-1.83	0.45

Enrollment intensity*	Enrollment status, 1 = part time, 0 = full-time	0.57	0.49
Developmental status	1 = enrolled in at least one developmental course, 0 = not enrolled in developmental courses	0.65	0.47
Received financial aid	Received financial assistance funds before classes began, 1 = yes, 0 = no	0.56	0.49
Attended online or on campus orientation prior to the beginning of classes	Dummy coded, reference (0) = did not indicate participation in any orientation program	0.64	0.47
Enrolled in an orientation course during first term	Dummy coded, reference (0) = did not indicate participation in any orientation program	0.04	0.20
<i>Engagement factor scales**</i>			
Academic and social support network	Factor scale of 8 items, range of 0 to 1	0.80	0.13
Present and on task	Factor scale of 4 items, range of 0 to 1	0.86	0.15
Clear academic plan and pathway	Factor scale of 5 items, range of 0 to 1	0.58	0.21
Skills training	Factor scale of 3 items, range of 0 to 1	0.70	0.19
Speaking up	Factor scale of 5 items, range of 0 to 1	0.39	0.20
Ancillary instruction	Factor scale of 3 items, range of 0 to 1	0.14	0.19
Collaboration	Factor scale of 3 items, range of 0 to 1	0.10	0.18
Intensive advising	Factor scale of 11 items, range of 0 to 1	0.53	0.21

*SENSE respondents came from sampled courses, resulting in a bias for full-time students who are more likely to be enrolled. Regression analyses were statistically weighted using college PT/FT ratios.

**Engagement factor scores were standardized before running regression analyses so that coefficients would represent effect sizes in terms of standard deviation changes.

college coursework. Foremost among bridge variables are academic goals, which have been shown to have close relationships to persistence (Bers & Smith, 1991; Grosset, 1991; Martin, Galentino, & Townsend, 2014; Polinsky, 2003). National data show the majority of community college students start college with the goal of obtaining some kind of credential, whether a certificate or associate degree (CCCSE, 2012). For this reason, we coded this as the reference for two dummy-coded variables in order to control for the effect of having less common but equally valuable goals. Other bridge variables we included were whether a student enrolls part- or full-time, enrolls in at least one developmental course, and/or uses financial aid (Berger & Milem, 1999; Cheng, Ickes, & Verhofstadt, 2012; D'Amico et al., 2011; Fike & Fike, 2008; Kuh et al., 2008; McKinney & Novak, 2013). In terms of college intake procedures, we accounted for when students registered for classes (Hale & Bray, 2011; Smith et al., 2002) and whether a student participated in an orientation program or an extended orientation course or neither (Derby & Smith, 2004; Glass & Garrett, 1995; Kuh, Kinzie, Schuh, & Whitt, 2010).

Student engagement factors. The SENSE instrument operationalizes engagement activities in which students and institutions jointly engage. CCCSE (2010) has proposed six SENSE benchmarks, or scales, of engagement for institutional improvement. However, unlike the NSSE and CCSSE benchmarks (McCormick, Kinzie, & Gonyea, 2013) they are patterned on, there are no available validation studies for SENSE benchmarks, and our addition of relatively fine-grained advising activities calls for a re-examination of the scales for this particular study. Thus, in order to reduce the data for our modeling purposes, we conducted an exploratory factor analysis of the 58 items composing the SENSE benchmarks (CCCSE, 2010) together with the 12 advising special-focus items. We used a principle axis extraction method with a promax rotation to identify latent factors of engagement. We ultimately excluded 16 items from the factor analysis because either (a) an item was peripheral to the joint student-institutional construct of engagement, such as college policy or procedures (e.g., requiring placement testing or requiring enrollment in placed courses); (b) an item was not expected to be intercorrelated with latent factors of engagement in the first place (e.g., “[Using] an electronic tool ...to communicate with an instructor about coursework;” see McCormick & McClenney, 2012); (c) items formed only problematic doublet factors; or (d) an item simply did not load on any factor and was not interpretable in terms of an emergent factor structure.

The SENSE instrument, like many measures in the social sciences, relies on Likert scales. Despite the widespread use of Pearson product-moment correlations to obtain factor solutions for Likert scale data, statisticians have shown that they are typically inappropriate for this task due to their categorical nature. Pearson correlations assume interval scales and their application to

categorical ordinal data results in biased estimates of correlation, suppressed factor loadings, and consequently incorrect numbers and composition of derived factors. Skewed response distributions, typical of Likert response data, compound these problems by resulting in factors unduly influenced by response patterns. Thus, statisticians recommend using a polychoric correlation matrix instead (Holgado-Tello, Chacón-Moscoso, Barbero-García, & Vila-Abad, 2010; Olsson, 1979). Polychoric correlation estimates, among the earliest of Karl Pearson's innovations, but largely overlooked today, are estimates of the linear correlation of latent variables measured categorically. Many software packages will estimate a polychoric correlation matrix, either in the process of factor analysis, or as a separate step. With the matrix in place, the factor extraction proceeds in a familiar fashion.

The scree plot of eigenvalues and the Kaiser-Guttman cutoff guideline suggested as few as four factors, whereas Velicer's minimum average partial (MAP) test (Costello & Osborne, 2005; O'Connor, 2000) indicated nine or ten factors. We inspected factor solutions throughout this range and settled on eight-factors as the most parsimonious and interpretable solution. We labeled the factors: (1) academic and social support, (2) independent learning, (3) clear academic plan and pathway (the same wording used by CCCSE since the items were the same as the SENSE benchmark), (4) skills training, (5) dialogue and feedback, (6) ancillary instruction, (7) collaboration, and (8) intensive advising. Factor scale reliability and item loadings are shown in Table 2. Three of these scales had reliability coefficients below what is considered good reliability (< 0.7). However, because early college engagement is an unexplored research area and Cronbach's alpha is not always a useful metric of unidimensionality (Lance, Butts, & Michels, 2006; Sijtsma, 2009), we included these factors as they are conceptually appropriate and well within the range for NSSE and CCSSE engagement scales reported in the literature (Kuh, 2001b; Marti, 2009; Nelson Laird & Kuh, 2005). For item loadings, we used the traditional cutoff of 0.3 (Tabachnick & Fidell, 2012), though only four variable loadings were below 0.5. Factor scores were calculated for each respondent and standardized prior to running the analyses to allow for their interpretation as effect sizes (Cohen, J., Cohen, P., West, & Aiken, 2003).

Analyses

This study employs multinomial logistic regression to examine the relative relationship of new students' persistence intentions in the first three weeks of college in relation to engagement factors—with a particular focus on advising activities. Multinomial logistic regression allows for simultaneous estimation of binary logit models for all possible comparisons among unordered outcomes, and the ability to calculate odds ratios for each (Jones-White, Radcliffe, Huesman Jr, & Kellogg, 2010; Long, 1997; Porter, 2003). We selected the third of four responses, “[I plan to reenroll] within

TABLE 2.
ITEMS COMPRISING FACTOR SCALES

<i>Factors and Items</i>	<i>Definition/Coding</i>	<i>Loadings</i>
<p>1. <i>Academic and social support</i> ($\alpha = 0.83$)</p> <p>The instructors at this college want me to succeed</p> <p>All instructors clearly explained academic and student support services available at this college</p> <p>All instructors clearly explained course grading policies</p> <p>All instructors clearly explained course syllabi (syllabuses)</p> <p>I knew how to get in touch with my instructors outside of class</p> <p>At least one other student whom I didn't previously know learned my name</p> <p>At least one instructor learned my name</p> <p>I learned the name of at least one other student in most of my classes</p>	<p>Agreement scale: 1 = Strongly disagree, 2 = Disagree, 3 = No opinion, 4 = Agree, 5 = Strongly agree</p> <p>Same as above</p> <p>Same as above</p> <p>Same as above</p> <p>Same as above</p> <p>Same as above</p> <p>Same as above</p> <p>Same as above</p>	<p>0.46</p> <p>0.48</p> <p>0.81</p> <p>0.87</p> <p>0.77</p> <p>0.72</p> <p>0.75</p> <p>0.75</p>
<p>2. <i>Independent learning</i> ($\alpha = 0.61$)</p> <p>Turn in an assignment late (reverse coded)</p> <p>Not turn in an assignment (reverse coded)</p> <p>Come to class without completing readings or assignments (reverse coded)</p> <p>Skip class (reverse coded)</p>	<p>Frequency scale: 1 = Never, 2 = Once, 3 = Two or three times, 4 = Four or more times</p> <p>Same as above</p> <p>Same as above</p> <p>Same as above</p>	<p>0.65</p> <p>0.72</p> <p>0.60</p> <p>0.50</p>
<p>3. Clear academic plan and pathway ($\alpha = 0.82$)</p> <p>I was able to meet with an academic advisor at times convenient for me</p> <p>An advisor helped me to select a course of study, program, or major</p> <p>An advisor helped me to set academic goals and to create a plan for achieving them</p>	<p>Agreement scale: 1 = Strongly disagree, 2 = Disagree, 3 = No opinion, 4 = Agree, 5 = Strongly agree</p> <p>Same as above</p> <p>Same as above</p>	<p>0.54</p> <p>0.82</p> <p>0.74</p>

<p>An advisor helped me to identify the courses I needed to take during my first semester/quarter A college staff member talked with me about my commitments outside of school (work, children, dependents, etc.) to help me figure out how many courses to take</p>	<p>Same as above Same as above</p>	<p>0.76 0.38</p>
<p>4. <i>Skills training</i> ($\alpha = 0.85$) Within a class or through another experience at this college, I learned to improve my study skills (listening, note taking, highlighting readings, working with others, etc.) Within a class or through another experience at this college, I learned to understand my academic strengths and weaknesses Within a class or through another experience at this college, I learned skills and strategies to improve my test-taking ability</p>	<p>Agreement scale: 1 = Strongly disagree, 2 = Disagree, 3 = No opinion, 4 = Agree, 5 = Strongly agree Same as above Same as above</p>	<p>0.83 0.84 0.82</p>
<p>5. <i>Dialogue and feedback</i> ($\alpha = 0.68$) Ask questions in class or contribute to class discussions times Discuss an assignment or grade with an instructor Ask for help from an instructor regarding questions or problems related to a class Receive prompt written or oral feedback from instructors on your performance Discuss ideas from readings or classes with instructors outside of class</p>	<p>Frequency scale: 1 = Never, 2 = Once, 3 = Two or three times, 4 = Four or more Same as above Same as above Same as above Same as above</p>	<p>0.50 0.66 0.69 0.53 0.31</p>
<p>6. <i>Ancillary instruction</i> ($\alpha = 0.53$) Participate in supplemental instruction (extra class sessions with an instructor, tutor, or experienced student) Frequency of use: Face-to-face tutoring Frequency of use: Writing, math, or other skill lab</p>	<p>Frequency scale: 1 = Never, 2 = Once, 3 = Two or three times, 4 = Four or more times Same as above Same as above</p>	<p>0.65 0.74 0.45</p>
<p>7. <i>Collaboration</i> ($\alpha = 0.71$) Work with classmates outside of class on class projects or assignments times Participate in a required study group outside of class Participate in a student-initiated (not required) study group outside of class</p>	<p>Frequency scale: 1 = Never, 2 = Once, 3 = Two or three times, 4 = Four or more Same as above Same as above</p>	<p>0.80 0.73 0.83</p>

Table 2, cont.

Factors and Items	Definition/Coding	Loadings
8. <i>Intensive advising</i> ($\alpha = 0.91$)	Agreement scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree	0.60
A college staff member spent enough time with me to help me understand the process of enrolling in and attending this college.	Same as above	0.56
A college staff member clearly explained how my placement test scores were used to determine if I was ready for college-level courses or needed to take courses to help me become college ready.	Same as above	0.76
A college staff member helped me to design a course sequence that showed how long it would take to attain my educational goals.	Same as above	0.77
A college staff member clearly explained core courses and other requirements for completing a certificate/degree, or for transferring to another college/university.	Same as above	0.82
A college staff member talked with me about the importance of completing a certificate or degree.	Same as above	0.80
A college staff member clearly explained to me where to find help if I were considering dropping out of or withdrawing from college.	Same as above	0.77
A college staff member clearly explained consequences of receiving poor grades (academic probation, potential loss of financial assistance or scholarships, etc.).	Same as above	0.63
A college staff member helped me to understand approximately how many hours outside of class (per week) I need to spend preparing and studying for each course I am taking.	Same as above	0.78
A college staff member helped me to understand whether my selected major or career is in a high-demand occupation/field (a field in which numerous jobs are expected to be available).	Same as above	0.79
A college staff member helped me to understand how much money I am likely to earn through a job in my selected major/career field.	Same as above	0.77
A college staff member helped me to understand where (geographic location) I am likely to find employment in my selected major/career field.	Same as above	0.77

the next 12 months,” as the reference category and regressed the outcome comparisons (“I will accomplish my goal(s) this semester/quarter and will not be returning,” “I have no current plans to return,” and “Uncertain”) on the independent variables. We used SAS (version 9.4) PROC GLIMMIX to carry out the analyses. We entered the variables in three blocks noted above in order to determine whether additional variables significantly improve model fit and to check for any notable increases or decreases in coefficient values in light of additional control variables. We checked for multicollinearity issues to ensure a parsimonious model at each step and overall. Because logistic regression does not yield *r*-square statistics, we relied on likelihood ratio tests for each block added.

Limitations

This study, like all research, has its share of limitations that must be considered in interpreting results. Foremost, although the intent to persist has been shown to be predictive of actual persistence, it is not a directly measured outcome, and indeed intentions may well change over time or abruptly. This feature of the study presents another limitation of the study. Though the survey administration provides perspective concerning the critical and understudied early phase of the college experience, the data are nonetheless cross-sectional, thus causal implications rely on theory or inference. This limitation may be acceptable in light of the purpose of the study to understand in greater detail some of the nuanced relationships among early engagement and intentions, and so suggest causal relationships for further study. Additional limitations are that the survey instrument was designed to ascertain engagement and not intentions, and so more detailed information about persistence intentions was not available. The data are self-reported which make them subject to validity concerns (Porter, Rumann, & Pontius, 2011). However, researchers have demonstrated that there is value in using student perceptions of their own effort vis-à-vis institutional commitment (Pike, 2013), and this kind of data is especially suitable in this case where we are investigating intentions that only students themselves can provide (Gonyea, 2005). In terms of representativeness, the data may have limited generalizability since SENSE colleges are self-selected, and colleges that administered the advising special focus module have per se an institutional interest in this activity. Nonetheless, there are a variety of sizes and settings among the 13 colleges, which came from five different accrediting regions; served urban, suburban, and rural communities; and enrolled from 2,206 to 15,547 students ($M = 7,084$, $SD = 4,919$).

Given the nested nature of the data and the notion that intake process may vary in important ways across colleges, a multilevel model would be desirable to be able to partition the variance-covariance components into separate within- and between-institution effects (Astin & Denson, 2009; Raudenbush

& Bryk, 2002). We had 13 sites that, though less than the recommendation of some statisticians to have at least 20 level-two clusters (Bickel, 2007), led us to specifically turn to SAS PROC GLIMMIX for the very reason that it can technically implement multilevel multinomial logistic regression models with random effects. Unfortunately, even the null model with a random intercept did not converge, let alone more complex models, a problem that it turns out is not uncommon for multilevel nominal logistic regression (Wright, 1997). There are at least two considerations that attenuate this limitation, however. The first is that unless a research design is temporal in nature (which our data set unfortunately does not allow) or the research question involves testing cross-level effects (which is not suggested in this case by the theory or previous literature), multi-level regression ultimately may be unnecessary (Astin & Denson, 2009). The second is that even if the models had converged, simulation studies of survey data suggest that estimates of variance-covariance components of multilevel logistic regression may be biased with as few as 100 groups (Moineddin, Matheson, & Glazier, 2007), which would thus preclude a multilevel analysis of this particular data set.

RESULTS

Results of the multinomial logistic models are reported in Table 3, 4, and 5, representing the addition of each block of independent variables. For the sake of interpretation, the regression coefficients have been converted from their logarithmic scale to odds ratios. Nonetheless, the meaningful interpretation of multinomial logistic regression remains a challenge since there are multiple sets of comparisons of outcome response options for a single model. In this paper, each single model has three sets of comparisons, arranged in columns that can be consulted singly or collectively to determine which independent variables are related to significantly higher or lower odds of a student having responded one way or another regarding persistence intentions.

Odds ratios should not be mistaken for probability or likelihoods. Rather, as the name suggests, odds ratios represent a comparison of two separate values—namely the comparison of odds for a unit increase in a given predictor variable. An odds ratio of 1 means that an outcome is equally likely regardless of the status of a predictor variable (that is, the odds do not change with a unit increase and the same value is in the numerator and the denominator). Odds ratios that are greater or less than 1 reflect an increase or decrease in the odds associated with a change in the predictor variable. So for instance: the data show that part-time enrolled students have higher odds of reporting uncertainty of future enrollment. Dividing the relatively higher odds of uncertainty for part-time students (coded as 1) by the odds for full-time students (coded as 0) yields a ratio larger than 1. In this case (Table 5, third column) we see that those odds happen to be 1.25 times,

or said another way 25 percent, higher. For a primer on interpreting odds ratios in applied research, we refer readers to DesJardins's (2001) excellent non-technical overview in the Association for Institutional Research (AIR) Professional File series. To make sense of the results, we encourage readers to consult Tables 3, 4, and 5 side by side, and compare corresponding columns across the models to track individual outcome comparisons vis-à-vis independent variables.

Overall, the contribution of additional sets of variables significantly improved model fit with the step to Model 2 ($\Delta-2LL = 96.7$, critical X^2 value = 51.2, $df = 24$) and to Model 3 ($\Delta-2LL = 89.9$, critical X^2 value = 51.2, $df = 24$). Model 1 and Model 2 serve to control for important background and bridge variables before considering the engagement variables of interest in Model 3. But some variables were significantly related to persistence intentions in ways that deserve consideration in order to interpret advising and engagement factors.

Student Background Characteristics

In terms of student background characteristics, the most prominent finding in numeric terms—relative to the odds ratios across all independent variables—is the magnitude of the increased odds to have no current plans to return for students that identify as Asian, Asian American, Pacific Islander, or as Black or African American. For both student groups, as seen in the first column for all three models (Tables 3, 4, and 5), the odds of having stated they will accomplish their goal(s) in the current term and not return are more than three times higher than their White peers, all else being equal. For Black and African American students, the significant and relatively large odds ratios apply across all three outcome comparisons in all three models. In the final model (Table 5), the odds are 3.29 times higher ($p < .001$) they would have indicated they will accomplish their goal(s) and not return (first comparison), 2.99 times higher ($p < .01$) to simply have no plans to return (second comparison) and 1.49 times higher ($p < .051$) of being uncertain (third comparison). Hispanic and Latino students on the other hand, as seen in the middle column of the final model, have odds 94% lower than their White peers (odds ratio = 0.06, $p < .05$) to have no current plans to return. Furthermore, their odds of having responded uncertain (third column) or accomplishing their goals in the current term (first column) ended up being not significant in the final model, even though the odds in these two comparisons were significantly higher in Model 1 before adding bridge and engagement variables. Some of these odds ratios may not actually be as high as they seem; the limited instances of responses in some instances lead to large confidence intervals (CIs). Nonetheless, even if on the low end of CIs, these relationships suggest important differences in experiences among different racial and ethnic groups indicative of broader structural issues (Crisp & Nora, 2010; Museus & Quaye, 2009).

TABLE 3
ODDS RATIOS OF ENTERING STUDENTS' PLANS TO RETURN IN
FIRST WEEKS AT COLLEGE,
CONDITIONAL ON STUDENT BACKGROUND CHARACTERISTICS

<i>Variable</i>	<i>Model 1: Conditional on Student Background Characteristics</i>		
	<i>1 vs. 3</i> <i>Will accomplish my</i> <i>goal; not return</i> <i>vs.</i> <i>Return within the</i> <i>next 12 months</i> <i>(95% CI)</i>	<i>2 vs. 3</i> <i>No current plans to</i> <i>return</i> <i>vs.</i> <i>Return within the</i> <i>next 12 months</i> <i>(95% CI)</i>	<i>4 vs. 3</i> <i>Uncertain</i> <i>vs.</i> <i>Return within the</i> <i>next 12 months</i> <i>(95% CI)</i>
American Indian, Native American, or Other	1.36 (0.62 – 2.96)	1.74 (0.64 – 4.76)	1.39 (0.95 – 2.02)
Asian, Asian American, or Pacific Islander	3.19 (1.49 – 6.81)**	2.53 (0.61 – 10.57)	1.08 (0.64 – 1.80)
Black or African American	3.36 (2.10 – 5.37)***	2.71 (1.28 – 5.72)**	1.47 (1.10 – 1.98)**
Hispanic, Latino, Spanish	1.75 (1.04 – 2.93)*	0.09 (0.01 – 1.33)	1.36 (1.03 – 1.80)*
Male	0.96 (0.68 – 1.38)	2.19 (1.17 – 4.12)*	1.33 (1.09 – 1.61)**
Nontraditional age	0.43 (0.25 – 0.74)**	0.25 (0.07 – 0.91)*	0.61 (0.47 – 0.81)***
English not first language	1.15 (0.67 – 1.96)	1.12 (0.33 – 3.79)	1.29 (0.96 – 1.75)
HS grades†	0.92 (0.80 – 1.07)	0.87 (0.68 – 1.12)	0.93 (0.86 – 1.00)
First generation	1.32 (0.91 – 1.90)	0.36 (0.16 – 0.80)*	1.05 (0.86 – 1.29)
Hours worked per week†	0.95 (0.87 – 1.04)	0.96 (0.82 – 1.13)	0.87 (0.83 – 0.92)***

*** $p < .001$; ** $p < .01$; * $p < .05$
† Ordered categories

TABLE 4
ODDS RATIOS OF ENTERING STUDENTS' PLANS TO RETURN IN
FIRST WEEKS AT COLLEGE, CONDITIONAL ON STUDENT BACK-
GROUND AND BRIDGE VARIABLES

Variable	Model 2: Addition of Student Bridge Variables		
	1 vs. 3 Will accomplish my goal; not return vs. Return within the next 12 months (95% CI)	2 vs. 3 No current plans to return vs. Return within the next 12 months (95% CI)	4 vs. 3 Uncertain vs. Return within the next 12 months (95% CI)
American Indian, Native American, or Other	1.33 (0.60 – 2.92)	1.62 (0.57 – 4.59)	1.35 (0.92 – 1.97)
Asian, Asian American, or Pacific Islander	3.71 (1.73 – 7.96)***	4.16 (1.00 – 17.22)*	1.16 (0.69 – 1.96)
Black or African American	3.33 (2.06 – 5.40)***	2.94 (1.34 – 6.48)**	1.44 (1.06 – 1.94)*
Hispanic, Latino, Spanish	1.64 (0.97 – 2.79)	0.08 (0.01 – 1.13)	1.26 (0.95 – 1.67)
Male	0.95 (0.66 – 1.36)	1.93 (1.00 – 3.71)*	1.32 (1.08 – 1.60)**
Nontraditional age	0.44 (0.25 – 0.77)**	0.28 (0.08 – 1.07)	0.61 (0.46 – 0.81)***
English not first language	1.07 (0.63 – 1.84)	1.01 (0.30 – 3.35)	1.21 (0.90 – 1.65)
HS grades†	0.93 (0.80 – 1.09)	0.85 (0.66 – 1.11)	0.95 (0.88 – 1.03)
First generation	1.35 (0.93 – 1.97)	0.40 (0.18 – 0.92)*	1.06 (0.86 – 1.30)
Hours worked per week†	0.95 (0.86 – 1.03)	0.98 (0.83 – 1.15)	0.87 (0.82 – 0.91)***
Neither credential nor transfer goal	6.97 (2.66 – 18.24)***	1.78 (0.21 – 15.11)	2.72 (1.23 – 6.02)*
Goal to transfer without credential	1.72 (1.08 – 2.76)*	2.35 (1.14 – 4.84)*	1.52 (1.16 – 1.99)**
When registered for classes†	1.05 (0.74 – 1.49)	0.70 (0.34 – 1.42)	1.12 (0.91 – 1.37)
Enrolled part time	1.23 (0.85 – 1.78)	1.32 (0.70 – 2.50)	1.28 (1.04 – 1.56)*
Enrolled in one or more develop. course	0.95 (0.64 – 1.40)	0.87 (0.46 – 1.64)	1.19 (0.96 – 1.47)
Received financial aid	0.96 (0.66 – 1.38)	1.85 (0.92 – 3.74)	1.20 (0.98 – 1.47)
Attended orientation on-campus or online	0.64 (0.44 – 0.93)*	0.13 (0.18 – 0.49)***	0.74 (0.60 – 0.91)**
Enrolled in orientation course	0.59 (0.23 – 1.51)	0.02 (0.02 – 1.30)	0.47 (0.27 – 0.82)**

*** $p < .001$; ** $p < .01$; * $p < .05$

† Ordered categories

TABLE 5
ODDS RATIOS OF ENTERING STUDENTS' PLANS TO RETURN IN
FIRST WEEKS AT COLLEGE, CONDITIONAL ON STUDENT BACK-
GROUND, BRIDGE VARIABLES, AND ENGAGEMENT

<i>Variable</i>	<i>Model 3: Addition of Engagement Factors</i>		
	<i>1 vs. 3</i> <i>Will accomplish my goal; not return</i> <i>vs.</i> <i>Return within the next 12 months</i> <i>(95% CI)</i>	<i>2 vs. 3</i> <i>No current plans to return</i> <i>vs.</i> <i>Return within the next 12 months</i> <i>(95% CI)</i>	<i>4 vs. 3</i> <i>Uncertain</i> <i>vs.</i> <i>Return within the next 12 months</i> <i>(95% CI)</i>
American Indian, Native American, or Other	1.36 (0.61 – 3.02)	1.09 (0.36 – 3.33)	1.35 (0.91 – 1.98)
Asian, Asian American, or Pacific Islander	3.28 (1.50 – 7.19)**	3.33 (0.77 – 14.46)	1.15 (0.68 – 1.96)
Black or African American	3.29 (2.01 – 5.38)***	2.99 (1.34 – 6.71)**	1.49 (1.10 – 2.02)*
Hispanic, Latino, Spanish	1.62 (0.96 – 2.75)	0.06 (0.00 – 0.90)*	1.21 (0.91 – 1.61)
Male	0.94 (0.65 – 1.36)	1.67 (0.85 – 3.28)	1.29 (1.06 – 1.57)*
Nontraditional age	0.42 (0.23 – 0.75)**	0.45 (0.12 – 1.74)	0.67 (0.50 – 0.89)**
English not first language	1.01 (0.59 – 1.73)	1.22 (0.36 – 4.13)	1.20 (0.88 – 1.63)
HS grades†	0.93 (0.79 – 1.08)	0.88 (0.67 – 1.16)	0.98 (0.90 – 1.07)
First generation	1.35 (0.92 – 1.97)	0.41 (0.17 – 0.95)*	1.06 (0.86 – 1.31)
Hours worked per week†	0.97 (0.88 – 1.06)	0.96 (0.82 – 1.14)	0.87 (0.82 – 0.91)***
Neither credential nor transfer goal	6.52 (2.46 – 17.33)***	1.40 (0.15 – 12.74)	2.84 (1.28 – 6.28)*
Goal to transfer without credential	1.85 (1.14 – 2.99)**	2.67 (1.24 – 5.76)*	1.54 (1.17 – 2.02)**
When registered for classes†	1.12 (0.78 – 1.60)	0.64 (0.31 – 1.33)	1.10 (0.89 – 1.35)
Enrolled part time	1.22 (0.83 – 1.78)	1.39 (0.72 – 2.69)	1.25 (1.02 – 1.53)*
Enrolled in one or more develop. course	0.85 (0.56 – 1.27)	0.80 (0.40 – 1.60)	1.21 (0.97 – 1.51)
Received financial aid	0.95 (0.66 – 1.39)	1.92 (0.93 – 3.99)	1.15 (0.94 – 1.41)
Attended orientation on-campus or online	0.65 (0.44 – 0.96)*	0.24 (0.12 – 0.46)***	0.74 (0.59 – 0.91)**

Table 5, cont.

<i>Model 3: Addition of Engagement Factors</i>			
<i>Variable</i>	<i>1 vs. 3</i> <i>Will accomplish my goal; not return</i> <i>vs.</i> <i>Return within the next 12 months</i> (95% CI)	<i>2 vs. 3</i> <i>No current plans to return</i> <i>vs.</i> <i>Return within the next 12 months</i> (95% CI)	<i>4 vs. 3</i> <i>Uncertain</i> <i>vs.</i> <i>Return within the next 12 months</i> (95% CI)
Enrolled in orientation course	0.64 (0.25 – 1.65)	0.10 (0.01 – 0.90)*	0.48 (0.27 – 0.84)*
Academic and social support network	0.70 (0.57 – 0.85)***	0.62 (0.44 – 0.88)**	0.85 (0.76 – 0.95)**
Independent learning	1.14 (0.94 – 1.39)	0.63 (0.48 – 0.82)**	0.95 (0.87 – 1.05)
Clear academic plan and pathway	1.00 (0.80 – 1.26)	0.59 (0.39 – 0.89)*	1.01 (0.89 – 1.14)
Skills training	1.18 (0.95 – 1.47)	1.17 (0.77 – 1.78)	0.90 (0.80 – 1.00)
Dialogue and feedback	0.89 (0.72 – 1.09)	0.96 (0.67 – 1.39)	0.92 (0.82 – 1.03)
Ancillary instruction	1.26 (1.05 – 1.51)*	1.03 (0.69 – 1.53)	1.07 (0.96 – 1.20)
Collaboration	1.30 (1.09 – 1.54)**	1.22 (0.88 – 1.70)	1.06 (0.94 – 1.19)
Intensive advising	0.98 (0.78 – 1.23)	1.91 (1.22 – 2.97)**	0.97 (0.86 – 1.10)

*** $p < .001$; ** $p < .01$; * $p < .05$
 † Ordered categories

Student Bridge Variables

For bridge variables (academic goals, registration timing, part- or full-time enrollment, enrollment in at least one developmental course, whether the student received financial aid, and attended an orientation program or an extended orientation course), the most prominent finding is in terms of what goals new students have upon entering college. As seen in Model 3, the odds of new students to have responded they will accomplish their goal(s) in the current term and not return is 6.52 times higher ($p < .001$) if they intend to neither seek a credential nor transfer. This reveals that these students likely are at the college to achieve an immediate goal such as transferrable college credit or to gain specific knowledge or skills that may benefit them elsewhere (though the CI for this relatively rare response option is quite large given the infrequency of the response, from 2.46 to 17.33 times higher). For the comparisons in the second and third columns too, the odds of having no plans to return and/or being uncertain are significantly and notably higher

for students without a credential goal. Indeed, the addition of engagement variables appears to have a suppression effect (Astin & Antonio, 2012) on the relationship between goals and persistence intentions generally (four of the six odds ratios for these two dummy variables in Model 3 increase relative to Model 2). In other words, the relationship between non-persistence intentions (the three outcome variable comparisons) and the lack of credential goals is stronger than what originally appears without also considering engagement factors. Ultimately, these dynamics in the model serve to underscore the close relationship of persistence intentions and credential aspirations, as well as how that relationship may be moderated when students have other goals not always construed as success measures by colleges and assessment agencies.

In terms of interventions in this block of bridge variables, the relationship of orientation to persistence is noteworthy. As seen in Table 5, third column, if a student attended an online or on-campus orientation, their odds of reporting being uncertain about returning (compared to planning to return within 12 months) is 26% lower (odds ratio = 0.74, $p < .01$) all else being equal and 52% lower (odds ratio = 0.48, $p < .05$) if enrolled in an extended orientation course. This makes sense since orientation is designed to reduce uncertainty and help students accomplish their goals. The odds are even lower (76% lower, odds ratio = 0.24, $p < .001$; and 90% lower, odds ratio = 0.10, $p < .05$; respectively) that students participating in these programs would have no current plans to return. Therefore, conversely, they are more likely to plan to return. Whether these effects are outcomes of orientation programs or due to the disposition of students who take advantage of them is not discernable, but the strong relationship is evident.

Lastly, at the risk of reading too much into the lack of evidence (which is not necessarily evidence of lack of effect), there was no detectable effect for being enrolled in developmental coursework nor was there an effect for part-time enrollment, except for 25% higher odds of part-time students being uncertain about returning. Both factors typically figure prominently in student engagement research (Crisp & Nora, 2010; McClenney, 2007), and so the lack of association here is noteworthy. Either the data and/or model were generally not sensitive enough to these effects, or not enough time had passed for students to be susceptible to the detrimental impact such enrollment status can have on college student trajectories (Bailey et al., 2010).

Student Engagement Factors

In terms of engagement factors that are the focus of this study, and introduced in Model 3 (Table 5) after controlling for background and bridge variables, few were significantly related to plans to persist. The most prominent among those that were significant was that of academic and social support network (which entails such things as instructors explaining policies and resources, students learning the name of peers, and staff taking a personal

interest in a student, etc.). This engagement factor was significantly and negatively related to all three non-persistence intentions. Students with one standard deviation higher scores on the factor had 30% lower odds (odds ratio = 0.70, $p < .001$) to have stated they will accomplish their goal(s) in the current term and not return; 38% lower odds (odds ratio = 0.62, $p < .01$) to have stated they have no current plans to return; and 15% lower odds (odds ratio = 0.85, $p < .01$) to have reported being uncertain.

Another noteworthy finding (Table 5, second column), and in terms of this study's focus on advising activities, was that whereas a one standard deviation increase in essential advising activities comprising the clear academic plan and pathway factor corresponded to a 38% *decrease* in the odds (odds ratio = 0.62, $p < .01$) of a student having no current plans to return, a one standard deviation jump in intensive advising activities was related to a 91% *increase* in those odds (odds ratio = 1.91, $p < .01$). In other words, differences in types of advising were associated with odds of non-persistence in opposite ways. A clear academic plan and pathway—which constitutes accessibility of advisors, help with selecting a program and courses, creating a plan, and discussing outside commitments—is related to lower odds of non-persistence intentions whereas even more intensive advising activities—aid throughout the enrollment process, review of placement processes, consulting about importance of attainment and total time commitment needed, consulting about career/program fit, and likely career outcomes, among other things—is related to higher odds of non-persistence intentions. Because the study is cross-sectional, causal relationships here cannot be substantiated, but the higher odds of non-persistence intentions for those who receive intensive advising seems counterintuitive as one might suppose, and previous literature might indicate, that more intense advising would be associated with lesser odds of uncertainty or non-persistence intentions.

Only three other engagement factors were significant in our models beyond the support networks and advising functions discussed above. The factor of independent learning was associated with lower odds (0.63, $p < .01$) of students have no current plans to return, whereas the factors of ancillary instruction (odds ratio = 1.26, $p < .05$) and collaboration (odds ratio = 1.30, $p < .01$) were both associated with higher odds of a student accomplishing goal(s) in the current term and not returning.

Our models did not reveal evidence for significant relationships of two engagement factors with non-persistence intentions. Neither skills training nor dialogue and feedback were related to the three outcome response comparisons. Important relationships may be present, just not apparent given the model sensitivity and scope of the data set. These engagement factors may well be related to persistence in other ways (not just persistence intentions) and may also be related to other proximal and distal student success outcomes documented in the engagement literature.

DISCUSSION AND IMPLICATIONS

Results from this study show that advising activities and other engagement factors are related to new community college students' earliest persistence intentions but in limited and nuanced ways. We found three principal ways of understanding this nuance: (1) the relationship between engagement and persistence intentions heavily depends on individual goals, (2) different kinds of advising may have different effects for different students, and (3) the role of academic and social support networks matter in the near term and likely in the long term. We discuss these three findings in turn in relation to the research literature and their implications for practice.

Goals Mediate the Relationship of Engagement and Persistence

Foremost among our conclusions is that goal(s) and degree of certainty are critical for understanding the persistence intentions for new community college students, in agreement with previous research (Bers & Smith, 1991; Polinsky, 2003; Voorhees & Zhou, 2000). Of all the bridge variables and engagement variables, it was the academic goal variables that had the greatest and most consistently significant odds ratios for all three outcome comparisons. Looking across the three outcome comparisons, the odds ratios suggested varying levels of certainty in intentions related to those goals.

For instance, looking to the third column of Table 5, uncertainty about returning was the most clearly related to student background characteristics and individual bridge variables involved in the college intake process—nine of these 18 variables were significantly related—whereas only one of eight engagement factor scales was related. This aligns with the view that environmental factors outside the influence of the institution may be most influential in some students' commitment to college (Bean & Metzner, 1985; Braxton & Hirschy, 2005).

On the other extreme, students reporting they will accomplish their goal(s) and not return can be viewed as a comparatively certain intention, especially when considering the increased odds—over six times higher (95% CI of 2.46 to 17.33)—that this outcome is associated with a student having the goal neither of a credential nor transfer. This outcome is associated with just a few areas of engagement, but the odds actually increase with higher levels of ancillary instruction and collaboration, suggesting that new students with specific short-term intentions are utilitarian about their engagement and thus more readily seek out learning opportunities outside the classroom in pursuit of their goals. This agrees with research on interactionalist theories (Pascarella & Terenzini, 2005; Tinto, 1975) that posit the probable causal relationship for such students is one where goals and intentions lead to higher engagement rather than vice-versa.

In between uncertainty and certainty about not returning, the other response option was that of simply having no plans to return (second column). Arguably, students' lack of plans could be conflated with uncertainty, but on the other hand their lack of plans may also have a temporal component of waiting to decide if one semester is enough, compared to utilitarian enrollees who already know as much just a few weeks in to the academic term. This response option, while being the least commonly selected, was the one most clearly associated with engagement, in that four of eight engagement factors were found to be significantly related—including the only significant relationship for either of the engagement factors related to advising. At the same time, it was significantly related to only one of the two academic goal variables. Additionally, when compared to the other two response option comparisons, the odds that participants would have selected this middle ground response option were very low if they participated in some kind of orientation.

Collectively, these results suggest that engagement efforts by colleges, including advising, at least early on, play a relatively important role in persistence decisions for only a few students who are neither certain nor uncertain about their plans, and for whom academic goals are relatively loosely tied to their persistence intentions. Bailey and Alfonso (2005) recommended that in practice academic advising should be designed to increase goal commitment. Our findings corroborate that recommendation, but suggest that part of this process is gauging students' level of certainty about their goals, in order to distinguish among students who are mostly unsure if they can continue at all and those whose plans are simply unformulated. These findings and implications relate to our next conclusion.

Different Kinds of Advising May Matter at Different Times

Second among our conclusions is two-part: first, the factor analysis we conducted provided evidence in favor of the conceptual duality of prescriptive vs. developmental advising (Alexitch, 2013), and secondly, their related odds ratios vis-à-vis persistence intentions corroborates the observation that “developmental advising may not be suitable to, or even desired by, all students” (p. 178). Essential advising functions of the clear academic plan and pathway factor were related to lower odds of having no plans to return whereas more advanced or intensive advising activities, aligned with developmental advising activities, had a strong positive association with non-persistence intentions. Past research has conceptualized advising in terms of its frequency, intensity, and quality being related proportionally to persistence and persistence intentions (Bahr, 2008; Braxton et al., 1988; Metzner, 1989; Metzner & Bean, 1987; Shields, 1994; Swecker et al., 2013). But our findings cast that supposed unidirectional relationship into question, at least early on in some students' experience at community college.

Future research is needed to further probe the dualistic nature of advising in relation to student intentions and actual persistence. The findings do not reveal whether the contrasting effects are causal or correlational or a mix of both, though theory provides some possible leads. The association of non-persistence intentions with in-depth advising activities could be seen to corroborate the idea of students “cooling out” after becoming overwhelmed with intractable decisions, or even gaining insight into limitations of what the college can offer them and in turn formulating alternate plans (such as pursuing training, higher education, or extracurricular opportunities elsewhere). However, Bahr’s (2008) research directly refutes this hypothesis, and is a finding confirmed by Goldrick-Rab’s (2010) review of the evidence showing “there is little support for the idea that [community college] students level or reduce their expectations in response to feedback about their academic abilities or planned occupational requirements” (p. 439). The effect may be due to the kinds of students who are targeted for certain advising functions or even a function of doubtful and inquisitive students who seek out consultation beyond essential advising functions—though avoidance behavior of undecided students would suggest otherwise (Gordon, 2007).

Rather, our findings corroborate research that students may benefit from different kinds of advising at different times (Alexitch, 2013), thus connecting again to the observation that practitioners and faculty members may do well to pay attention to both goals and certainty. If students are doubtful about their intention to persist, it could be because they do not understand how to navigate the college environment or recognize resources that may help them to achieve their goals. Alternately, it could be that they understand these dynamics as well as anyone, but are simply facing obstacles or competing demands in their life that are difficult to manage. But the distinction takes time to tease out, and by necessity, it may take more intensive developmental advising to uncover or even formulate goal certainty in the first place, presenting a potential conundrum for practical implications. But if we accept the research that shows the critical importance of faculty members as developmental advisors (Astin, 1993; Frost, 1995; McArthur, 2005; Pascarella & Terenzini, 2005), then it follows that scarce advising resources might best be focused on information-centered activities for new students and that advisors’ expertise in developmental activities might best be used over time in partnership with faculty who are invested and prepared for this role.

Academic and Social Support Networks Matter in the Short Term and Long Term

Lastly, we consider the broader picture of advising as one of many forms of engagement. Of all engagement factors, the academic and social support network factor was most consistently related to lower odds for all three kinds of non-persistence intentions. The kinds of activities in this scale

asked the level of agreement that: “the instructors at this college want me to succeed,” “all instructors clearly explained academic and student support services available at this college,” “all instructors clearly explained course grading policies” and “course syllabi,” “I knew how to get in touch with my instructors outside of class,” “At least one instructor learned my name,” “At least one other student whom I didn’t previously know learned my name,” and “I learned the name of at least one other student in most of my classes.” These interactions involve students’ instructors and classmates alike, and so speak to the importance of academic and social integration as specified in classic interactionalist theories (Pascarella & Terenzini, 2005; Tinto, 1975).

This finding is important in light of nuances so far overlooked in the engagement literature. In CCSSE validation studies (McClenney et al., 2006), there is evidence for two different kinds of relationships at play. McClenney and colleagues’ data showed that whereas ultimate college *completion* is more closely related to active-collaborative learning and student-faculty interaction, the relationship was not as clear for measures of student effort and academic and social support networks. However, these latter forms of engagement did have a fairly clear relationship with *persistence* or *re-enrollment*. To be sure, persistence and completion are distinct outcomes and are not directly comparable. But the latter requires the former. Thus, as revealed in this study on early engagement, it would appear that academic and social support may be linked to increased likelihood of persistence intentions in the near term, and, if persistence intentions are born out, indirectly to completion in the long term, as revealed in engagement studies conducted over time.

This notion would therefore underscore Hu’s (2011) observation that it is important to think about types or forms of engagement as much as in terms of levels or extent of engagement. Furthermore, our findings speak to the potential importance of yet a third facet of engagement: the timing of interventions designed to foster it. Indeed, evidence from help-seeking research shows that students’ perceptions of the academic environment and the degree to which they feel either isolated or validated—especially for underserved minorities and men—are directly related to later help-seeking behaviors (Alexitch, 2002, 2013; Gloria, Hird, & Navarro, 2001; Nora & Cabrera, 1996).

Collectively, the findings that may link these different bodies of literature means in practice that the consequences of establishing students’ academic and social support networks should not be underestimated, and therefore such fundamental actions matter as instructors clarifying expectations, explaining support resources, and showing students that they want them to succeed. Additionally, something that all campus members can do—including students, staff, and faculty—is to make early connections by something as simple as learning people’s names. These actions therefore are not only indicative of, but actually help create, institutions that “make good on the promise that...larger numbers of [their] students are starting right” (CCCSE, 2007, p. 2).

REFERENCES

- Alexitch, L. R. (2002). The role of help-seeking attitudes and tendencies in students' preferences for academic advising. *Journal of College Student Development*, 43(1), 5–19.
- Alexitch, L. R. (2013). Help seeking and the role of academic advising in higher education. In S. A. Karabenick & R. S. Newman (Eds.), *Help seeking in academic settings: Goals, groups, and contexts* (pp. 175–202). New York, NY: Routledge.
- American Association of Community Colleges. (2015). *2015 fact sheet*. Retrieved from <http://www.aacc.nche.edu/AboutCC/Documents/FactSheet2015.pdf>
- Angell, L. R. (2009). Construct validity of the Community College Survey of Student Engagement (CCSSE). *Community College Journal of Research and Practice*, 33(7), 564–570.
- Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Development*, 25(4), 297–308.
- Astin, A. W. (1993). *What matters in college?: Four critical years revisited*. San Francisco, CA: Jossey-Bass.
- Astin, A. W., & Antonio, A. L. (2012). *Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education* (2nd ed.). Lanham, MD: Rowman & Littlefield.
- Astin, A. W., & Denson, N. (2009). Multi-campus studies of college impact: Which statistical method is appropriate? *Research in Higher Education*, 50(4), 354–367.
- Bahr, P. R. (2008). Cooling out in the community college: What is the effect of academic advising on students' chances of success? *Research in Higher Education*, 49(8), 704–732.
- Bailey, T. (2009). Challenge and opportunity: Rethinking the role and function of developmental education in community college. *New Directions for Community Colleges*, 145, 11–30.
- Bailey, T., & Alfonso, M. (2005). *Paths to persistence: An analysis of research on program effectiveness at community colleges*. Indianapolis, IN: Lumina Foundation for Education.
- Bailey, T., Jeong, D. W., & Cho, S.-W. (2010). Referral, enrollment, and completion in developmental education sequences in community colleges. *Economics of Education Review*, 29(2), 255–270.
- Bailey, T., Leinbach, T., & Jenkins, D. (2006). *Is student success labeled institutional failure? Student goals and graduation rates in the accountability debate at community colleges* (CCRC Working Paper No. 1). New York, NY: Community College Research Center, Teachers College, Columbia University.
- Barnett, E. A. (2011). Validation experiences and persistence among community college students. *The Review of Higher Education*, 34(2), 193–230.
- Beal, P. E., & Noel, L. (1980). *What works in student retention*. Iowa City, IA: American College Testing Program and National Center for Higher Education Management.
- Bean, J. P. (1982). Student attrition, intentions, and confidence: Interaction effects in a path model. *Research in Higher Education*, 17(4), 291–320.
- Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research*, 55(4), 485–540.

- Berger, J. B., & Milem, J. F. (1999). The role of student involvement and perceptions of integration in a causal model of student persistence. *Research in Higher Education, 40*(6), 641–664.
- Bers, T. H. (1988). Student major choices and community college persistence. *Research in Higher Education, 29*(2), 161–173.
- Bers, T. H., & Smith, K. E. (1991). Persistence of community college students: The influence of student intent and academic and social integration. *Research in Higher Education, 32*(5), 539–556.
- Bickel, R. (2007). *Multilevel analysis for applied research: It's just regression!*. New York, NY: Guilford Press.
- Braxton, J. M., Duster, M., & Pascarella, E. T. (1988). Causal modeling and path analysis: An introduction and an illustration in student attrition research. *Journal of College Student Development, 29*(3), 263–272.
- Braxton, J. M., & Hirschy, A. S. (2005). Theoretical developments in the study of college student departure. In A. Seidman (Ed.), *College student retention: Formula for student success* (pp. 61–88). Westport, CT: Praeger Publishers.
- Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, CA: Sage.
- Brooks-Leonard, C. (1991). Demographic and academic factors associated with first-to-second-term retention in a two-year college. *Community Junior College Research Quarterly of Research and Practice, 15*(1), 57–69.
- Cabrera, A. F., Castañeda, M. B., Nora, A., & Hengstler, D. (1992). The convergence between two theories of college persistence. *The Journal of Higher Education, 63*(2), 143–164.
- Cabrera, A. F., Nora, A., & Castañeda, M. B. (1993). College persistence: Structural equations modeling test of an integrated model of student retention. *The Journal of Higher Education, 64*(2), 123–139.
- Calcagno, J. C., Crosta, P., Bailey, T., & Jenkins, D. (2007). Stepping stones to a degree: The impact of enrollment pathways and milestones on community college student outcomes. *Research in Higher Education, 48*(7), 775–801.
- Center for Community College Student Engagement. (2004). *Engagement by design: 2003 findings*. Austin, TX: The University of Texas at Austin, Community College Leadership Program.
- Center for Community College Student Engagement. (2007). *Starting right: A first look at engaging entering students*. Austin, TX: The University of Texas at Austin, Community College Leadership Program.
- Center for Community College Student Engagement. (2010). *Benchmarking & benchmarks: Effective practice with entering students*. Austin, TX: The University of Texas at Austin, Community College Leadership Program.
- Center for Community College Student Engagement. (2012). *A matter of degrees: Promising practices for community college student success (a first look)*. Austin, TX: The University of Texas at Austin, Community College Leadership Program.
- Chang, J. C. (2005). Faculty student interaction at the community college: A focus on students of color. *Research in Higher Education, 46*(7), 769–802.
- Cheng, W., Ickes, W., & Verhofstadt, L. (2012). How is family support related to students' GPA scores? A longitudinal study. *Higher Education, 64*(3), 399–420.

- Clagett, C. A. (1989). Student goal analysis for accountability and marketing. *Community College Review*, 16(4), 38–41.
- Cohen, A. M., & Brawer, F. B. (2008). *The American community college* (5th ed.). San Francisco, CA: Jossey-Bass.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*. Mahwah, NJ: Lawrence Erlbaum.
- Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation*, 10(7), 1–9.
- Creamer, D. G. (1980). Educational advising for student retention: An institutional perspective. *Community College Review*, 7(4), 11–18.
- Creeden, J. E. (1990). Components of good advising: Differences in faculty and student perceptions. *NACADA Journal*, 10(2), 30–36.
- Crisp, G., & Nora, A. (2010). Hispanic student success: Factors influencing the persistence and transfer decisions of Latino community college students enrolled in developmental education. *Research in Higher Education*, 51(2), 175–194.
- Crookston, B. B. (1972). A developmental view of academic advising as teaching. *NACADA Journal*, 13(1), 12–17.
- D'Amico, M., Morgan, G., & Rutherford, G. (2011). The timing of pre-enrollment activities and predicting technical/community college student success. *The Journal of Applied Research in the Community College*, 19(1), 35–41.
- Davidson, W. B., Beck, H. P., & Milligan, M. (2009). The College Persistence Questionnaire: development and validation of an instrument that predicts student attrition. *Journal of College Student Development*, 50(4), 373–390.
- Derby, D. C., & Smith, T. (2004). An orientation course and community college retention. *Community College Journal of Research and Practice*, 28(9), 763–773.
- DesJardins, S. (2001). A comment on interpreting odds-ratios when logistic regression coefficients are negative. *AIR Professional File*, 81(Fall), 1–7.
- Dudley, D. M., Liu, L., Hao, L., & Stallard, C. (2015). Student engagement: A CCSSE follow-up study to improve student engagement in a community college. *Community College Journal of Research and Practice*, 39(12), 1153–1169.
- Elliott, K., & Healy, M. (2001). Key factors influencing student satisfaction related to recruitment and retention. *Journal of Marketing for Higher Education*, 10(4), 1–11.
- Feldman, M. J. (1993). Factors associated with one-year retention in a community college. *Research in Higher Education*, 34(4), 503–512.
- Fike, D. S., & Fike, R. (2008). Predictors of first-year student retention in the community college. *Community College Review*, 36(2), 68–88.
- Frost, S. H. (1995). Designing and implementing a faculty-based advising program. In G. Kramer (Ed.), *Reaffirming the role of faculty in academic advising* (pp. 27–32). Manhattan, KS: NACADA Monograph Series, Number 1.
- Gallagher, D. J., & Allen, N. (2000). First year initiatives and results of a year-long advising pilot study: A proposed advising model. *Journal of the First-Year Experience & Students in Transition*, 12(2), 107–128.
- Glass, J. C., & Garrett, M. S. (1995). Student participation in a college orientation course, retention, and grade point average. *Community College Journal of Research and Practice*, 19(2), 117–132.

- Gloria, A. M., Hird, J. S., & Navarro, R. L. (2001). Relationships of cultural congruity and perceptions of the university environment to help-seeking attitudes by sociorace and gender. *Journal of College Student Development, 42*(6), 545–62.
- Goldrick-Rab, S. (2010). Challenges and opportunities for improving community college student success. *Review of Educational Research, 80*(3), 437–469.
- Gonyea, R. M. (2005). Self-reported data in institutional research: Review and recommendations. *New Directions for Institutional Research, 2005*(127), 73–89.
- Gordon, V. N. (2007). *The undecided college student: An academic and career advising challenge*. Springfield, IL: Charles C. Thomas.
- Greene, T., Marti, C. N., & McClenney, K. M. (2008). The effort-outcome gap: Differences for African American and Hispanic community college students in student engagement and academic achievement. *The Journal of Higher Education, 79*(5), 513–539.
- Grimes, S. K., & Antworth, T. (1996). Community college withdrawal decisions: Student characteristics and subsequent reenrollment patterns. *Community College Journal of Research and Practice, 20*(4), 345–361.
- Grosset, J. M. (1991). Patterns of integration, commitment, and student characteristics and retention among younger and older students. *Research in Higher Education, 32*(2), 159–178.
- Habley, W. R. (1981). Academic advising: The critical link in student retention. *National Association of Student Personnel Administrators Journal, 18*, 45–50.
- Habley, W., Valiga, M., McClanahan, R., & Burkum, K. (2010). *What works in student retention? Fourth national survey: Community colleges report*. Iowa City, IA: ACT.
- Hagedorn, L. S., Maxwell, W. E., Cypers, S., Moon, H. S., & Lester, J. (2007). Course shopping in urban community colleges: An analysis of student drop and add activities. *The Journal of Higher Education, 78*(4), 464–485.
- Hale, J. M., & Bray, N. J. (2011). The impact of registration timing on student performance. *Community College Journal of Research and Practice, 35*(7), 556–573.
- Halpin, R. L. (1990). An application of the Tinto model to the analysis of freshman persistence in a community college. *Community College Review, 17*(4), 22–32.
- Hawley, T. H., & Harris, T. A. (2005). Student characteristics related to persistence for first-year community college students. *Journal of College Student Retention: Research, Theory & Practice, 7*(1), 117–142.
- Holgado-Tello, F. P., Chacón-Moscoso, S., Barbero-García, I., & Vila-Abad, E. (2010). Polychoric versus Pearson correlations in exploratory and confirmatory factor analysis of ordinal variables. *Quality & Quantity, 44*(1), 153–166.
- Hu, S. (2011). Reconsidering the relationship between student engagement and persistence in college. *Innovative Higher Education, 36*(2), 97–106.
- Jones-White, D. R., Radcliffe, P. M., Huesman Jr, R. L., & Kellogg, J. P. (2010). Redefining student success: Applying different multinomial regression techniques for the study of student graduation across institutions of higher education. *Research in Higher Education, 51*(2), 154–174.
- King, M. C. (1993). Academic advising, retention, and transfer. *New Directions for Community Colleges, 1993*(82), 21–31.

- Kinzie, J., Gonyea, R., Shoup, R., & Kuh, G. D. (2008). Promoting persistence and success of underrepresented students: Lessons for teaching and learning. *New Directions for Teaching and Learning*, 2008(115), 21–38.
- Kuh, G. D. (2001a). Assessing what really matters to student learning: Inside the National Survey of Student Engagement. *Change*, 33(3), 10–17.
- Kuh, G. D. (2001b). *The National Survey of Student Engagement: Conceptual framework and overview of psychometric properties*. Bloomington, IN: Indiana University Center for Postsecondary Research.
- Kuh, G. D., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *The Journal of Higher Education*, 79(5), 540–563.
- Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J. (2005). *Assessing Conditions to Enhance Educational Effectiveness: The Inventory for Student Engagement and Success*. Jossey-Bass.
- Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J. (2010). *Student success in college: Creating conditions that matter*. San Francisco, CA: John Wiley and Sons.
- Lance, C. E., Butts, M. M., & Michels, L. C. (2006). The sources of four commonly reported cutoff criteria what did they really say? *Organizational Research Methods*, 9(2), 202–220.
- Lester, J., Leonard, J. B., & Mathias, D. (2013). Transfer student engagement: Blurring of social and academic engagement. *Community College Review*, 41(3), 202–222.
- Long, S. (1997). *Regression models for categorical and limited dependent variables*. Thousand Oaks, CA: Sage.
- Luke, C., Redekop, F., & Burgin, C. (2015). Psychological factors in community college student retention. *Community College Journal of Research and Practice*, 39(3), 222–234.
- Marti, C. N. (2009). Dimensions of student engagement in American community colleges: Using the Community College Student Report in research and practice. *Community College Journal of Research and Practice*, 33(1), 1–24
- Martin, K., Galentino, R., & Townsend, L. (2014). Community college student success: The role of motivation and self-empowerment. *Community College Review*, 42(3), 321–241.
- McArthur, R. C. (2005). Faculty-based advising: An important factor in community college retention. *Community College Review*, 32(4), 1–18.
- McClenney, K. M. (2004). Redefining quality in community colleges: Focusing on good educational practice. *Change: The Magazine of Higher Learning*, 36(6), 16–21.
- McClenney, K. M. (2007). Research update: The Community College Survey of Student Engagement. *Community College Review*, 35(2), 137–146.
- McClenney, K. M., & Greene, T. (2005). A tale of two students: Building a culture of engagement in the community college. *About Campus*, 10(3), 2–7.
- McClenney, K. M., Marti, C. N., & Adkins, C. (2006). *Student engagement and student outcomes: Key findings from CCSSE validation research*. Austin, TX: Center for Community College Student Engagement. Retrieved from <http://www.ccsse.org/aboutsurvey/docs/CCSSE%20Validation%20Summary.pdf>

- McCormick, A. C., Kinzie, J., & Gonyea, R. M. (2013). Student engagement: Bridging research and practice to improve the quality of undergraduate education. In M. B. Paulsen (Ed.), *Higher education: Handbook of theory and research* (Vol. 28, pp. 47–92). Dordrecht, Netherlands: Springer.
- McCormick, A. C., & McClenney, K. M. (2012). Will these trees ever bear fruit?: A response to the special issue on student engagement. *The Review of Higher Education*, 35(2), 307–333.
- McKinney, L., & Novak, H. (2013). The relationship between FAFSA filing and persistence among first-year community college students. *Community College Review*, 41(1), 63–85.
- Metzner, B. S. (1989). Perceived quality of academic advising: The effect on freshman attrition. *American Educational Research Journal*, 26(3), 422–442.
- Metzner, B. S., & Bean, J. P. (1987). The estimation of a conceptual model of non-traditional undergraduate student attrition. *Research in Higher Education*, 27(1), 15–38.
- Moineddin, R., Matheson, F. I., & Glazier, R. H. (2007). A simulation study of sample size for multilevel logistic regression models. *BMC Medical Research Methodology*, 7(1), 34.
- Museum, S. D., & Quaye, S. J. (2009). Toward an intercultural perspective of racial and ethnic minority college student persistence. *The Review of Higher Education*, 33(1), 67–94.
- Nakajima, M. A., Dembo, M. H., & Mossler, R. (2012). Student persistence in community colleges. *Community College Journal of Research and Practice*, 36(8), 591–613.
- Nelson Laird, T. F., Chen, D., & Kuh, G. D. (2008). Classroom practices at institutions with higher-than-expected persistence rates: What student engagement data tell us. *New Directions for Teaching and Learning*, 2008(115), 85–99.
- Nelson Laird, T. F., & Kuh, G. D. (2005). Student experiences with information technology and their relationship to other aspects of student engagement. *Research in Higher Education*, 46(2), 211–233.
- Nora, A. (2003). Access to higher education for Hispanic students: Real or illusory? In J. Castellanos & L. Jones (Eds.), *The majority in the minority: Expanding the representation of Latina/o faculty, administrators, and students in higher education* (pp. 47–68). Sterling, VA: Stylus.
- Nora, A., & Cabrera, A. F. (1996). The role of perceptions of prejudice and discrimination on the adjustment of minority students to college. *The Journal of Higher Education*, 67(2), 119–148.
- Nora, A., Crisp, G., & Matthews, C. (2011). A reconceptualization of CCSSE's benchmarks of student engagement. *The Review of Higher Education*, 35(1), 105–130.
- O'Bannon, T. (1994). An academic advising model. *NACADA Journal*, 14(2), 10–16.
- O'Connor, B. P. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instruments, & Computers*, 32(3), 396–402.
- Olsson, U. (1979). Maximum likelihood estimation of the polychoric correlation coefficient. *Psychometrika*, 44(4), 443–460.

- Pascarella, E. T., Smart, J. C., & Ethington, C. A. (1986). Long-term persistence of two-year college students. *Research in Higher Education*, 24(1), 47–71.
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research*. San Francisco, CA: Jossey-Bass.
- Pike, G. R. (2013). NSSE benchmarks and institutional outcomes: A note on the importance of considering the intended uses of a measure in validity studies. *Research in Higher Education*, 54(2), 149–170.
- Polinsky, T. L. (2003). Understanding student retention through a look at student goals, intentions, and behavior. *Journal of College Student Retention: Research, Theory and Practice*, 4(4), 361–376.
- Porter, S. R. (2003). Understanding retention outcomes: Using multiple data sources to distinguish between dropouts, stopouts, and transfer-outs. *Journal of College Student Retention: Research, Theory and Practice*, 5(1), 53–70.
- Porter, S. R., Rumann, C., & Pontius, J. (2011). The validity of student engagement survey questions: Can we accurately measure academic challenge? *New Directions for Institutional Research*, 2011(150), 87–98.
- Provasnik, S., & Planty, M. (2008). *Community colleges: Special supplement to the condition of education 2008* (NCES 2008-033). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage.
- Rendón, L. J., Jalomo, R. E., & Nora, A. (2000). Theoretical considerations in the study of minority student retention in higher education. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 127–156). Nashville, TN: Vanderbilt University Press.
- Roman, M. A., Taylor, R. T., & Hahs-Vaughn, D. (2010). The retention index of the Community College Survey of Student Engagement (CCSSE): How meaningful is it? *Community College Journal of Research and Practice*, 34(5), 386–401.
- Sáenz, V. B., Hatch, D. K., Bukoski, B. E., Kim, S., Lee, K., & Valdez, P. (2011). Community college student engagement patterns: A typology revealed through exploratory cluster analysis. *Community College Review*, 39(3), 235–267.
- Schuetz, P. (2008). A theory-driven model of community college student engagement. *Community College Journal of Research and Practice*, 32(4-6), 305–324.
- Scott-Clayton, J. (2011). *The shapeless river: Does a lack of structure inhibit students' progress at community colleges?* New York, NY: Community College Research Center, Teachers College, Columbia University.
- Seidman, A. (1991). The evaluation of a pre/post admissions/counseling process at a suburban community college: Impact on student satisfaction with the faculty and the institution, retention, and academic performance. *College and University*, 66, 223–232.
- Shields, N. (1994). Retention, academic success, and progress among adult, returning students: A comparison of the effects of institutional and external factors. *NACADA Journal*, 14(1), 13–24.
- Sijtsma, K. (2009). On the use, the misuse, and the very limited usefulness of Cronbach's alpha. *Psychometrika*, 74(1), 107–120.

- Smith, A. B., Street, M. A., & Olivarez, A. (2002). Early, regular, and late registration and community college student success: A case study. *Community College Journal of Research and Practice*, 26(3), 261–273.
- Spady, W. G. (1970). Dropouts from higher education: An interdisciplinary review and synthesis. *Interchange*, 1(1), 64–85.
- Strayhorn, T. L. (2012). Satisfaction and retention among African American men at two-year community colleges. *Community College Journal of Research and Practice*, 36(5), 358–375.
- Stuart, G. R., Rios-Aguilar, C., Deil-Amen, R. (2014). “How much economic value does my credential have?”: Reformulating Tinto’s model to study students’ persistence in community college. *Community College Review*, 42(4), 327–341.
- Swecker, H. K., Fifolt, M., & Searby, L. (2013). Academic advising and first-generation college students: A quantitative study on student retention. *NACADA Journal*, 33(1), 46–53.
- Tabachnick, B. G., & Fidell, L. S. (2012). *Using multivariate statistics* (6th ed.). Upper Saddle River, NJ: Pearson.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45(1), 89–125.
- Tinto, V. (1988). Stages of student departure: Reflections on the longitudinal character of student leaving. *The Journal of Higher Education*, 59(4), 438–455.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago, IL: University Of Chicago Press.
- Voorhees, R. A. (1987). Toward building models of community college persistence: A logit analysis. *Research in Higher Education*, 26(2), 115–129.
- Voorhees, R. A., & Zhou, D. (2000). Intentions and goals at the community college: associating student perceptions and demographics. *Community College Journal of Research and Practice*, 24(3), 219–233.
- Webb, E. M. (1987). Retention and excellence through student involvement: A leadership role for student affairs. *NACADA Journal*, 24(4), 6–11.
- Webb, M. W. (1988). Freshman year retention at three campuses of a large urban community college district: 1983–1986. *Community Junior College Research Quarterly of Research and Practice*, 12(3), 213–242.
- Webb, M. W. (1989). A theoretical model of community college student degree persistence. *Community College Review*, 16(4), 42–49.
- Wolf-Wendel, L., Ward, K., & Kinzie, J. (2009). A tangled web of terms: The overlap and unique contribution of involvement, engagement, and integration to understanding college student success. *Journal of College Student Development*, 50(4), 407–428.
- Wood, J. L. (2012). Examining academic variables affecting the persistence and attainment of Black male collegians: A focus on academic performance and integration in the two-year college. *Race Ethnicity and Education*, 17(5), 601–622.
- Wood, J. L., & Moore, C. S. (2015). Engaging community college transfer students. In S. R. Harper & S. J. Quayle (Eds.), *Student engagement in higher education* (2nd ed., pp. 271–306). New York, NY: Routledge.
- Wood, J. L., & Turner, C. S. (2010). Black males and the community college: Student perspectives on faculty and academic success. *Community College Journal of Research and Practice*, 35(1-2), 135–151.

- Woosley, S. A. (2003). How important are the first few weeks of college? The long term effects of initial college experiences. *College Student Journal*, 37(2), 201-207.
- Woosley, S. A., & Miller, A. L. (2009). Integration and institutional commitment as predictors of college student transition: Are third week indicators significant? *College Student Journal*, 43(4), 1260-1271.
- Wright, D. B. (1997). Extra-binomial variation in multilevel logistic models with sparse structures. *British Journal of Mathematical and Statistical Psychology*, 50(1), 21-29.
- Young, R. B., Backer, R., & Rogers, G. (1989). The impact of early advising and scheduling on freshman success. *Journal of College Student Development*, 30, 309-312.