High School Predictors of College Persistence: The Significance of Engagement and Teacher Interaction

Daniel T. Sciarra, Holly J. Seirup, Elizabeth Sposato

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This study investigated factors from high school that might predict college persistence. The sample consisted of 7,271 participants in three waves of data collection (2002, 2004 and 2006) who participated in the Educational Longitudinal Study (ELS; U.S. Department of Education, 2008). A multinomial logistic regression mode was employed to distinguish those who persisted from those who did not. Results indicated that number of hours engaged in extracurricular activities and interaction with the math teacher outside of class distinguished those who persisted in a four-year college from those that did not. Implications for school, community, mental health and college student development counselors are discussed.

Keywords: **persistence, high school, college, teacher, extracurricular activities**

Over the past few decades there has been a dramatic paradigm shift in both focus and attitude among postsecondary institutions regarding the importance of student persistence, retention and academic success (Hu, 2011; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007), in contrast to the past where an institution's prestige was tied to its ability to exclude students (Coley & Coley, 2010). U.S. News and World Report solidified this sea change, as its report of college rankings now includes retention and graduation rates as a measure of institutional quality (Morse, 2015). In addition, colleges and universities are under increased pressure from public policymakers to improve retention and graduation rates (Hossler, Ziskin, & Gross, 2009). The matter of college graduation rates and persistence has in fact taken on national prominence. In a speech at the University of Texas at Austin, President Obama (2010) commented that

> over a third of America's college students and over half of our minority students don't earn a degree even after six years. So we don't just need to open the doors of college to more Americans; we need to make sure they stick with it through graduation. (Obama, 2010, para. 34)

The importance of completing a college degree has been magnified because of the high correlation with economic self-sufficiency and responsible citizenship (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008). In this regard, the college degree has come to replace the high school diploma.

Students, parents, high school counselors and college counselors expend much time and energy on the college admissions process with high expectations that the student will be successful and persist (Seirup & Rose, 2011). Yet, the statistics regarding college persistence are surprisingly low, while the cost of attrition to the student, the college and the community is quite high. Forty-one percent of students who begin their college careers at a four-year college will not graduate within six years (U.S. Department of Education, 2013), while 35% will drop out completely (Tinto, 2004). The costs associated with students dropping out of college are sobering and impact multiple stakeholders who would potentially benefit from individuals who persisted and graduated from college. The American Institutes for Research (2010) found that the cost of students dropping out of their first year of college

Daniel T. Sciarra, NCC, is a Professor at Hofstra University. Holly J. Seirup is an Associate Professor at Hofstra University. Elizabeth Sposato is Assistant Director of Career Services at New York Institute of Technology. Correspondence can be addressed to Daniel Sciarra, 160 Hagedorn Hall, Hofstra University, Hempstead, NY 11549, daniel.t.sciarra@hofstra.edu.

is more than nine billion dollars in state and federal funds. For individual students, the average debt is currently $29,000. More problematic is that those who drop out do not have the requisite economic and employment opportunities needed to repay those loans and therefore are four times more likely to default (Casselman, 2012). There also are the additional costs associated to the colleges and universities that need to provide redundant and remedial courses. Amos (2006) found that it costs $1.4 billion to provide remedial education to students who have recently completed high school. Finally, there are the costs to individuals who leave college without achieving their goals and are thus robbed of important opportunities to learn and benefit from that education after college (Hossler et al., 2009).

Prior Research on College Persistence

Based on the seminal work of authors such as Tinto (1975, 1987, 1993), Astin (1984, 1993), Kuh (2007), and Hu (2011), colleges and universities have begun to study factors that impact college persistence and, consequently, to develop and initiate programs to support student success, transition and persistence/retention. Tinto (1975) is perhaps the most recognized for work regarding college persistence. His original model focused on the impact of students' academic and social integration on the decision to persist but was later revised to focus more on the issues of separation from the home environment and culture, transition from high school to college, and incorporation into the campus community (Tinto, 1987). Tinto (1993) introduced a model of student departure where he addressed the fact that different groups of students (e.g., first generation, at-risk, adults) and different institutions (e.g., public, private, residential) required different retention programs and support services to support student persistence. For example, pre-entry attributes such as family background, skills and abilities, and prior schooling are included in this latest model, yet the main focus of the model is student integration and engagement at the postsecondary institution. Tinto (1993) found that students enter college with certain traits, experiences and intentions that are subsequently and continually modified and reformulated as a result of interactions between the individual and members of the institution's academic and social systems.

Astin (1993) found that student persistence was positively linked to involvement in academic and social activities along with interaction with faculty and peers. Kuh et al. (2007) found that most persistence and retention models included the following variables: (a) student background characteristics including pre-college academic and other experiences; (b) structural characteristics of institutions such as mission, size and selectivity; (c) interactions with faculty, staff members, and peers; (d) student perceptions of the learning environment; and (e) the quality of effort students devote to educational activities. Pascarella and Terenzini (2005) found the main variables that impact college persistence were: (a) academic performance as measured by grades, particularly those in the first semester/year; (b) academic support programs (e.g., developmental studies, remedial programs, supplemental instruction, instruction in non-academic support skills such as study skills and time management, first-year seminars, academic advising, counseling, and undergraduate research programs); (c) financial aid (the impact and importance of grants, scholarships, and loans and how these things often impact a student's decision and need to work by reducing the economic obstacles one may face when deciding to persist); (d) interaction with faculty (the perception that faculty are available outside of the classroom positively impacts student persistence); (e) interaction with peers; (f) residence (overall, living on campus positively impacts persistence); (g) learning communities that promote both academic and social interaction; (h) academic major; and (i) social interaction in the form of extracurricular and social involvement. Pascarella and Terenzini (2005) further noted that the degree of integration into campus social systems had positive net effects on persistence and ultimately degree attainment, while involvement in extracurricular activities and the extent and quality of students' peer interactions were particularly influential.

Current literature on college persistence continues to be based upon the work and models of Tinto, Astin and Kuh but has also focused on the impact of race and ethnicity (Arbona & Nora, 2007; Lundberg & Schreiner, 2004), finding that key variables on persistence are consistent with prior research. Lundberg and Schreiner (2004) found that "satisfying relationships with faculty members and frequent interaction with faculty members, especially those that encouraged students to work harder were strong predictors of learning across every racial group" (p. 559). Arbona and Nora (2007) supported prior findings that academic integration and engagement are significant predictors of persistence for Hispanic students as well.

Currently, a public outcry exists for colleges and universities to be more accountable in supporting students' persistence to graduation (Nelson, 2012; U.S. Department of Education, 2006). The response to this outcry and the research on college persistence and academic success has been the implementation of initiatives to support students' transitions from high school to college. These initiatives appear to focus on pre-admission/pre-college attributes such as family background, socioeconomic status and academic performance measured by high school GPA, SAT and ACT scores. Examples of such initiatives include enhanced orientation programs, freshman seminars, living-learning communities and housing options. The resulting outcome data from the successful implementation of these types of support initiatives have yielded increases in retention rates (Barefoot, 2004). Higher education institutions have therefore come to realize the important role the first year, and even the first few weeks, of college may play in a student's decision to persist.

The above review indicates a clear identification of factors on the college level that impact persistence. Little is known, however, about whether these factors on the high school level can impact college persistence. If such factors could be identified, then counselors who work with pre-college adolescents could increase a student's chances of persisting in college by developing and strengthening these factors.

While in the academic realm it seems clear that the intensity of the high school curriculum and GPA are predictive of academic success in college (Adelman, 2006; Kuh, et.al., 2008; Sciarra, 2010; Sciarra & Whitson, 2007; Trusty & Niles, 2003), less is known about the predictive effect upon persistence of other high school experiences and skills such as engagement in extracurricular activities, interaction with faculty, amount of time spent studying and doing homework, time doing paid and volunteer work, and the amount of social and academic support. Research (e.g., Kuh, 2007) has shown these factors in college to have a relationship to persistence; yet little if any research has shown whether such factors in high school are predictive of college persistence. This study seeks to answer the following question: Do the same factors at the college level that have a relationship to persistence also have a predictive value for persistence when measured at the high school level?

Method

The study used data from the three waves of ELS (U.S. Department of Education, 2008). ELS included a base year of 10th graders in 2002 followed by two subsequent waves that took place in 2004 and 2006. The base year of ELS comprised a nationally representative probability sample of 15,362 10th graders. A second wave of data in 2004 came from the same base-year participants in their senior year, and a third wave in 2006 came 2 years after scheduled graduation (Sciarra & Ambrosino, 2011). The base year of ELS employed a two-stage sample selection process. Schools were chosen with probability proportional to school size, and size was a composite measure based on school enrollment by race and ethnicity. There were 1,221 eligible public, Catholic and other private schools. Of these,

752 agreed to participate and were asked to provide sophomore enrollment lists. To deal with non-response bias, ELS conducted analyses in conjunction with weighting adjustment to reduce but not completely eliminate all bias. In the second step of sample selection, 26 students were selected from these lists using a stratified systematic sampling of students selected on a flow basis (Ingels et al., 2007). To provide non-academic data, participants completed paper-and-pencil, self-administered questionnaires usually done in the school setting. The ELS Web site provides actual copies of the questionnaires.

Participants

Participants included students who participated in all three waves (2002, 2004 and 2006) of ELS (U.S. Department of Education, 2008) and who enrolled in either a two-year or four-year institution upon graduation from high school. The enrollment condition was necessary since the study is an investigation into those who persisted in college versus those who did not. This resulted in a final N of 7,271. Participants also included sophomore math and English teachers. The student participants were 54% female and 46% male. Their ethnic identification was 1% Native American, 5% Asian, 15% African American, 13% Latino, 62% White, and 4% Multiracial. Since not all of the originally selected schools participated in the study's three waves, the data were weighted to adjust for this and for probabilities that were unequal in the selection of schools and students (Ingels, Pratt, Rogers, Siegel, & Stutts, 2005). There are two main steps in the weighting process. First is the calculation of unadjusted weights as the inverse of the probabilities of selection; second, these weights are adjusted to compensate for non-response (Curtin, Ingels, Wu, & Heuer, 2002) and result in a relative weight derived by dividing the panel weight of the data base by the average weight of the sample.

Variables

The study employed a total of nine predictor variables, seven categorical and two interval.

Categorical variables. Four of the categorical variables were yes/no questions, two of which were teacher-reported. Both the student's math and English teachers were asked: "Does this student talk with you outside of class about school work, plans for after high school or personal matters?" ELS limits its survey to only the math and English teachers. Another yes/no question included asking the students if they had gone to the school counselor for college entrance information, and the fourth asked the students whether they had performed any unpaid, volunteer, community service work during the past two years. The remaining three variables were the result of categorizing the number of hours spent weekly working at a job, doing homework and performing extracurricular activities. As regards to hours worked at a job, the original 10-category variable was collapsed into four categories: "none," "low" (1 to 10 hours per week), "moderate" (11 to 20 hours per week), and "high" (21 or more hours per week). Hours spent weekly doing homework in or out of school were categorized as "very low" (none to less than 1 hour), "low" (1 to 6 hours), "moderate" (7 to 15 hours), and "high" (16 or more hours). Time spent weekly in extracurricular activities was categorized as "none," "low" (less than 1 hour to 4 hours), "moderate" (5 to 14 hours), and "high" (15 or more hours). The two teacher-reported variables were from sophomore year, while the rest were asked of students in their senior year.

Interval variables. Created from individual items in the database, the study employed two composite, interval variables: academic and social support. These variables were selected based upon the research of Pascarella and Terenzini (2005), Kuh (2007), and Hu (2011) who identified these constructs as being integral to a student's success in higher education. The academic support variable was composed of three Likert-scaled items: (1) "Among your close friends, how important is it to them that they study?"; (2) "Among your close friends, how important is it that they finish

high school?"; and (3) "Among your close friends, how important is it that they continue their education past high school?" Cronbach's alpha for the academic support scale was .72. The social support variable was also composed of three Likert-scaled items: (1) "Among your close friends, how important is it that they get together with friends?"; (2) "Among your close friends, how important is it that they go to parties?"; and (3) "How important is it to you to have strong friendships in your life?" Cronbach's alpha for the social support scale was .49. All questions were asked of students in their sophomore year of high school and had three choices for answers: (1) not important, (2) somewhat important and (3) very important. Higher scores represented greater socialization.

Criterion variable. The criterion variable measured student status 2 years after scheduled graduation and had three categories: (1) leaver (enrolled after high school but not enrolled in January of 2006), (2) still enrolled in a two-year institution, and (3) still enrolled in a four-year institution. This same criterion variable with four categories was used in a previous study (Sciarra & Ambrosino, 2011).

Data Analysis

Since the criterion variable has three categories (leaver, still enrolled in a two-year institution, still enrolled in a four-year institution), the appropriate method for analysis is a multinomial logistic regression (MLR; Norusis, 2004). The MLR models the relationship between a categorical criterion variable and predictor variables (Menard, 2010; Norusis, 2004; Pampel, 2000). In MLR, the effect size results from the odds ratios for each predictor. Odds ratios are ratios of the probability of being in a particular group compared to being in the baseline or reference group (Sciarra & Ambrosino, 2011). In the present analysis, the reference group was the first category (leaver), to which the other groups were compared along the predictor variables. Unlike linear regression, MLR employs categorical variables and cannot rely on traditional transformation methods to deal with missing data. The SPSS default position was employed, which excludes all cases with missing values on any of the independent variables. The analysis, more theory-testing than exploratory, utilized the forced entry method where all predictors are entered at the same time into the regression equation. In large data sets, there is a danger of overdispersion. To check for this, a dispersion parameter was calculated by dividing the Pearson chi square goodness of fit by the degrees of freedom, which equaled 1.23. While any parameter greater than 1 indicates the presence of overdispersion, only a parameter approaching or greater than 2 suggests a problem (Field, 2009).

Results

The original MLR model had nine predictor variables (academic support, social support, talks with math teacher outside of class, talks with English teacher outside of class, has gone to counselor for college entrance information, performed volunteer/community service work, number of hours spent weekly on working, homework and extracurricular activities). From the sample of 7,271 who participated in all three waves (2002, 2004 and 2006) of ELS (U.S. Department of Education, 2008) and who enrolled in either a two-year or four-year institution upon graduation from high school, academic support [χ^2 (2, 3148) =.90, ϱ=.64], social support [χ^2 (2, 3148) =.59, ϱ=.74], talks with English teacher outside of class [χ^2 (2, 3148) =1.14, ϱ=.57] , has gone to counselor for college entrance information [χ^2 (2, 3148) =1.44, ϱ=.49], performed community/volunteer service [χ^2 (2, 3148) =.63, ϱ=.73], and number of hours worked [χ^2 (6, 3148) =4.64, ϱ=.59] were not significant and therefore were excluded from subsequent analyses.

The revised model included the three remaining variables whose correlations were .066 (hours

spent on homework and talks with math teacher outside of class), .00 (number of hours spent on extracurricular activities and talks with math teacher outside of class, and .01 (number of hours spent on homework and number of hours spent on extracurricular activities). Low correlations along with low standard errors (ranging from .06 to .18) among the independents suggest the absence of multicollinearity. Tests for multicollinearity revealed tolerances values and various inflations factors to hover around 1.0, and the highest condition index was 7.9. All observations reveal low risk of multicollinearity (Cohen, Cohen, West, & Aiken, 2013).

For the MLR examining the effects of the three predictor variables, the likelihood ratio test for the overall model revealed that the model was significantly better than the intercept-only model [χ^2 (14, 7271) = 594.63, p < .000]. In other words, the null hypothesis (that the regression coefficients of the independent variables are zero) was rejected. Both the Hosmer-Lemeshow test (Hosmer & Lemeshow, 2000) for model deviance [χ^2 (48)=59.87, p < .117] and the goodness of fit test [χ^2 (48)=58.53, p < .142] failed to reject the null hypothesis, implying that the model's estimates fit the data at an acceptable level. Furthermore, the likelihood ratio test for individual effects showed that all of the predictor variables were significantly related to the categories of the criterion variable: talks with math teacher, χ^2 (2) = 14.94, p < .001; hours of homework, χ^2 (6) = 13.50, p < .05; and hours of extracurricular activities, χ^2 (6) = 533.65, p < .000. Regarding effect size, the Nagelkerke R^2 (Norusis, 2004) in the overall model was .086, considered a medium effect size (Sink & Stroh, 2006). Therefore, the independent variables included in the model explained 8.6% of the variability in college persistence.

Table 1

MLR Parameter Estimates and the Effects of the Predictor Variables Upon Postsecondary Education Status.

	Still Enrolled in Two-Year Institution		**Still Enrolled in Four-Year Institution**	
VARIABLE	β	Odds	β	Odds
Talks with Math Teacher Outside of Class				
No	.04	1.04	.21***	1.24
Yes				
Hours Spent Weekly on Homework				
Very Low	.13	.88	.08	1.08
Low	.20	1.23	.24	1.27
Moderate	.16	1.17	.18	1.20
High				
Hours Spent Weekly on Extracurricular Activity				
None	-.25*	.78	-1.6***	.20
Low	-.12	.86	-.58***	.56
Moderate	-.01	.99	-.15	.86
High				

Note. Leaver is the reference category for the dependent variable. The comparison categories for the predictor variables were talking to the math teacher outside of class, high (16 or more) number of hours per week on homework, and high (15 or more) number of hours spent in extracurricular activities. AM software (American Institutes for Research, 2003) was used to calculate adjusted standard errors for sampling design effects. Nagelkerke R^2 = .09. * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

Table 1 gives the parameter estimates from the MLR that analyzed the effects of the predictor variables on postsecondary education status and presents two nonredundant logits since our criterion variable (postsecondary status) has three possible values: leaver, still enrolled in a two-year institution, and still enrolled in a four-year institution. When comparing those still enrolled in a two-year institution to those no longer enrolled, the only parameter estimate that was significantly different from zero was time spent in extracurricular activities. Those students with no extracurricular activities (β=-.25) compared to those with a high number extracurricular activities (15 or more hours per week) were less likely to still be enrolled in a two-year institution. When examining the second logit (those still enrolled in a four-year institution compared to those no longer enrolled in any postsecondary institution), two predictors were significant: talks to the math teacher outside of class and time spent in extracurricular activities. Those students who spoke with their math teacher outside of class increased their chances of still being enrolled in a four-year institution rather than being in the leaver group by a factor of 1.24. The parameters for homework were not significant. In regards to the number of weekly hours in extracurricular activities, the parameters for none and low (1–4) hours were significant. Those students who spent either no or a low number of hours in extracurricular activities compared to those with a high number of hours (15 or more) were less likely to still be enrolled in a four-year institution. The difference between a moderate number (5–14) and a high number (15+) of hours spent in extracurricular activities was not significant.

Discussion

Based on previous research about factors in college related to persistence, this study hypothesized nine criterion variables on the high school level to predict college persistence. The hypothetical question guiding this study was: Would the same variables on the college level known to influence persistence predict persistence when measured at the high school level? Three of these nine variables were significant in the overall model: talks with math teacher outside of class, number of hours spent weekly on homework, and number of hours spent weekly on extracurricular activities. Six of the nine variables were not significant: academic support, social support, talks with English teacher outside of class, has gone to counselor for college entrance information, performed community/volunteer service, and number of hours worked. As a result, our original model was replaced with a more parsimonious model of three predictor variables. Furthermore, number of hours spent weekly on homework, while significant in the overall model, was not a strong enough predictor to distinguish those who persisted in two-year colleges from those who left or to distinguish those who persisted in four-year colleges from those who left. In the end, the two predictors strong enough to differentiate among the three groups were: talks with math teacher outside of class and number of hours spent in extracurricular activities.

Some of the predictor variables, like academic support and social support, were composite variables of just three Likert-scaled student-reported items. Thus, the reliability of these is questionable and may explain their lack of predictive value. Previous research (Kuh et al., 2008; Pascarella & Terenzini, 2005) has shown that college students with both academic and social support have a greater chance of persisting. Related to academic support, however, is seeking out and talking with professors outside of class. College students who interact with professors outside of class have a greater chance of persisting. The results of the present study indicate that high school students who spoke with their math teacher (not the English teacher) outside of class had a greater chance of persisting in a four-year college, but not necessarily in a two-year college. This result is not surprising as it was hypothesized that high school students who speak with their teachers outside of class would have a greater likelihood of doing so on the college level and, in turn, a greater likelihood of persisting in college. What may be surprising is that the predictive value lies

particularly with the math teacher. The predictive value of the math curriculum upon completion of the baccalaureate degree has been well established (Adelman, 1999, 2006; Trusty & Niles, 2003). Thus, based on previous research, one might argue that students taking math more seriously in high school will have a greater chance of persisting in a four-year college, and one indication of such seriousness is speaking with the teacher outside of class. This is not to say that speaking with other teachers is unimportant, but it may be that such communication has less of an effect upon college persistence and completion of a four-year degree. Many students find math difficult, especially the more advanced courses. Some students may have the self-confidence to approach math teachers, and these attributes contribute to their persistence in college. The average student, however, may not feel so comfortable. If students are able to overcome the intimidation of difficult and challenging subject matter by approaching their teacher either to seek help for material that is confusing and not understood or desiring further work, they will find fewer obstacles in approaching other teachers or professors. Without wishing to sound overly simplistic, it may be stated: If you can speak with a teacher whose subject matter you find difficult and challenging, you might be able to speak with anyone. It fosters a help-seeking quality that may very well contribute to persistence in college. A history of speaking with the high school math teacher outside of class may make it less intimidating to speak with university professors once the students arrive at a four-year institution.

The relationship between homework, extracurricular activities and college persistence merits some discussion. As mentioned previously, hours spent doing homework in high school were significant in the overall model of college persistence, but not strong enough to significantly differentiate those who persisted from those who did not. On the other hand, the number of hours spent in extracurricular activities was significant on both the four-year and two-year college levels. The relative lack of significance for homework is a surprising result, as studies show that college grades are related to hours spent doing homework and significantly impact persistence (Pascarella & Terenzini, 2005). Why then is homework not a significant predictor on the high school level? Kuh et al. (2007) found that 47% of high school students study 3 hours a week or less and receive predominantly A and B grades, and academic engagement declines in a linear fashion over the 4 years. This, taken into conjunction with extracurricular activities may explain why the latter is more important than the former. Research (Astin, 1993; Kuh et al., 2008; Pascarella & Terenzini, 2005) has shown that integration (i.e., a feeling of connectedness and belonging) is one of the strongest predictors of persistence on the college level. Participation in extracurricular activities is one of the many ways, if not the most effective way, students become integrated into the school environment. The present study shows that those involved in zero or low (1–4 hours weekly) number of hours of extracurricular activities were less likely to persist in a four-year institution. It can be suggested, then, that those who participated in a moderate (5–14 hours) and high (15+) number of hours in high school activities would more likely participate in clubs and activities on the college level, which may, in turn, foster their sense of belonging and integration in the college environment. This was somewhat less true for those who persisted in a two-year institution, where only those who had zero extracurricular activities were less likely to persist. It may be that since many two-year institutions are commuter schools, integration via participation in extracurricular activities may have a less important role in persistence. Among those who attend four-year colleges, the pathway to persistence initially may be through feeling part of something (e.g., a club, an activity, a sport), which fosters a sense of integration and consequential feelings of contentment. Rare are the students who like doing homework. More common, however, might be students who will do homework because they like the school environment, want to stay and do not want to be dismissed for academic reasons. In other words, the pathway to persistence may be through extracurricular activities.

Implications for Counseling Practice

Implications for School Counselors

School counselors are intricately involved in postsecondary planning and, in many schools, diligently work toward getting their students into the college of their choice (American School Counselor Association [ASCA], 2005b). One of the nine predictive variables in our initial model that was related to the school counselor, "gone to counselor for college entrance information," was not significant. Getting information from a counselor regarding college entrance requirements is transactional, and although it may assist a student with getting into college, it would not necessarily impact their persistence. Furthermore, this variable focuses on one aspect of the school counselor's complex role and not on the broader roles school counselors perform that can impact college persistence. The National Standards of ASCA (1997; Campbell & Dahir, 1997), the ASCA National Model (2003, 2005a), and the Transforming School Counseling Initiative (Education Trust, 1997) have contributed to determining the role of the school counselor as more proactive in maximizing the academic development of students. The results of our study imply that school counselors can influence factors related to persistence, namely extracurricular activities and talking with teachers outside of class. The ASCA National Model (ASCA, 2005a) focuses on the school counselor's role and responsibility to promote the development of students in the academic, career, and personal and social domains. Specifically, the school counselor could support and encourage students to engage in extracurricular activities and to interact/talk with teachers outside of class, which would be proactive measures under the ASCA model and also increase the chances of college persistence. Those who develop a sense of belonging (Adler, 1964) through extracurricular activities in high school will be more equipped to replicate this effort on the college level. School counselors have always tried to promote school bonding by connecting students to clubs and organizations commensurate with their interests. This study shows that they can invigorate their efforts with the added knowledge that it may make a difference in whether a student persists or not on the college level.

A second implication for school counselors concerns the predictive value of talking to the math teacher outside of class. Speaking with a teacher outside of class, especially if it involves material not understood, can be challenging for many students. It requires assertiveness and self-confidence and, in spite of encouragement by counselors, many students may fail to make such efforts. This study implies that school counselors should develop and maintain efforts at facilitating student interactions with teachers outside of class. Most teachers are dedicated professionals and want to help students succeed. School counselors know both the teachers and the students and therefore are in a unique position to broker relationships between the two. Comprehensive school counseling programs emphasize collaboration between the professional school counselor and other educators in order to promote academic achievement (ASCA, 2005b). If students can develop facility during high school for talking with teachers outside of class and seeking help for material they do not understand, this study shows that doing so may make a difference in their ability to persist on the college level. The first year of college can be intimidating for many students, and their help-seeking capacities for academic challenges can make a big difference in their becoming comfortable and engaged in college life. Therefore, school counselors should not tire in their efforts to promote a healthy interaction between students and teachers, especially with a teacher whose subject matter students might find challenging. For many students, this may be the math teacher, which may explain why the present study found that talking to a high school math teacher outside of class positively predicted persistence in college.

Implications for Community and Mental Health Counselors

Often encouraged by the school, many parents whose children are struggling seek counseling

services in the community. Poor academic performance can result in a variety of mental health problems, including learned helplessness, low self-esteem and poor self-efficacy (McLeod, Uemura, & Rohrman, 2012; Needham, Crosnoe, & Muller, 2004). A counselor's advocacy with the school becomes a significant part of the treatment plan because these students often get lost in the system (Holcomb-McCoy & Bryan, 2010). With the parents' permission, counselors can attend pupil personnel team meetings and talk with the school counselors and teachers. As mentioned several times, the interactions with teachers are an important predictor for college persistence. The first author works with many adolescents who attend large urban schools and struggle with math. He will often suggest talking to the teacher and getting extra help, a suggestion that is often unceremoniously dismissed. In some cases, through counseling and the use of role-plays, students can gain the necessary assertiveness and self-confidence to approach their teachers and discuss difficult subject matter. In other cases, students will continue to resist. After discussing the idea with the student, the counselor can call the school counselor and even the teacher to effectuate greater interactions with the students. More important than who initiates the interaction is the comfort level a student achieves from talking and meeting with teachers outside of class with the hope of receiving tutoring and mentoring (Bryan et al., 2012). With both the adolescent's and parents' permission, the senior author has often called teachers to discuss a struggling student's performance and alert them to the student's difficulty in asking for help. The phone call usually ends with an agreement that the teacher will reach out to the student. While it may be rare for the college professor to reach out, students who have had the experience of talking with teachers in high school about challenges in the classroom may be more likely to initiate such interactions on the college campus.

Implications for College Student Development Counselors

Recently, there have been calls for stronger links between secondary schools and institutions of higher education (Adams, 2013; Brock, 2010; Lautz, Hawkins, & Perez, 2005). In fact, President Obama's 2014 budget included grants for high schools to partner with higher education, business and non-profit groups to develop programs to prepare students for college and the workplace (Adams, 2013.) While strides have been made in the development of programs to support early college, dual enrollment programs, various articulation agreements and the integration of offering college level courses in high schools (Adams, 2013; Allen & Murphy, 2008; Fowler & Luna, 2009; Lautz, Hawkins, & Perez, 2005), these programs are mostly academic and do not address the social, non-academic and engagement issues proven to impact persistence (Pascarella & Terenzini, 2005). Thus, it would seem that promoting increased communication and collaboration between school and college student development counselors might provide the needed link for those working directly with students outside of the classrooms at all grade levels. For example, the University of Buffalo has responded by developing a program that includes advisory boards made up of school counselors, hosting the local school counselor association meeting and trainings on campus, and connecting with school counselor education programs (Bernstein, 2003).

Our results suggest the need to promote the importance of students' involvement in extracurricular activities as well as the interaction with faculty—particularly the math teachers. College student development counselors need to seek out opportunities to meet with high school students not only to recruit them to their respective schools, but to work with the school counselors and the students themselves to assist and encourage students in developing these important skills. Admissions counselors often have that very important initial contact with students and can build into their presentation a simple yet meaningful assessment to identify students who may not have the skills identified as positively impacting persistence. One implication from the present study would be to ask students about the number of hours spent in extracurricular activities and how well they know their teachers (particularly their math teacher). Such questions could give an indication

as to how developed those skills are at the moment and identify those students who need additional assistance. Professional development for teachers might also assist in increasing their understanding of the important and future consequences of interaction with their students as it relates to college persistence. Again, if college counselors can promote the interaction between teachers and students on the high school level, it may pave the way for these same students to interact and seek out help more easily from their college professors.

Limitations and Future Research

First, data-based research limits the investigator to items in the data base. The academic and social support variables, known to have a significant effect at the college level upon persistence, were composed of items that made these variables equivocal to the kind of support experienced in college. More reliable measures of academic and social support are needed to properly assess their predictive value on the high school level in regards to persistence. Secondly, the study is longitudinal and relies on data collected over a period of 4 years. As is the case with many longitudinal studies, not all ELS base-year participants were available several years later for the second follow-up, a year and a half after scheduled graduation from high school. Studies using continuous variables can rely on transformation methods available in statistical programs to replace missing data. However, this was not an option for the present study because it employed mostly categorical variables and causes the study to have missing cases, which reduces its randomness and generalizability. Thirdly, in the Discussion section, reference was made to the path toward college persistence and the special significance extracurricular activities might play in that pathway. Logistic regression can measure the significance and strength of individual predictors but cannot determine whether there is a significant difference among the predictors. Future studies, using path analysis, can shed more light on our findings that were achieved through simple regression and determine more specifically the path toward college persistence and the strength of relationship among various predictors.

Conclusion

This study investigated variables at the high school level that predict college persistence. Persistence was the dependent variable and measured by those who were still enrolled in a postsecondary institution a year and a half after graduation from high school. From the variables on the college level known to have a relationship to persistence, this study measured those same variables on the high school level to see if they predicted persistence in either a two-year or four-year institution. Six of the nine variables from the original model were not significant: academic support, social support, talks with English teacher outside of class, has gone to counselor for college entrance information, performed community/volunteer service, and number of hours worked. Two variables were strong enough to distinguish those who persisted from those who left: hours of extracurricular activities and talking with math teachers outside of class. The study discussed the implications for school, college student development and community mental health counselors in regards to the significance of these two variables.

Persistence is a major concern today among colleges. Implications of this study reveal how counselors can contribute to enhancing persistence by examining the relationship between factors on the high school level and persistence. The results of this study indicate that much more research needs to be done on this topic. Only a small number of our originally hypothesized predictors were supported as having a relationship to college persistence. Homework, talking to the math teacher and extracurricular activities contributed to about 9% of the variance, indicating that high school

persistence is explained by many more factors other than the ones found significant in this study. This study, however, is a first attempt at investigating how counselors working with high school youth might contribute to enhancing persistence on the college level. The authors hope that the findings that indicate the significance of some and the lack of significance of other variables will spur further interest in this topic. More so than attending college, graduating from college has become a major challenge today. If counselors can help construct a more solid foundation for persistence at the secondary school level, colleges will be in a better position to graduate qualified members for increasingly sophisticated and academically challenging work environments.

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