Learning Disabilities Research

Learning Disabilities Research & Practice, *24*(3), 122–131

Integration Factors Related to the Academic Success and Intent to Persist of College Students with Learning Disabilities

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Despite increased enrollment, outcomes such as grade point average (GPA), persistence, and graduation rates for college students with learning disabilities (LD) continue to lag behind those of their nondisabled peers. Reasons for the differences vary but may include academic and social integration, factors identified as important to the success of college students in general. This research investigated the relative influence of background characteristics, pre-college achievement, and college integration variables on the academic success and intent to persist of college freshmen and sophomores with LD. While academic and social integration were not unique predictors of college GPA, both integration variables were unique predictors of intent to persist. The findings suggest that beyond high school achievement and background characteristics, college experiences as captured by academic and social integration are promising constructs to help explain the persistence of college students with LD. Implications for future research and practices for high school and college personnel are discussed.

A college education is valued in American society as a means to increase opportunities for employment, earnings, and social capital (Tinto, 1993). Thus, it is encouraging that increasing numbers of individuals with disabilities, including those with learning disabilities (LDs), are attending colleges and universities after graduation from high school (Heiman & Precel, 2003; Houck, Asselin, Troutman, & Arrington, 1992; Mull, Sitlington, & Alper, 2001; Sharpe & Johnson, 2001). Based on data gathered from the 2000 National Postsecondary Student Aid Study (NPSAS: 04), the U.S. Department of Education reported approximately 11 percent of all undergraduates reported having a disability, and 7.1 percent of those were students with LD (U.S. Department of Education, 2006). According to the American Council on Education's 2001 report on college freshmen with disabilities, 2.4 percent of the college freshmen population at 4-year institutions self-disclosed as having LD. This accounts for 27,000 of the 1.1 million college freshmen at 4-year institutions in 2000 and is up from 1 percent in 1988 (Henderson, 2001). The number of actual college students with LD is even greater when one considers those individuals who have chosen not to disclose their disability through official channels (Rath & Royer, 2002; Wagner, Newman, Cameto, Garza, & Levine, 2005). According to data collected from the National Longitudinal Transition Study 2 (NLTS2), 9.7 percent of students with LD reported enrolling in 4-year institutions (Wagner et al., 2005).

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Several laws have contributed to the increase in the number of individuals with LD accessing higher education. The Individuals with Disabilities Education Act (IDEA) of 1990, amended in 2004, the Americans with Disabilities Act (ADA), and Section 504 of the Rehabilitation Act of 1973 each contain provisions that have stimulated the increase in attendance of students with LD at institutions of higher education. For example, IDEA requires transition planning and the participation of the student in such planning. Section 504 of the Rehabilitation Act and the ADA require that institutions receiving federal funding provide reasonable accommodations to college students who meet eligibility for having a disability. However, postsecondary outcomes of individuals with LD, including attendance at and graduation from institutions of higher education, continue to lag behind those of their nondisabled peers, particularly at 4-year institutions (Murray, Goldstein, Nourse, & Edgar, 2000; Rojewski, 1999; Vogel et al., 1998, 1999; Wagner & Blackorby, 1996; Wagner et al., 2005).

Several factors exist that may explain the poorer outcomes for individuals with LD in college settings. One explanation is the challenges inherent in having LD in an academic setting. For college students, the presence of LD may manifest in difficulty with written or spoken language resulting in a lower level of academic performance than would be expected (Gerber, 1998; NALLD, 1995; NJCLD, 1998; Skinner & Lindstrom, 2003). As well, problems with executive functioning can impact a college student's ability to organize, meet deadlines, and attend to the details of college assignments (Skinner & Lindstrom, 2003). College students with LD often have difficulty managing time, focusing on

academic tasks, telling others about their disability, and communicating needs to others (Smith, English, & Vasek, 2002). Beyond the classroom, LD may affect the way in which a college student interacts with his or her peers, as well as faculty members. For example, individuals with LD often exhibit lower self-esteem, higher anxiety, and demonstrate poor interpersonal skills, resulting in difficulty with self-advocacy and social interactions, necessary skills for success in college (Hoy et al., 1997; Reiff, 1995; Spekman, Godlberg, & Herman, 1992). The many ways in which LD may manifest in the life of a college student is further complicated by the differences a student faces between the high school and college environment.

Differences Between High School and College

As an individual with LD in high school, students are entitled to specific services under IDEA. According to this act, a student with LD has an individualized education plan (IEP) which outlines goals, objectives, and services specifically related to that student's education. There are requirements under the law regarding identification, timelines, implementation of services, modifications, and accommodations and the participation of the student, teachers, and parents. Further, student–teacher contact is typically greater in high school than in college and the student's parent often serves as a primary advocate for the student (Dalke & Schmitt, 1987; Smith et al., 2002). In sum, students with LD in high school may not understand their LD, possess self-advocacy skills, nor know their rights and responsibilities; yet they may still receive appropriate academic services and accommodations for their LD because of the system of support that exists under law in the K–12 setting (Brandt & Berry, 1991; Brinckerhoff, 1993; Harris & Robertson, 2001; Skinner & Lindstrom, 2003; Smith et al., 2002). However, that system ends abruptly upon completion of high school and entrance into the postsecondary setting.

In college, individuals with disabilities are protected under the ADA and Section 504 of the Rehabilitation Act. Unlike in high school, where students with LD are entitled to specific services and accommodations, in college these individuals are eligible for reasonable accommodations. That is, the system changes for students from one of entitlement to one of eligibility. Rather than depending on the school system and its representatives to ensure appropriate services and accommodations, an individual with a disability in the postsecondary setting must self-identify as a person with a disability and seek out appropriate accommodations. Such a shift in focus requires college students with LD to be self-aware, understand their rights and responsibilities, and possess self-advocacy skills in order to access the services and accommodations available to them (Brinckerhoff, 1993, 1996; Field, Sarver, & Shaw, 2003; Skinner & Lindstrom, 2003; U.S. Department of Education, 2007). In the postsecondary setting, students can no longer rely on parents or school personnel to ensure that their needs are met. Further, academic competition and social demands increase in college and can present unique challenges to students with LD (Dalke & Schmitt, 1987; Smith et al., 2002). To ensure that students with LD have equal opportunities to access, participate in, and succeed at college, research must be undertaken to understand the experiences of college students with LD and the factors that contribute to their academic success.

Past Research

One weakness of research on factors contributing to the success of college students with LD is the focus on isolated characteristics of the individual. As noted by Gregg, Hoy, King, Moreland, and Jagota (1992), "unfortunately, the affective, cognitive, and academic abilities of individuals with learning disabilities are quite often treated as separate domains having very little impact on each other" (p. 386). This reality is reflected repeatedly in research investigating the success of college students with LD. More often than not researchers attempting to explain what matters for the success of college students with LD choose to include in their studies only academic and cognitive factors (i.e., SAT scores, high school grade point average [GPA], and IQ scores) or affective factors (i.e., self-concept and self-worth) or behavioral factors (i.e., use of accommodations or study habits). However, a model that includes a combination of factors has yet to be tested. A further weakness with the research regarding students with LD in college is that researchers have often failed to consider contextual or interactional factors.

Whereas the LD literature has primarily focused on isolated characteristics, the success and retention literature on college students in general includes environmental factors and experiences as predictors, allowing for a broader understanding of the influences impacting success and retention. One major focus of researchers studying college students' success has been on GPA as the outcome variable. Because past academic performance, as measured by high school GPA or percentile rank and SAT or ACT scores, has consistently shown to be correlated with college GPA, researchers typically include these as control variables in their models (Wolfe & Johnson, 1995). Another avenue for expanding our understanding of academic success for college students with LD may be found in the retention literature, in which researchers reach beyond past academic achievement and characteristics of the individual (e.g., gender, race, socioeconomic status [SES]) as explanations for academic success and persistence and include constructs such as integration.

Tinto's Social Integration Model

The theoretical framework for the current study was based on an adaptation of Tinto's Student Integration Model and his constructs of academic and social integration (Tinto, 1975, 1993). Tinto proposed that students' experiences at college, primarily the extent to which they become socially and academically integrated, have a direct impact on their institutional and goal commitment and thus retention. Academic integration captures a student's satisfaction with his or her experiences with the academic systems at the university and his or her perceived intellectual development and growth. The extent to which a student views his or her

interpersonal relationships with faculty and peers on campus as promoting intellectual growth and development and influencing attitudes, beliefs, and values contributes to a student's academic integration. Social integration is defined as the interaction between the individual and the social systems of the institution, including peer groups, faculty and administrators, and extracurricular activities. The extent to which a student perceives others in the campus community as caring about him or her personally and having interest in him or her as an individual determines an individual's level of social integration.

Accordingly, students' experiences with the systems of the university, as well as their interactions and experiences with peers and faculty, determine the extent to which a student fits within the institution and the degree to which he or she will be socially and academically integrated into this new environment. These factors are considered determinants of the likelihood of a student remaining at the institution. Thus, the greater an individual's academic and social integration, the more likely he or she is to persist.

The results of studies focusing on academic and social integration have been mixed. For example, some researchers (Braxton & Brier, 1989; Strauss & Volkwein, 2004) have found that the level of academic integration has a direct impact on decisions to persist and can be used to discriminate between freshmen persisters and nonpersisters (Pascarella & Terenzini, 1980). Other research has yielded findings indicating that academic integration does not directly affect intent to reenroll for freshmen college students (Milem & Berger, 1997). Researchers have also documented that the level of social integration, above and beyond high school percentile rank, SAT scores, and other background characteristics, such as parental level of education, influences intent to reenroll and persistence (Braxton, Milem, & Sullivan, 2000; Milem & Berger, 1997; Pascarella & Terenzini, 1980, 1983; Strauss & Volkwein, 2004). Tinto's model is intended to explain persistence of students throughout college, rather than explain or predict academic achievement in the form of GPA. However, a few researchers have recognized and studied the impact that constructs within Tinto's model may have on GPA for college students (Bean & Kuh, 1984; Boulter, 2002; House, 2002). These authors found that constructs such as academic and social integration may be useful for predicting GPA, in addition to explaining student persistence.

Although Tinto's constructs of academic and social integration have never been tested with students with LD, experts in the field of LD have long promoted concepts related to academic and social integration as key to the academic success of college students with LD. For example, Siperstein (1988) noted that students with LD often cite difficulties in establishing appropriate relationships with faculty and problems with social isolation in college as barriers to their success. Researchers (Cosden & McNamara, 1997; Ryan, Nolan, Keim, & Madsen, 1999) have also found that college students with LD report needing more support from friends and campus organizations than their nondisabled peers. Experts have suggested that college students with LD would benefit from study skill development, as well as self-advocacy and social skill development in order to better establish positive relationships with faculty and peers and be better prepared for the demands of college (Brandt & Berry, 1991; Brinckerhoff, 1993; Field et al., 2003; Hoffman, 2003; Skinner & Lindstrom, 2003; Yuen & Shaughnessy, 2001). Thus, the inclusion of academic and social integration in a model to predict GPA and intent to persist for college students with LD is warranted.

Current Study

The purpose of this investigation was to study the impact academic and social integration have on the academic success and intent to persist of college freshmen and sophomores with LD, while controlling for background characteristics and precollege achievement variables, by (1) measuring the relative contribution of academic integration and social integration on college GPA and (2) measuring the relative contribution of academic integration and social integration on intent to persist. The use of intent to persist as a proxy of persistence is well documented in the research literature as a valid indicator of actual student persistence (Bean, 1980; Braxton, Vesper, & Hossler, 1995; Cabrera, Nora, & Castaneda, 1993; Milem & Berger, 1997). For the purpose of this study, academic success was defined as cumulative GPA. Figure 1 illustrates the hypothesized model of academic success and intent to reenroll for college students with LD. The predictor variables for this model fall into three categories: those which reflect personal background characteristics, variables that represent past academic achievement, and finally those which are based on the interaction the individual has with the college environment. It was hypothesized that the level of academic and social integration would be a significant predictor of GPA and intent to persist for college students with LD, above and beyond that of background characteristics and past academic achievement.

METHOD

Participants and Measures

The participants for this study were 97 college freshmen and sophomores with LD attending a large, 4-year public institution in the southwestern United States. Students with LD who wish to be eligible to receive reasonable accommodations under the ADA and Section 504 of the Rehabilitation Act of 1973 must be registered with the Disability Resource Center (DRC) on campus. Per university policy, students must provide a current (within 3 years) psychoeducational evaluation conducted by a professional diagnostician. The evaluation must include comprehensive measures of aptitude, achievement, and cognitive/information processing. Scores from approved measures must be included in the documentation. It must be demonstrated within the documentation that the LD limits one or more major life activity, including learning, currently and substantially. In addition to being registered with the DRC, all but one of the participants were enrolled in a fee-for-service program on campus designed to assist students with learning challenges at the university. Services for students enrolled in this program include individual and small group content tutoring, mentoring,

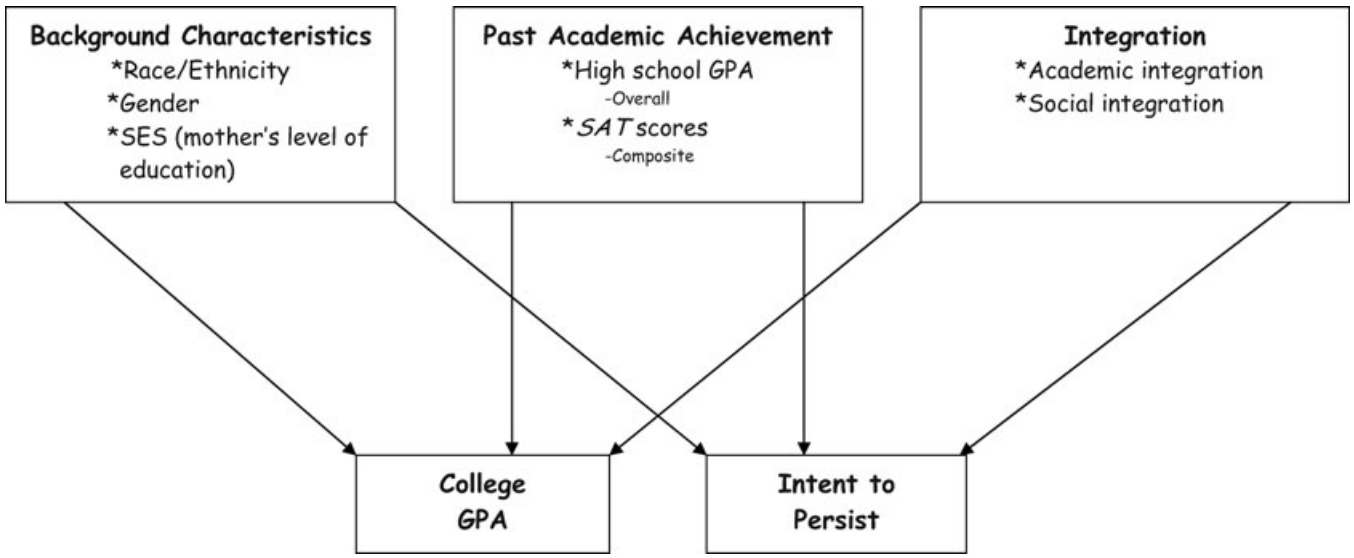

FIGURE 1 Hypothesized model of academic success for college students with learning disabilities.

consultations with a writing skills coordinator, access to a private computer lab, and assistance in the form of workshops and seminars targeted at improving skills related to college success.

Participants were primarily White (89 percent), over half of the participants were male (59 percent), and the majority reported their mother had at least a college degree (76 percent). The age range of the students was from 18 to 22 years; 60 percent were freshmen and 40 percent sophomores. Seventy percent of the participants reported living on campus in dormitories or fraternity or sorority housing, while 26 percent lived off campus alone or with roommates, and the remaining 4 percent resided with their parents. Based on available data from the university, the research sample had a higher percentage of men and a greater proportion of Whites than are represented at the university (59 percent vs. 47 percent and 89 percent vs. 64 percent, respectively).

Six measures were used for this study. Three of these (entrance exam scores [SAT and ACT], high school GPA, and college GPA) were collected from university records. Although the SAT is the most commonly taken entrance exam by students at this university, 27 percent ($n = 26$) of the participants in this study took the ACT rather than the SAT. ACT scores were converted to a SAT scale in order to perform statistical analyses. The practice of converting SAT and ACT scores is widely accepted in higher education admissions (College Board, 1999; Dorans, 1999). In order to achieve maximum reliability, the same concordance table used by the university was used in this study. Descriptive statistics for past academic achievement variables are presented in Table 1. The fourth measure was a researcher-designed questionnaire which captured demographic information. The questionnaire asked participants to provide the following information: (1) age, (2) gender, (3) year in school, (4) mother and father's level of education, (5) race/ethnicity, (6) major, (7) place of residence, (8) age or grade of initial diagnosis, (9) area(s) most affected by LD, and (10) presence or absence of ADD (attention deficit disorder) or ADHD (attention deficit hyperactivity disorder) diagnosis. Descriptive statistics for the background characteristics used in this study are presented in Table 2.

TABLE 1
Descriptive Statistics for Continuous Variables

Variable	*Mean*	*SD*	*Range*	*Skewness*	*Kurtosis*
Integration measures					
Academic integration	29.38	3.47	18.00–39.00	.060	1.322
Social integration	30.00	4.30	11.00–40.00	−.761	3.665
SAT[a]	976.00	166.00	620.00–1530.00		
HS GPA	3.06	0.41	2.27–3.98		
College GPA	2.52	0.62	0.00–3.67		
Persistence[b]	4.50	0.91	2.00–5.00	−1.690	1.576

[a]SAT scores include transformed ACT scores.
[b]This score is an average of the three intent to persist questions.

The *Freshman Year Survey* (*FYS*; Milem & Berger, 1997) was used to measure academic and social integration. This scale was developed by Milem and Berger as a perceptual measure and drawn directly from earlier instruments (Pascarella & Terenzini, 1980) used to test Tinto's model. Academic and social integration have been measured using the *FYS* scale or adaptations of the scale in a number of studies (Berger & Milem, 1999; Braxton et al., 1995, 2000; Milem & Berger, 1997). The academic and social integration scale found on the *FYS* includes a total of 18 items. There are 10 items assessing academic integration and 10 items assessing social integration, with 2 items overlapping on the scale. The measure is a self-report, in which students are asked to indicate on a four-item Likert scale how much they agree with statements regarding their own academic and social

TABLE 2
Descriptive Statistics for Nominal and Ordinal Variables

Variable	*f*/%
Race/ethnicity	
Black (not Hispanic)	2/2.1
White	86/88.7
Latino/a	5/5.2
Asian or Pacific Islander	2/2.1
Other	2/2.1
Gender	
Male	57/58.8
Female	40/41.2
SES (Mother's level of education)	
Completed 8th grade	1/1.0
Completed high school	8/8.2
Some college	14/14.4
College degree	45/46.4
Graduate degree	29/29.9

SES = socioeconomic status.

integration at the university. The items directly assess assertions found in Tinto's theory. For example, Tinto argues that greater levels of informal faculty contact lead to increased social integration at the university (Tinto, 1975, 1993). One of the items found on the social integration subscale is "Since coming to the university I have developed a close, personal relationship with at least one faculty member." As well, Tinto (1975) frames academic integration to include an individual's intellectual development during college, including identification with the norms of the academic system. Items on the academic integration subscale reflect this construct. An example of such an item is "My academic experience at this university has had a strong positive influence on my intellectual growth and interest in ideas." Reliability data indicate an $\alpha = .74$ for the academic integration subscale and $\alpha = .72$ for the social integration subscale (Berger & Milem, 1999). The reliability coefficient for this study was .64 for the academic integration subscale and .73 for the social integration subscale.

Finally, intent to persist from the spring semester to the fall semester was measured with a composite of three items found on the *FYS*. The α estimate for this scale was reported as .89 in previous studies (Braxton et al., 2000); for this study the α coefficient was .94.

Data Analysis

A descriptive, nonexperimental design was used to examine the influence of academic and social integration on the academic success and intent to persist of college freshmen and sophomores with LD, controlling for background characteristics and past academic achievement. Data analysis included descriptive statistics and intercorrelations of all variables. As well, independent *t* tests and chi-square analyses were conducted to determine the existence of group differences between those who took the ACT versus the SAT, prior to converting ACT scores to SAT scores for further data analysis.

Hierarchical multiple regression analysis was used to answer the research questions. For each analysis on college GPA and intent to persist, the predictor variables were entered in a stepwise fashion. In the first analysis the first block of variables entered was background characteristics (race, gender, SES [mother's level of education]), followed by a block of past academic achievement (SAT composite and overall high school GPA), academic integration entered as the third block, and social integration as the fourth block. In the second analysis, social integration was entered as the third block and academic integration as the fourth block.

RESULTS

Descriptive Analyses

On the *FYS* scale, social integration and academic integration scores ranged from a possible low of 10 to a possible high of 40. In each case, the higher the score, the greater the perceived social or academic integration. The persistence measure included three items on a five-point Likert scale. Once averaged, possible persistence scores ranged from 1 to 5. A higher score indicated a participant's self-report of a greater likeliness to persist at the present university the following fall semester. Complete descriptive statistics for the integration and persistence measure are presented in Table 1.

A correlation analysis was conducted to determine the relationship between background characteristics, previous academic achievement, integration variables, and college GPA and intent to persist. In addition, self-reported ADHD status, age, and year in school were included in the correlation analyses to determine the presence of any relationship that required further investigation. Intercorrelations are presented in Table 3.

Significant correlations included a positive relationship between academic integration and social integration ($r = .647$). Academic integration was also significantly, negatively correlated with SAT scores ($r = -.214$). Additionally, intent to persist was significantly, positively correlated with academic integration ($r = .399$), social integration ($r = .460$), and college GPA (.219) and significantly, negatively correlated with SAT scores ($r = -.314$). There was a significant correlation between college GPA and high school GPA ($r = .264$) and college GPA and being female ($r = .344$). A self-reported ADHD diagnosis was significantly, negatively correlated with high school GPA ($r = -.252$) and significantly, positively correlated with SAT scores ($r = .218$).

Prediction of College GPA

Regression results for college GPA are presented in Table 4. In both analyses, background characteristics accounted for all of the significant variances in college GPA. Academic and social integration did not individually, or collectively, account for significant variance in college GPA above and beyond background characteristics and past academic achievement. The full model accounted for 19 percent (adjusted $R^2 = .13$) of the variance in college GPA, $F(7, 89) = 3.045$, $p < .01$.

TABLE 3
Intercorrelations among Predictor and Criterion Variables

Variables	*Gender*	*SES*	*H.S. GPA*	*SAT*	*Total. Integ.*	*Academic Integ.*	*Social Integ.*	*College GPA*	*Intent to Persist*	*ADHD*	*Age*	*Year*	*Housing*
Race/ethnicity[1]	.035[7]	.217	.058	.062	.176	.181	.167	.059	−.029	.189[7]	−.082	.028[7]	.257*,[7]
Gender[2]	–	.168	.195	−.118	−.011	−.014	.010	.344**	.060	−.061[7]	−.203*	−.174[7]	.201[7]
SES[3]	–	–	.218*	.051	.055	.056	.051	.153	−.028	.093[7]	−.084	.061[7]	.197[7]
H.S. GPA	–	–	–	−.164	.129	.121	.128	.264**	.150	−.252*	.170	.204*	.262[8]
SAT	–	–	–	–	−.191	−.214*	−.140	−.081	−.314**	.218*	−.167	−.013	.194[8]
Total integ.[4]	–	–	–	–	–	.875**	.888**	.138	.458**	−.065	−.011	.173	.174[8]
Academic integ.	–	–	–	–	–	–	.647**	.192	.399**	.089	−.016	.177	.216[8]
Social integ.	–	–	–	–	–	–	–	.113	.460**	−.005	.000	.157	.105[8]
College GPA	–	—	–	–	–	–	–	–	.219*	−.067	−.017	.128	.059[8]
Intent to persist	–	–	–	–	–	–	–	–	–	−.055	−.053	−.105	.174[8]
ADHD[5]	–	–	–	–	—	–	–	–	–	–	−.053	.004[7]	.031[7]
Age	–	–	–	–	–	–	–	–	–	–	–	.590**	.466[8]
Year[6]	–	–	–	–	–	–	–	–	–	–	–	–	.682**,[7]

[1]0 = Minority, 1 = White; [2] 0 = male, 1 = female; [3]mother's education: 3 = High School Degree or less, 4 = some college, 5 = college degree, 6 = some graduate school, 7 = graduate degree; [4]composite of academic and social integration measures; [5]0 = no attention deficit hyperactivity disorder (ADHD), 1 = diagnosed with ADHD; [6]0 = freshman, 1 = sophomore; [7]phi correlation;[8]eta correlation; SES = socioeconomic status.
*$p < .05$; **$p < .01$.

TABLE 4
Hierarchical Multiple Regression Analysis on College GPA

Variables	*B*	*SE B*	*β*	*t*	R^2
Academic Integration on College GPA					
Step 1					.13**
Gender	.384	.124	.31**	3.096**	
Race	.020	.192	.01	0.103	
SES	.026	.048	.05	0.544	
Step 2					.16**
SAT	.007E-02	.000	.02	0.179	
H.S. GPA	.265	.152	.18	1.745	
Step 3					.17**
Social Integration	−.007	.018	−.05	−0.374	
Step 4					.19**
Academic Integration	.037	.023	.20	1.598	
Social Integration on College GPA					
Step 1					.13**
Gender	.384	.124	.31**	3.096**	
Race	.020	.192	.01	0.103	
SES	.026	.048	.05	0.544	
Step 2					.16**
SAT	.007E-02	.000	.02	0.179	
H.S. GPA	.265	.152	.18	1.745	
Step 3					.19**
Academic integration	.037	.023	.20	1.598	
Step 4					.19**
Social integration	−.007	.018	−.05	−0.374	

SES = socioeconomic status; *$p < .05$; **$p < .01$.

TABLE 5
Hierarchical Multiple Regression Analysis on Intent to Persist

Variables	*B*	*SE B*	*β*	*t*	R^2
Academic Integration on Intent to Persist					
Step 1					.01
Gender	.077	.169	.04	0.398	
Race	−.312	.260	−.11	−1.198	
SES	−.049	.065	−.07	−0.751	
Step 2					.11
SAT	−.001	.001	−.21*	−2.223*	
H.S. GPA	.149	.207	.07	0.722	
Step 3					.29**
Social integration	.074	.025	.35**	2.997**	
Step 4					.30**
Academic integration	.038	.031	.14	1.213	
Social Integration on Intent to Persist					
Step 1					.01
Gender	.077	.169	.04	0.398	
Race	−.312	.260	−.11	−1.198	
SES	−.049	.065	−.07	−0.751	
Step 2					.11
SAT	−.001	.001	−.21*	−2.223*	
H.S. GPA	.149	.207	.07	0.722	
Step 3					.23**
Academic integration	.038	.031	.14	1.213	
Step 4					.30**
Social integration	.074	.025	.35**	2.997**	

SES = socioeconomic status; *$p < .05$; **$p < .01$.

Prediction of Intent to Persist

Regression results for intent to persist are presented in Table 5. It was found that background characteristics accounted for only 1 percent of the variance of intent to persist, $F(3, 93) = .194$. While past academic achievement accounted for an additional, significant 10 percent of the variance beyond background characteristics, $F\Delta(2, 91) = 5.326, p < .01$, the model including only background characteristics and past academic achievement was not significant, $F(5, 91) = .055$. Social integration accounted for a significant 18 percent of the variance in intent to persist, above and beyond that accounted for by background characteristics and past academic achievement, $F\Delta(1, 90) = 22.756$, $p < .01$. Academic integration did not significantly add to the model. When academic integration was entered third and social integration entered last, academic integration accounted for a significant 12 percent of the variance in intent to persist, beyond that

accounted for by background characteristics and past academic achievement, $F\Delta(1, 90) = 14.114$, $p < .01$. Entered last, social integration added an additional, significant 7 percent to the total variance in intent to persist, $F\Delta(1, 89) = 8.981$, $p < .01$. Because of the shared variance of academic and social integration, upon entry of social integration into the model, academic integration was no longer independently significant. The full model that included the social and academic integration variables accounted for 30 percent (adjusted $R^2 = .25$) of the variance in intent to persist, $F(7, 89) = 5.486$, $p < .01$.

DISCUSSION

The primary purpose of this investigation was to study the influence academic and social integration have on the academic success and intent to persist of college freshmen and sophomores with LD, while controlling for background characteristics and past academic achievement. This study may be the first to apply integration as a factor in a model of academic success and persistence for college students with LD.

It was hypothesized that integration would be useful for explaining academic performance and intent to persist. As evidenced by the results of the regression analyses showing that none of the integration variables added significant unique variance to the models predicting college GPA, the influence of integration on college GPA for students with LD was not supported in the present study. As theorized by Tinto (1975), the current findings suggest that college GPA is more likely a component of academic integration, rather than predicted by integration.

A different pattern of results existed for the relationship between integration and intent to persist. As expected, integration variables were consistently significant predictors of intent to persist. When examined as separate blocks, academic integration accounted for a significant amount of variance above and beyond background characteristics and past academic achievement ($\Delta R^2 = .12$), but did not add significantly above and beyond social integration ($\Delta R^2 = .01$). Conversely, social integration was significant above and beyond background characteristics and past academic achievement ($\Delta R^2 = .18$), as well as above and beyond academic integration ($\Delta R^2 = .07$). These findings indicate that, while academic integration is important for predicting persistence of college students with LD, social integration may be most powerful. The results of this study parallel past research demonstrating that social integration trumps academic integration in its effect on institutional commitment, intent to return, and persistence (Berger & Milem, 1999; Braxton et al., 1995; Milem & Berger, 1997; Strauss & Volkwein, 2004) and extends the findings to a different population. It is important to note that other researchers have reported opposite results with unselected samples, finding that academic integration has greater effects than social integration on institutional commitment, intent to return, and persistence (Braxton & Brier, 1989; Cabrera et al., 1993; Pascarella & Terenzini, 1983). It may be that, because students with LD have greater difficulty with the academic arena of college than do students without LD, persisters with LD compensate by relying more on their social support systems.

Unexpectedly, whereas background characteristics accounted for a significant amount of the variance in college GPA, background characteristics, as a block, were not significant predictors of intent to persist. The finding that background characteristics and past academic achievement were not significant in the regression equation are inconsistent with Tinto's theory and previous research documenting the effects of background characteristics and past achievement on persistence and intent to persist (Bean, 1980; Cabrera et al., 1993; Kahn & Nauta, 2001; Pascarella & Terenzini, 1980; Strauss & Volkwein, 2004). A plausible explanation for the null findings regarding the effects of background characteristics and past academic achievement in this study may be the nature of the sample. Participants were mostly White (89 percent), with highly educated mothers (79 percent college degree or higher), suggesting restricted ranges for these variables. Further, as students with LD who have typically struggled in school and receive current academic assistance and accommodations, past academic achievement variables may be less representative than more current cognitive and behavioral variables of student ability and achievement in the present setting. Finally, as discussed earlier, researchers in the area of LD have documented that students with LD typically have weaker precollege academic achievement scores and that these scores are not good predictors of college GPA. The findings in the present study add to the literature suggesting that precollege achievement factors are not good predictors of persistence for students with LD.

In addition to the statistical significance of these findings, the results have practical significance. Over half of the explained variance in the model predicting intent to persist was accounted for by integration variables. That is, while the full model containing academic and social integration as individual predictors accounted for 30 percent of the variance, academic and social integration combined accounted for 19 percent of the variance beyond background characteristics and past academic achievement. These findings reveal that, for students with LD, being integrated into the university may trump traditional indicators of persistence such as high school GPA and entrance exam scores.

In sum, integration was a significant predictor of intent to persist for this sample of college students with LD. However, integration factors do not have the same impact on college GPA for this sample as reported for college students in general. While the total R^2 for the models predicting college GPA did not exceed .19, the models predicting intent to persist accounted for between 28 percent and 30 percent of the variance, akin to what most full models in previous research have been able to explain.

Findings from the present study are also consistent with previous research which has demonstrated a positive correlation between high school GPA and college GPA with unselected samples (Bean & Kuh, 1984; Beck & Davidson, 2001; Tross, Harper, Osher, & Kneidinger, 2000; Wolfe & Johnson, 1995). However, in the current study, high school GPA was more weakly correlated with college GPA than in much of the previous literature. Whereas the correlation in this study was found to be $r = .26$, past research has shown

stronger correlations between the two variables, such as $r = .37$ (Beck & Davidson, 2001); $r = .40$ (Wolfe & Johnson, 1995); and $r = .50$ (Tross et al., 2000). The lower correlation found in this study may be attributed to the sample in which a restricted range of scores for GPA may limit the magnitude of the correlation coefficient.

Another unique finding in this study is that SAT score was neither correlated with high school GPA (see Table 3), nor was it individually a significant predictor of college GPA (see Table 4). Previous research with unselected samples has consistently shown a positive relationship between high school GPA and entrance exam scores (Beck & Davidson, 2001; Kahn & Nauta, 2001; Tross et al., 2000; Wolfe & Johnson, 1995). As well, SAT scores typically present as a significant predictor of college GPA (Beck & Davidson, 2001; Tross et al., 2000; Wolfe & Johson, 1995). The unique findings that high school GPA and SAT scores were not significantly correlated and that neither was individually, nor collectively, above and beyond background characteristics, a significant predictor of college GPA may be a reflection of the sample being studied. Students with LD struggle academically and often enter college with weaker past academic achievement scores (Vogel & Adelman, 1990, 1992). These results are consistent with research in the area of LD in which it has been concluded that the construct of past academic achievement, as measured by traditional indicators such as high school GPA and achievement scores, is not a valid predictor of academic success of students with LD in college (Murray & Wren, 2003; Vogel & Adelman, 1993).

An additional interesting result was the statistically significant, negative correlation between SAT scores and intent to persist. This finding was not consistent with past research with unselected samples and again may reflect the unique nature of this sample. It has been documented that individuals with LD often perform poorly relative to their peers on college entrance exams (Vogel & Adelman, 1990, 1992). Because participants were not asked what types, if any, accommodations they were eligible for or used while taking the SAT or ACT, no conclusions can be drawn for this sample about the interaction of LD, accommodations, and entrance exam scores.

Limitations

This study has several limitations. First, students with LD in this study self-identified to the university's DRC. Additionally, all but one of the participants in this sample participated in a fee-for-services program on campus. Many services provided to this sample are not unique to this college environment; for example, 82 percent of 4-year public institutions provide tutoring to students with disabilities, 80 percent adaptive technology, and 83 percent registration assistance (NCES, 2000). However, according to NLTS2 data, only 35.4 percent of students with disabilities self-identify and receive accommodations at postsecondary institutions (Wagner et al., 2005). Thus, the participants in this study represent a population of college students with LD who, based on their self-identification and use of extended campus resources, likely were more motivated and possessed a higher level of self-advocacy and/or have parents or others more actively involved in their acquisition of academic assistance than students with LD who do not identify to campus personnel. This aspect of the sample limits generalizability to broader samples of young adults with LD who enter college.

A second limitation regarding the sample is the number of participants. In total, 97 students participated in this study; power estimates indicated that a sample size of 102 was ideal for detecting a .10 increase in R^2, with an alpha of .05 when adding the two integration variables to a model containing a block of background characteristics and a block of past achievement variables. More participants would have yielded more power and a greater ability to detect an incremental change in the R^2 as variables were added to the models.

Implications for Research and Practice

Given the findings and limitations of the current study, there are a number of potential directions for future research. First, future studies should aim to increase the sample size and recruit participants from a variety of colleges and universities, representing institutions of varied sizes, type, and geographic location. This would allow for greater generalizability of the findings. Additionally, researchers should seek to identify why social integration is more important than academic integration for intent to persist for college freshmen and sophomores with LD. An interesting question to be answered regarding a sample such as this one, in which the students had access to services beyond "reasonable accommodations," is how involvement in such a program promotes or inhibits academic and social integration. That is, are students in such a program more integrated as a result of the services they receive and their contact with support staff and other students with LD, or conversely, are they less integrated because they are insulated and do not need to make as much contact with faculty and outside peers in a setting away from where they receive services?

Extensions of this study should also include additional constructs in the model that may more fully explain persistence and college GPA for students with LD. A promising 30 percent of the variance in intent to persist was explained by background characteristics, past academic achievement, and integration, leaving 70 percent of the variance still unaccounted for. Constructs that are relevant to the daily lives of individuals with disabilities, such as self-advocacy, self-determination, and self-awareness, should be considered for inclusion in future models.

The lack of significant findings regarding the impact of integration or past academic achievement variables on college GPA also gives way to interesting questions regarding what factors do impact the academic success of college students with LD. As this study and others have failed to find a link between high school achievement variables and college GPA for students with LD, future research should look at factors that may be more salient for students with LD such as transition planning, high school IEP goals, self-advocacy, and behaviors during college. Because of the infancy of research focusing on college students with LD, multitudes of variables have yet to be explored. However, it is vital that researchers in this area integrate variables from multiple domains (e.g.,

behavioral, cognitive, academic, affective, social), rather than study any one domain in isolation.

With the advent of Section 504 of the Rehabilitation Act and the ADA in the late part of the last century, programs for students with disabilities, including those with LD, have increased in number on college campuses throughout the country. In addition to the guarantee of appropriate accommodations, many colleges and universities offer additional services to students with LD. Although the types, quantity, and quality of programs vary, services are typically academic in nature. Based on findings in the present study, college personnel should consider the impact academic *and* social integration may have on students with LD. As colleges and universities seek to increase persistence for students with LD and develop programs for that purpose, areas to think about include ways to promote the integration of students with LD. Programs in which students can connect with other students, staff, and faculty in meaningful ways, thereby increasing integration, should be considered. Faculty/student mentoring programs, freshman year seminar classes, cohorts, and learning communities are examples of programs that may hold promise for promoting integration.

There are also implications from this study for high school personnel, parents, and students with LD. IDEA (2004) requires the development of appropriate, measurable postsecondary goals. Those involved in transition planning for college-bound individuals with LD should consider the ways in which a student's ability to become academically and socially integrated at college will impact the achievement of their goals. Thus, school personnel might consider curriculum which promotes self-advocacy, self-determination, and skills which empower students to connect with peers and faculty. Preparing students to interact with faculty within and outside of the classroom setting may serve to prepare students for college much in the same way preparing students academically does.

In addition to the efforts made to academically prepare students with LD for college, the results of this study indicate that students should be prepared to make important social connections with peers, as well. Often the first advice given to a student who may struggle in school is to scale back on extracurricular activities. The significant finding that social integration is a strong predictor of intent to persist in college for students with LD should be a reminder that making social connections, balanced with academic efforts, may increase a student's likeliness to persist in college.

ACKNOWLEDGMENTS

I wish to thank Dr. Deborah Speece for her support and contributions throughout the research and writing process. I also wish to thank the university personnel who facilitated data collection, as well as each of the students who participated in this study.

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