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Academic Support and College Success for Postsecondary Students with Learning Disabilities

The relationship between degree of academic support center use and college success was examined in a population of 262 college students with learning disabilities. Five years of attendance data and graduation rates were examined and submitted to discriminant function analysis to evaluate the predictive influence of academic support center use on college student outcomes. Results indicated that students who had higher levels of attendance in an academic support center had higher overall grade point averages and higher rates of graduation. That is to say, students with learning disabilities who attended learning support centers regularly were more likely to have higher grades and graduate college than those who did not.

The number of students with learning disabilities who graduate from high school and attend postsecondary education has increased steadily over the past 20 years (Foley, 2006). In 2000, 9% of students attending college reported a disability. Within this group, the category of disability most often reported was learning disability (Henderson, 2001; Horn, Peter, Rooney, & Malizio, 2002). The

transition from secondary to postsecondary education can be difficult for students with learning disabilities (Estrada, Dupoux, & Wolman, 2006; Satcher, 1992; Stage & Milne, 1996; Wilczenski & Gillespie-Silver, 1992). Students who have become accustomed to comprehensive instruction in a special education environment or who have received individualized accommodations in a regular classroom are likely to experience challenges in a less structured, more challenging higher education environment (Vogel, 1993). Often, these students may not be prepared for the level of diligence, self-control, self-evaluation, decision-making, and goal setting that success in college requires (Field, Sarver, & Shaw, 2003).

Students with disabilities require special support in order to integrate academically and socially to college life (Kowalsky & Fresko, 2002). The types of services recommended can vary widely from student to student, but certain forms of support, such as testing accommodations, priority registration, counseling, and self-advocacy training are critical to student success in college (Brinckerhoff, 1994; Greenbaum, Graham, & Scales, 1995; Vogel & Adelman, 1992). Without proper support, high percentages of students with learning disabilities drop out of high school, do not seek admission to postsecondary education, and are not prepared to succeed in higher education (Estrada et al., 2006; Horn, Berktold, & Bobbit, 1999).

Academic support programs commonly provide services to undergraduate students (Kuo, Hagie, & Miller, 2004). The number of support programs available to college students with learning disabilities is expanding each year and the services provided vary considerably from institution to institution (Mull, Sitlington, & Alper, 2001). Often, these services are offered by academic skill centers that provide support in specific areas, such as writing, note taking, or test preparation (Kuo et al., 2004). However, more comprehensive programs designed to foster independence through enhanced self-esteem, self-advocacy, and self-determination have been created in recent years. As a result, a continuum of support services is now available to students with learning disabilities, ranging from compliance programs that meet the requirements established by law to comprehensive programs that offer a high degree of structure and support (Troiano, 1999; Vogel, 1993).

To investigate the connection between learning support and college success, it was hypothesized that college students with learning disabilities who consistently attend academic support centers will have higher academic success than those who attend less often or who do not attend at all. College success is defined operationally for this study in two ways: (a) graduation from the college and (b) higher grade point average (GPA).

The learning support in this study took place at the Learning Resource Center (LRC) of a small, private, liberal arts college in the eastern United States. The services of the LRC are available to students with diagnosed learning disabilities or attention deficit hyperactivity disorder. The program offers three levels of academic support to students: (a) Comprehensive (Level One), (b) Enhanced (Level Two), and (c) Entitled (Level Three). Comprehensive Support includes four hours of individual and small-group work each week with an assigned learning specialist and writing specialist. Enhanced Support includes two hours of individual and small-group work each week with an assigned learning specialist or writing specialist. Entitled Support includes student-initiated appointments with a member of the staff on an 'as needed' basis.

The program is designed to provide an individualized support plan for each student and to move students through the three levels of academic support at a pace that is appropriate for each student. The learning and writing specialists focus on eight areas of support: textbook reading, note taking, test preparation, test taking, writing strategies, research skills, time management, and self-advocacy. In addition to the individual and small-group work with LRC staff, at all three levels of support students receive the testing accommodations and program modifications to which they are entitled by law.

Method

Participants

The population consisted of 262 students in a small, private northeastern college. The population was composed of 87 females and 174 males. Ethnicity of the students was not a recorded variable and, therefore, was not available for analysis. At this college, approximately 30% of the population has a documented learning disability. Graduation rates from the 2 and 4-year programs ranged between 50% and 70%. This entire population participated in the college's Learning Resource Center at one of the three levels of support. All the participants qualified for educational accommodations due to a documented learning disability.

Data Analysis Procedures

This study evaluated the attendance of 262 college students collected over five years in a collegiate learning center. Five years of data were analyzed for this research because this was the maximum length of time for which these data had been collected. Attendance levels were compared with academic outcome data to determine if degree or level of attendance in the support center was a predictor of graduating from college. Examining these data sought to answer the question: Would

students who have better attendance at scheduled appointments also have better collegiate outcomes when compared to those students whose attendance was lower than prescribed compliance levels? Although preliminary testing indicated that there were no differences between men and women within the analysis, gender was added to evaluate its predictive influence in the model, which is discussed below.

The data utilized in this study were originally collected as a regular function of the college's Learning Resource Center (LRC). The rate of attendance was calculated by dividing total appointments attended by total appointments scheduled, over the academic career of each student. The results of this calculation were assigned to an attendance scale ranging from 0 (did not attend any appointments) to 10 (attended 100% of scheduled visits). This method allowed for equality among the three possible levels of LRC use. By examining percentage of attendance, no difference would be indicated between a student who was scheduled at the center three times a week and therefore compliant and a student who was scheduled for one appointment a week and compliant. This process provided for analysis levels of consistency rather than levels of need for the analysis procedures (see Table 1).

Table 1
Rate of Attendance in Learning Resource Center

Rate of attendance (%)	n	Percentage
0	07	2.7
1-10	06	2.3
11-20	16	6.1
21-30	25	9.5
31-40	22	8.4
41-50	31	11.8
51-60	33	12.6
61-70	30	11.5
71-80	22	12.2
81-90	31	11.8
91-99	37	14.1
100	02	0.8

These data were analyzed in two ways. Discriminant function analysis was used to analyze the categorical predictor with categorical outcome variables to assess the predictive value of learning center use. As mentioned, the outcome variable was college success (whether the student

graduated or did not graduate from college, and what grade point average was achieved). Next, the data were split by levels of attendance, and then cumulative grade point averages (GPA) were examined within the categories. The attendance groupings ranged from 0% to 100%. The data were then collapsed, as mentioned, into groups of 10% ranges. Each group represents a 9-point percentage range such as "attended between 10-19% of appointments, between 20-29% of appointments" and so forth.

Results

Because the predictor and criterion variables were categorical in nature, use of discriminant function analysis was needed to determine whether two predictors (percentage of time spent in an academic learning support center, and gender) could predict college graduation in a population of students with learning disabilities. This type of analysis was also useful in suggesting to future students that attendance compliance predicts academic success. The overall Wilks's lambda was significant, $\Lambda = .83$, $\chi^2\,(2, N = 261) = 46.78$, $p < .001$, indicating that the predictors significantly differentiated between the graduation and non-graduation groups.

Table 2 presents the within-groups correlations between the predictors and discriminant function, as well as the standardized weights. Based on these coefficients, time spent in an academic learning support center demonstrated the strongest relationship with the discriminant function while gender showed a weaker relationship. On the basis of the results presented in Table 2, the first discriminant function has been labeled learning support.

Table 2
Standardized Coefficients and Correlations of Predictor Variables with the Discriminant Function

	Correlation coefficients *with discriminant function*	Standardized coefficients *for discriminant function*
Predictors	Function 1	Function 1
Attendance at Learning Center	.95	.92
Gender	.41	.33

The means on the discriminant function are consistent with this

interpretation. The individuals who graduated (M = .70) had a higher mean on the learning support dimension, while those individuals who did not graduate (M = -.28) had a lower mean. When we tried to predict college graduation in this population, we were able to successfully classify 74% of the individuals in our population. In order to take into account chance agreement, we then computed a kappa coefficient and obtained a value of .32, a fair value indicating that the results were not likely to have occurred by chance. Finally, to assess how well the classification procedure would predict graduation in a new population, we estimated the percentage of students accurately classified by using the leave-one-out technique and correctly classified 68% of the cases. These results indicate that hours of participation in a learning support center were related to likelihood of graduation. In other words, those students who participated consistently in the services of the Learning Resource Center were more likely to graduate from the college when compared to those who did not.

The second analysis procedure reflected frequencies of overall GPA for the five-year period studied. Within the total population, N = 262, 14% attended more than 90% of their scheduled sessions and 54% attended more than 50% of their appointments. The trend in the frequencies indicated that students with higher attendance had higher GPAs overall. Students who attended more than half of their scheduled appointments had the highest frequency of grades over 2.0; furthermore, this grouping had the majority of students with GPAs over 3.5. The majority of students who attended fewer than half of their scheduled appointments had grade point averages within the range of failing to 2.5. This group also reflected the largest concentration of students who earned less than a 1.5 GPA. Only 11.2% of students in this group had GPAs over a 3.0 (see Table 3).

Discussion

The purpose of this study was to investigate the connection between college success and learning support among college students with learning disabilities. The null hypothesis, academic support does not predict college success, was used to test the assumption that support programs designed to assist students with learning disabilities contribute to student success. Results indicated that students who consistently attended academic support center appointments had higher rates of success than those who did not attend or who did not attend consistently. Thus, the null hypothesis was rejected. These students tended to have higher grade point averages and persist to graduation.

For the purposes of this study, college success was defined by persis-

tence to graduation and higher cumulative grade point average (GPA). The results generated by this study demonstrate that the degree of learning support is a good predictor of graduation from college. A student's level of attendance at the Learning Resource Center was a predictor of graduation in 68% of the cases studied. Further, students who attended the Learning Resource Center most consistently had higher cumulative grade point averages than students who did not attend or who attended less consistently. Students who had failing grade point averages typically attended fewer than 50% of scheduled appointments.

Table 3
Attendance Rates of Students as a Function of GPA

	GPA						
Attendance	Below 1.0	1.1-1.5	1.6-2.0	2.1-2.5	2.6-3.0	3.1-3.5	3.6-4.0
0%							
n = 7	0.0	28.6	14.3	57.1	0	0	0
1-10%							
n = 6	50	33.3	16.7	0	0	0	0
11-20%							
n = 16	31.3	37.5	18.8	12.5	0	0	0
21-30%							
n = 25	44.0	20.0	12.0	12.0	4.0	4.0	4.0
33-40%							
n = 22	36.4	18.2	9.1	22.7	13.6	0	0
41-50%							
n = 31	32.3	16.1	19.4	16.1	12.9	3.2	0
51-60%							
n = 33	6.1	18.2	21.2	30.3	15.2	9.1	0
61-70%							
n = 30	16.7	10.0	26.7	33.3	10.0	3.3	0
71-80%							
n = 22	0	9.1	27.3	18.2	27.3	13.6	4.5
81-90%							
n = 31	0	3.1	12.5	50.0	18.8	9.4	6.3
91-99%							
n = 37	2.7	0	8.1	16.2	32.4	32.4	8.1
100%							
n = 2	50.0	0	0	0	0	0	50.0

Note. Data demonstrate the grade point averages categorized by attendance in LRC.

It is a logical assumption that academic support is connected to college success; however, participation in academic support programs is probably a complex calculus of assessment of need and skills by the student and of varieties of support by the institution. The preliminary findings described here form not conclusions but rather the basis for further investigation. It is believed that relationships created between learning specialists and students have as much to do with students' successes as the guidance and support they receive (Troiano, 2003). Further, students' college and pre-college life experiences with their learning disabilities result in a unique set of predispositions and reactions that impact the way each student perceives the definition, condition, orientation, and impact of the disability (Troiano, 2003).

For example, the current set of students enrolled in the Learning Resource Center worked closely with a learning specialist and a writing specialist several times each week. The literature on college student persistence has shown that students who are highly engaged and who have a strong connection to faculty, staff, and other students are more likely to persist to graduation than their peers who are not engaged and who do not feel connected with others (Pascerella & Terezzini, 2005; Tinto, 1994). The relationship between the student and the specialist is likely to be an essential element of support that leads to student success. A follow-up study designed to examine the link between engagement with students' perceived degree of support in the LRC is therefore warranted.

As in any study, the current study has limitations. The data here were collected as a regular function of the Learning Support Center and, in hindsight, additional critical data could have been collected. The data here could be improved upon using established measures to examine students' experiences in the Learning Resource Centers. Using measures to examine relationships with staff could have strengthened the understanding of the role of attending appointments at the Learning Resource Center. Future attendance data should also be analyzed for relationships between academic success and specific staff members. Finally, an investigation into the interactions between various forms of support accessed by the student would contribute to a better understanding of the overall college experience of students with learning disabilities.

References

Brinckerhoff, L. C. (1994). Developing effective self-advocacy skills in college-bound students with learning disabilities. *Intervention in School and Clinic, 29*, 229-237.

Estrada, L., Dupoux, E., & Wolman, C. (2006). The relationship between locus of control and personal-emotional adjustment and social adjustment to college life in students with and without learning disabilities. *College Student Journal, 40,* 43-54.

Field, S., Sarver, M. D., & Shaw, S. F. (2003). Self-determination: A key to success in postsecondary education for students with learning disabilities. *Remedial and Special Education, 24*, 339-349.

Foley, N. E. (2006). Preparing for college: Improving the odds for students with learning disabilities. *College Student Journal, 40*, 641-645.

Greenbaum, B., Graham, S., & Scales, W. (1995). Adults with learning disabilities: Educational and social experiences during college. *Exceptional Children*, 61, 460-471.

Henderson, C. (2001). *College freshmen with disabilities, 2001: A biennial statistical profile.* Retrieved from *http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/19/6c/2a.pdf.*

Horn, L., Berktold, J., & Bobbit, L. (1999). Students with disabilities in postsecondary education: A profile of preparation, participation, and outcomes. *Report of the National Center for Education Statistics.* Washington, DC: U.S. Department of Education.

Horn, L., Peter, K., Rooney, K., & Malizio, A. G. (2002). *Profile of undergraduates in U.S. postsecondary institutions:1999-2000.* Retrieved from *http://nces.ed.gov/pubs2002/2002168.pdf.*

Kowalsky, R., & Fresko, B. (2002). Peer tutoring for college students with disabilities. *Higher Education Research & Development, 21*, 259-271.

Kuo, J., Hagie, C., & Miller, M. T. (2004). Encouraging college student success: The instructional challenges, response strategies, and study skills of contemporary undergraduates. *Journal of Instructional Psychology, 31*, 60-67.

Mull, C., Sitlington, P. L., & Alper, S. (2001). Postsecondary education for students with learning disabilities: A synthesis of the literature. *Exceptional Children, 68*, 97-118.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college effects students, Volume 2, A third decade of research*. San Franciso, CA: Jossey Bass.

Satcher, J. (1992). College students with learning disabilities: Meeting the challenge. *College and University, 67,* 127-132.

Stage, F., & Milne, N. (1996). Invisible scholars: Students with learning disabilities. *Journal of Higher Education, 67,* 426-441.

Tinto,V. (1994). *Leaving college: Rethinking the causes and cures of student attrition.* Chicago: Univ. of Chicago Press.

Troiano, P. F. (1999). *Beyond the wall: A grounded theory exploration of college students with learning disabilities* (Doctoral dissertation). Available from Proquest Dissertations and Theses database. (UMI No. 9942992)

Troiano, P. F. (2003). College students and learning disability: Elements of self-style. *Journal of College Student Development*, *44*, 404-419.

Vogel, S. A., & Adelman, P. B. (1992). The success of college students with learning disabilities: Factors related to educational attainment. *Journal of Learning Disabilities, 25*, 430-441.

Vogel, S. A. (1993). The success of college students with learning disabilities: Factors related to educational attainment. *Learning Disabilities Research and Practice*, *8*, 35-43.

Wilczenski, F. L., & Gillespie-Silver, P. (1992). Challenging the norm: Academic performance of university students with learning disabilities. *Journal of College Student Development, 33*, 197-202.

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