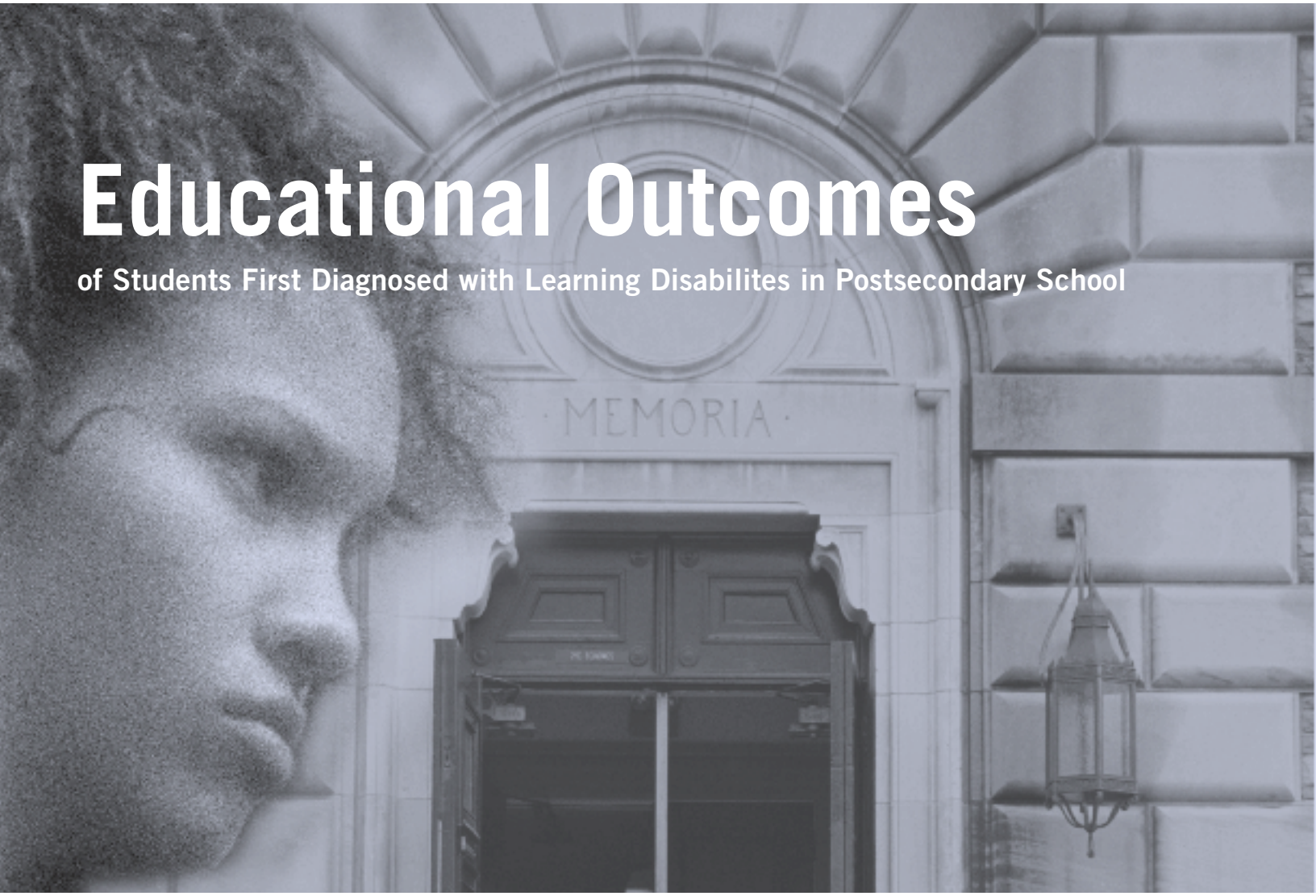

Educational Outcomes

of Students First Diagnosed with Learning Disabilites in Postsecondary School

By Angela I. Canto, Briley E. Proctor and Frances Prevatt

Abstract

The researchers examined the educational outcomes of three groups of college students who received an evaluation due to academic difficulties: those diagnosed with a learning disability (LD) who subsequently registered for services through the university student disability resource center; those diagnosed with an LD who did not register for services; and those who were evaluated, but did not receive a diagnosis. The purpose of the study was to determine if accommodations and services provided by the disability resource center had a positive academic impact on students with LD in regards to their GPA and re-enrollment status after two semesters post-evaluation. No differences in post-evaluation GPA were found between the groups. However, both LD groups demonstrated within-group improvements in their GPA following the date of their evaluation, whereas students without an LD showed no improvement. Finally, students who were not diagnosed with LD were more likely to drop out of school than either group of students with LD.

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Students with learning disabilities (LD) display many differences in college enrollment and graduation, as compared to youth without disabilities. Since the inception of the diagnosis in the 1960's, the number of students with LD enrolled in colleges and universities has risen dramatically. According to the National Center for Education Statistics (NCES, 2001), 36 percent of students identified as having a learning disability were enrolled in postsecondary institutions (academic and vocational). However, college-bound students with LD are frequently unprepared for the challenges presented by higher education (Skinner, 2004).

Murray and colleagues found that high school graduates with LD were significantly less likely than students without LD to attend postsecondary institutions and less likely to graduate from higher education within 10 years of high school graduation (Murray, Goldstein, Nourse, and Edgar, 2000). The decreased enrollment rate for students with LD often has a detrimental impact on later adult adjustment and employment. In fact, the Ohio Board of Regents reported in 2002 that earning a baccalaureate degree versus stopping with a high school diploma can increase one's lifetime earnings by up to 80 percent (2002, June).

Vogel (1986) argues that as LD difficulties persist through adulthood, eventual enrollment in postsecondary institutions may depend upon a combination of factors, including: type and severity of LD, intellectual potential, educational background, academic interventions, stamina, and motivation to learn. Other studies have identified additional factors contributing to eventual enrollment: greater self-understanding and self-advocacy skills, increased aspirations, preparation for the transition to postsecondary education, and an increased awareness of LD on the part of postsecondary settings (Gardner, 1999; Vogel, Leonard, Scales, Hayeslip, Hermansen, and Donnells, 1998).

Adult adjustment for students with LD has been a concern of researchers for more than two decades, although more research is still needed in this area. Sitlington and Frank (1990) examined the adjustment of students with LD as part of the Iowa Statewide Follow-Up Study, a five-year project following a random sample of special education dropouts and graduates. Adjustment variables explored included general adult status (e.g., leisure, marriage), employment, types of vocational training in high school, types of postsecondary education and training, and perceptions of selected aspects of high school experiences. Positive adult adjustment was characterized by students who were employed or otherwise meaningfully engaged (including attending school or obtaining vocational training), living independently (i.e., not living with parents), paying at least a portion of their living expenses, and involved in more than one leisure activity.

One year following high school graduation, 54 percent of the students with LD met the above criteria for positive adult adjustment. More than half of the high school graduates diagnosed with LD reported some postsecondary education or vocational training since high school. Fairweather and Shaver (1991) argue that schooling is crucial (although not sufficient) for preparing students with disabilities for adult social and economic independence. Unfortunately, the support many schools are giving to students to ensure employment is minimal. Many institutions and high schools do not provide transition planning and services from high school to college. Janipa and Costenbader (2002) state that effective transition services from high school to postsecondary education should include psychoeducation regarding the disability, individual strengths and weaknesses in learning, career decision-making skills, and preparation for the increased demands in the postsecondary environment.

Regarding the employment outlook for college graduates with LD, Dickinson and Verbeek (2002) indicated that college graduates with LD earn

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lower wages in the workplace than their colleagues without LD, primarily due to differences in productivity. According to Witte, Philips and Kakela, (1998), college graduates with LD (transfer students excluded) reported significantly less overall job satisfaction, and less satisfaction regarding pay and promotion opportunities than non-LD college graduates. They did not find any significant salary discrepancies between the two groups; however, the graduates with LD perceived a pay inequity, which the authors surmise can ultimately affect job satisfaction, work production, stability, and long-term career investment. They also noted that most of the college graduates with LD did not disclose their LD to their employers and only five percent requested a "special needs status" or requested accommodations from their employers. Lastly, they found that the sample of non-LD college graduates had higher GPA than graduates with LD (3.07 versus 2.72), and that non-LD college graduates required less time to finish their degree than their counterparts with LD (4.1 years versus 4.6 years).

Students with LD are eligible to receive accommodations and services at all public postsecondary institutions. Section 504 of the Rehabilitation Act of 1973 mandates that students with disabilities have an equal opportunity for education in postsecondary schools. However, this mandate does not define or delineate "equal opportunity." Thus, the type and extent of services offered to provide students with disabilities an "equal opportunity" vary dramatically across institutions. According to one study, academic, social, and career counseling was available at all schools participating in a survey of services available to students with disabilities (Woods, Sedlacek and Boyer, 1990). Other common support services available at greater than 75 percent of institutions responding included: tutoring, test administration service, faculty consultation, reader service and priority registration. Common accommodations included extended testing time and testing in an alternative format.

It appears that a relatively small percentage of college students with LDs actually take advantage of student support services available to them (Mellard and Byrne, 1993). Hartmann-Hall and Haaga (2002) studied 86 students diagnosed with LD to determine factors related to their willingness to seek help. Results suggested that perceptions of past experiences with help-seeking from a professor likely influence the student's current decision to seek help. Second, students who held a negative view of their own LD were less likely to seek help. It was also speculated that students who perceived their academic competence to be poor were more likely to seek help. Students who perceived that help would improve performance goals (e.g., grades) were more likely to seek help. This research is important in that persuading students to seek help is essential for interventions to be successful.

To date, very few studies have collected academic performance data (e.g., GPA) of students with LD who receive support services and accommodations in college (Vogel and Adelman, 1992). Woods et al. (1990) argue that institutions should be keeping data on the graduation rates of their students with LD as a measure of service effectiveness; although colleges and universities are expending a great deal of time and money assessing and servicing students with LD, very few have evaluated the effectiveness of their practice. Given the relationship between postsecondary education and a student's later adult adjustment, it is imperative that university personnel

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are able to identify and assist students with LD. It is equally important to determine whether students with LD perform differently from students without an LD, whether students with LD take advantage of special services, and whether these services have a positive effect on academic progress.

The purpose of this study was to examine the educational outcome of three groups of students who received a psychoeducational evaluation due to academic difficulties. The first group was comprised of students with academic difficulties who were evaluated, but did not receive a diagnosis of LD, and thus would not be eligible for services through the university's disability resource center. The second group consisted of students who did receive the diagnosis of LD and subsequently registered at the center. The third group also received a diagnosis of LD, but did not register with the disability resource center. Researchers hypothesized that the LD group who did register for services would have higher GPAs at the conclusion of the study, and would be less likely to have dropped out of school, than either the group without the LD, or the group with LD who did not register for services. Thus, one year following the evaluation, the outcome variables of GPA and re-enrollment status were compared for the three groups. In addition, all groups were evaluated for within-group changes in GPA to assess "degree of improvement" following the evaluation. This study only evaluated students who were newly diagnosed with LD or were seeking accommodations for the first time. Clearly, many students come to college having already received disability services in high school and continue receiving those services in college. This latter population of students was not evaluated in this study.

Method

Participants

Participants in this study were 228 students enrolled at a large public southeastern university, who were referred to a university-based clinic for a psychoeducational evaluation during 1999–2000. Referrals came from five primary sources: self referrals, the on-campus Student Counseling Center, academic advisors, professors, or the on-campus Student Disability Resource Center. The most common reason for a referral was that a student was failing one or more classes, or the student had failed the university competency test (covering math, English, writing, and science) required for graduation. The students were evaluated to determine if a learning disability might explain their academic difficulties in college classes. The cost of the evaluation was $400. The participants were classified into three groups—those who were diagnosed as LD as a result of the evaluation and subsequently registered for services (LD-REG group), those who were also diagnosed but chose not to register for services (LD-UNREG group), and those who did not meet the diagnostic criteria for LD (NON-LD group). The LD-REG group consisted of

72 students (32 percent), the LD-UNREG of 96 students (42 percent), and the NON-LD group consisted of 60 students (26 percent).

The criteria used to diagnose LD were those set forth by the Association on Higher Education and Disability (AHEAD, 2000). The clinic conducts a pre-screening of all applicants to determine the presence of academic difficulty in specific content areas, accompanied by an overall ability to successfully complete college-level coursework. This pre-screening involves an oral interview and an evaluation of the student's transcripts to determine whether difficulties in math, reading or foreign language might be present, and whether there appears to be a pattern to the student's grades. All students receive the identical standard battery. However, if failures in math are evident, these students will complete an additional achievement measure in math not completed by students with A or B grades in math (although all students complete basic math achievement tests). A general measure of intelligence, the Wechsler Adult Intelligence Scale, Third Edition (WAIS-III; Wechsler, 1997), is administered to determine the student's overall level of intellectual ability. The Woodcock-Johnson III, Tests of Achievement and Tests of Cognitive Abilities (WJ III ACH and WJ III COG; Woodcock, McGrew, and Mather, 2001a and 2001b) are also administered to evaluate academic achievement and cognitive processing abilities, respectively. In accordance with the diagnostic model prescribed for K-12 students in the university's state, the clinic uses a simple discrepancy model to diagnose LD; the student must demonstrate an intellectual ability/ achievement discrepancy of at least 15 points (1 SD on the measures used), co-occurring with an intellectual ability/ cognitive processing deficit of at least 15 points. Additionally, the student must have an overall IQ of at least 80 (ninth percentile).

All evaluations are completed by graduate students in an Ed.S. or doctoral program in School Psychology. All students have completed a minimum of 10 hours of coursework in assessment, have completed an extensive training program at the clinic and are enrolled in a two-semester practicum in the public schools. For accuracy of scoring, independent scorer s check all protocols. Next, a Ph.D.-level psychologist supervises each completed evaluation report. Finally, a second Ph.D.-level psychologist rechecks the evaluation and reconfirms the diagnosis. If any disagreements occur, a third rater (also a Ph.D.-level psychologist) is consulted. Therefore, agreement is reached on 100 percent of evaluations.

Descriptive statistics of the three groups and the university in aggregate are presented in Table 1 and include age, SAT Total score, ACT Composite score, pre-evaluation GPA, post-evaluation GPA, and re-enrollment status. The LD-REG sample was comprised of 36 percent males, the LD-NONREG group 35 percent males, and the NON-LD group 52 percent males. Ethnicity of the sample was unknown. At the time this study was conducted, the center registration procedures did not require students to give their ethnicity. The university only had aggregate data on ethnicity. Individual student files did not contain this information.

Procedure

All students evaluated for LD at the university-based assessment clinic from January 1999 to December 2000 were initially eligible for participation in this study (330 students total). Only those students who had signed a consent form allowing the clinic to use the evaluation data for research were pulled for review in the study. These archival files were then examined to determine if the student had outcome data in the university's database for two semesters following the evaluation. Therefore, students attending nearby institutions who were evaluated at this clinic were not included in the study, as their outcome data would not be available. A total of 228 participants met these criteria and comprised the final sample.

Files were coded for the following variables: diagnosis of LD (yes/no), type of LD (if diagnosed), age, gender, SAT scores, ACT scores, and cumulative GPA at the time of evaluation. The students' academic records were then accessed from the university database to retrieve post-evaluation (or outcome) GPA that represented the cumulative GPA for only the two semesters following the evaluation. For those students diagnosed with LD, data regarding the students' subsequent registration with the university's disability center were obtained in order to separate the students with LD into the two groups (LD-REG and LD-UNREG). Finally, enrollment status two semesters following the evaluation was coded for each participant. The two outcomes considered were that (a) the student was re-enrolled in the university or had graduated, or (b) the student had not re-enrolled in college, and thus had presumably dropped out of school or had transferred.

Results

Initially, the three groups were compared to the university aggregate data for age, cumulative GPA, SAT Total and ACT Composite score in order to gain an understanding of the factors that may have contributed to the initial referral for an evaluation. A series of one-sample t-tests compared the means of the three referred groups to the university mean for each of the aforementioned variables. These data are in Table 2. No age differences were found. However, the mean of each of the three groups was significantly lower than that of the university aggregate on all of the indicators of academic ability: GPA, Total SAT score and ACT Composite.

Next, between-group differences were analyzed for outcome GPA (the cumulative GPA for the two semesters following the evaluation, excluding summer semester). The three referred groups were first compared on pre-GPA (cumulative GPA at the time of the evaluation) to establish whether it would be necessary to control for pre-GPA differences in the analysis of outcome GPA. It was found that the NON-LD group had lower pre-GPA than the LD-REG group. Thus, because of these group differences in pre-GPA, a gain score analysis was used for comparing outcome GPA. According to Weinfurt (1995), gain score analysis (versus ANCOVA) is the proper analysis when comparing pretest-posttest data for quasi-experimental (i.e., intact) groups that do differ on the mean pretest score. A one-way ANOVA using gain scores in GPA as the dependent variable indicated no differences between the groups, $F(2,204)=.97$, $p=.38$.

Although no group differences on post-evaluation GPA were found, it was also of interest to see if any group showed significant gains on GPA from pre- to post-evaluation. Thus, a series of dependent-samples t- tests were conducted to evaluate within-group changes on GPA. The NON-LD group

showed no changes in GPA [t(62)=-1.61, p=11]. However, both groups with LD showed improvements in their cumulative GPA two semesters following the evaluation [LD-REG, t(88)=-4.5, p<.001, Cohen's d=.51; LD-NONREG, t(54)=-2.57, p=.01, Cohen's d=.34].

Finally, students' enrollment status two semesters following the evaluation was compared for the three groups using a Chi-square analysis. There was no difference in enrollment status between any of the groups; however, the Chi-square statistic approached significance in the NON-LD/LD-REG comparison, indicating that the NON-LD group had more students who had dropped out or transferred than did the group of students with LD who had registered for services [$\square^2$ (1, 167)=3.63, p=.06].

Given that only 62 percent (n=96) of the students eligible for services actually registered with the disability resource center, the researchers decided post-hoc to determine what, if any, variables contributed to the prediction of those students who would register at the student disability center after being diagnosed with LD. The following demographic variables were included in a binary logistic regression analysis: age, gender and pre-evaluation GPA. None of these variables contributed significantly in predicting whether a student subsequently registered with the on-campus disability resource center.

Discussion

Many students are first evaluated for the presence of LD while in college. These students oftentimes meet the minimum requirements to enter college, but may have required tutoring and other types of assistance to help them complete their high school courses. Furthermore, while in high school, these students often have the support of parents and engaged teachers to help them structure their academics and studies to enhance their strengths and support their weaknesses. However, as students enter college, the environment changes dramatically (Evelo and Price, 1991). Parents and teachers are no longer available to support the students on a daily basis. Additionally, these students are likely encountering freedom and responsibility beyond what they have experienced in the home environment. Difficulties in transition are one of the predictors of postsecondary school attendance (Halpern, Yovanoff, Doren, and Benz, 1995). Many youth in high school appear not to be well prepared for the transition to college (Murray et al., 2000). It is of interest to know whether academic services and accommodations provided to college students with LD make a difference in subsequent academic performance.

The college students comprising this sample were all experiencing academic difficulties, and all were evaluated for a possible learning disability. Prior to their evaluation, mean scores for college entrance exams and college GPA were significantly lower than the scores for the university student body at large, indicating that all of these students demonstrated academic deficits in comparison to their non-referred university counterparts. Two semesters post-evaluation, a follow-up was conducted of the students. The results of this study indicate that those students who were diagnosed with LD demonstrated a significant improvement in their mean GPA two semesters following the evaluation, regardless of whether they had actually registered for services through the disability resource center. In contrast, those who were evaluated but did not receive the LD diagnosis showed no significant change. Although just short of being statistically significant, the researchers also found that students who were not diagnosed with LD were more likely to drop out of school or transfer than those who had an LD and had registered for services.

Many possible conclusions can be drawn from these findings. Students who received a diagnosis of LD evidenced an increase in their GPA two semesters after the diagnosis, regardless of whether they registered for services. One conclusion is that the services are ineffective, as there is no effect size for registering on academic achievement; however, it is unknown what self-changes were made by the students who did not register. Many of the recommendations provided to students on their psycho-educational reports could be implemented without formally registering at the center, including suggestions for load-balancing, study skills classes, test-taking strategies, opportunities for free tutoring, career counseling, and counseling for anxiety and other emotional difficulties. However, these same services are also available and recommended to students who did not receive an LD diagnosis, a group that did not demonstrate similar improvements in GPA. Therefore, it seems that in this study, it was the act of receiving the diagnosis that differentiated between those who did and did not show subsequent improvement in academic performance. One area of additional research would be to examine how receiving a diagnosis of LD in college affects students' subsequent motivation to make changes in their study habits, seek additional help and follow other types of recommendations. Motivation has consistently been shown to be a primary determinant of learning (Ley and Young, 1998). Thus, perhaps the students who receive the diagnosis see the diagnosis as an explanation for why they have struggled so earnestly in the college courses, and feel a sense of "relief" that someone has suggested that their difficulties are not their fault, that they are not stupid, and that they can achieve in school if they follow the recommendations offered to them. Regardless, it is clear that this sample of students who are struggling academically and then diagnosed with a learning disability are not falling further behind, are making slight yet statistically significant gains in their grade point average, are staying in school, and are making progress toward graduation. On the other hand, students who do not receive a diagnosis following the evaluation may actually be de-motivated. They have not been offered an explanation for why they are struggling with their academic coursework, they are not provided protection under Section 504, and they may be leaving the evaluation with a sense of hopelessness that negatively impacts the probability that they will follow through on the recommendations provided to them. In other words, they give up.

Limitations of the study include the following. First, the present study used participants from a single four-year university. Replication of this study in other university and college settings is appropriate to determine the generalness of the current findings. Secondly, the researchers in this study did not subgroup the samples according to academic majors or class standings due to the relatively small sample size. Thus, the researchers were not able to control for the differences in level of difficulty of the student's academic programs. It should also be noted that two semesters of outcome data were not available for every participant due to some students graduating or not re-enrolling. Therefore, the final GPA was sometimes based on one, rather than two, semesters. Also, the participants were grouped based upon two crite-

ria—whether they received the LD diagnosis, and whether they registered for services (if eligible). Thus, other influences related to the outcome variables may have been excluded (e.g., financial support, mental health, comorbidity, severity of LD, IQ).

An additional limitation of this study pertains to the criteria used for diagnosing participants. It is recognized that the diagnostic criteria may not match criteria used in other postsecondary settings, leading to inconsistencies in the independent variable (i.e., diagnosis) across studies. This is due to the ongoing debate regarding the best methods of diagnosing LD. Section 504 of the Rehabilitation Act of 1973, the Individuals with Disabilities Act of 1990, and state laws have done little to contribute to a unified concept of LD (Vogel 1982; Witte, Philips, and Kakela, 1998). As several authors have noted (see Witte et al., 1998 for a brief review), the definition of LD varies according to age, school, district, diagnostic cutoffs, and severity. The diagnostic criteria for LD are even more inconclusive at the postsecondary level. Universities and community colleges struggle to identify and accommodate students with an LD (Blackburn and Iovacchini, 1982; Gregg and Hoy, 1990; Vogel, 1986). Most recently, Proctor and Prevatt (2003) found that the various models used to diagnose LD have very low correlations, suggesting that whether a student receives a diagnosis of LD or not is highly dependent upon the diagnostic model selected by the clinician. Thus, the results of the study may not be generalizable to other samples utilizing different models of diagnosing LD. Finally, it is important to clarify that the students included in this study were only those who had requested an evaluation for possible LD. Therefore, the majority of these students were learning of their diagnosis for the first time. Clearly, there were many students who came to college with a diagnosis of LD, and many of these students had been, and continued to, receive services. Therefore, the results of this study cannot be generalized to all college students who have LD.

Future research in this area includes replicating this study with a larger sample (preferably across several universities and colleges) and sub-grouping the sample into majors and class standings. Also, this study focused on determining outcomes of students who were evaluated once in college, but it would also be of interest to determine outcomes of students who are admitted to the university under special consideration due to a prior LD diagnosis. In terms of those services and recommendations included in the psychoeducational evaluation, it may also be of interest to determine student satisfaction with, and effectiveness of, those services and recommendations.

REFERENCES

Association on Higher Education and Disability (2000, March 18). *Guidelines for Documentation of a Learning Disability in Adolescents and Adults*. Retrieved August 21, 2000, from http://www.ahead.org/ldguide.html

Blackburn, J. C., and Iovacchini, E. V. (1982). Student service responsibilities of institutions to learning disabled students. *College and University*, 57, 208-217.

Dickinson, D. L., and Verbeek, R. L. (2002). Wages differentials between college graduates with and without learning disabilities. *Journal of Learning Disabilities*, 35, 175-184.

Evelo, S., and Price, L., (1991). The transition of students with learning disabilities: A case study. *Journal of Postsecondary Education and Disability,* 9, 1-9.

Fairweather, J. S., and Shaver, D. M. (1991). Making the transition to postsecondary education and training. *Exceptional Children*, 57, 264-270.

Gardner, D. (1999). R*ecent study focuses on preparation and outcomes of students with disabilities.* Washington, D.C.: HEATH Resource Center.

Gregg, N. and Hoy, C. (1990). Identifying the Learning Disabled. *The Journal of College Admissions*, Fall, (129) 30-33.

Halpern, A. S., Yovanoff, P. Doren, B., and Benz, M. R. (1995). Predicting participation in post-secondary education for school leavers with disabilities. *Exceptional Children*, 62, 151-164.

Hartman-Hall, H. M., and Haaga, D. A. F. (2002). College students' willingness to seek help for their learning disabilities. *Learning Disabilities Quarterly*, 25, 263-273.

Janipa, S. J., and Costenbader, V. (2002). The transition from high school to postsecondary education for students with learning disabilities: A survey of college service coordinators. *Journal of Learning Disabilities*, 35, 462-468.

Ley, K.L., and Young, D.B. (1998). Motivation in developmental and regular admission college students. *Research and Teaching in Developmental Education,* 14, 29-38.

Mellard, D. F., and Byrne, M. (1993). Learning disability referrals, eligibility outcomes, and services in community colleges: A four-year summary. *Learning Disabilities Quarterly,* 16, 199-218.

Murray, C., Goldstein, D. E., Nourse, S. and Edgar, E. (2000). The postsecondary school attendance and completion rates of high school graduates with learning disabilities. *Learning Disabilities Research and Practice,* 15, 119-127.

National Center for Educational Statistics (2001). *Digest of education statistics*, 2001: NCES Fast Facts: Students with Disabilities. Available: http://www.nces.ed.gov/programs/digest/d01/dt111.asp

Ohio Board of Regents. (2002, June). *The Issue*. Columbus, Ohio: Author.

Proctor, B. and Prevatt, F. (2003). Agreement among four models used for diagnosing learning disabilities. J*ournal of Learning Disabilities*, 36, 459-466.

Sitlington, P. L., and Frank, A. R. (1990). Are adolescents with learning disabilities successfully crossing the bridge into adult life? *Learning Disability Quarterly*, 13, 97-111.

Skinner, M. E. (2004). College students with Learning Disabilities speak out: What it takes to be successful in postsecondary education. *Journal of Postsecondary Education and Disability*, 17, 91-104.

Vogel, S. A. (1982). On developing LD college programs. *Journal of Learning Disabilities*, 15, 518-528.

Vogel, S. A. (1986). Levels and patterns of intellectual functioning among LD college students: Clinical and educational implications. *Journal of Learning Disabilities*, 19, 71-79.

Vogel, S. A., and 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., Leonard, F., Scales, W., Hayeslip, P., Hermansen, J., and Donnells, L. (1998). The national learning disabilities postsecondary data band: An overview. *Journal of Learning Disabilities*, 31, 234-247.

Wechsler, D. (1997). Wechsler Adult Intelligence Scale—Third Edition. San Antonio: The Psychological Corporation.

Weinfurt, K. P. (1995). Multivariate Analysis of Variance. In L. G. Grimm and P. R. Yarnold (Eds.), Reading and understanding multivariate statistics (pp. 245-276). Washington, DC: American Psychological Association.

Witte, R. H., Philips, L., and Kakela, M. (1998). Job satisfaction of college graduates with learning disabilities. *Journal of Learning Disabilities*, 31, 259-265.

Woodcock, R. W., McGrew, K. S., and Mather, N. (2001a). *Woodcock-Johnson III, Tests of Achievement*. Itasca, IL: Riverside Publishing.

Woodcock, R. W., McGrew, K. S., and Mather, N. (2001b). *Woodcock-Johnson III, Tests of Cognitive Abilities*. Itasca, IL: Riverside Publishing.

Woods, P. A., Sedlacek, W. E., and Boyer, S. P. (1990). Learning disability programs in large universities. *NASPA Journal*, 27, 248-256.