University Students with Disabilities: Factors that Contribute to Their Self-Predicted Likelihood of Graduation

Julia Schechter[1]

Abstract

The purpose of this article is to explore what college planning practices or demographic characteristics are associated with confidence in degree completion for college students with disabilities. A survey was used to gather retrospective data from undergraduate students with disabilities registered with a disability services office at a large doctoral-granting public four-year university (n = 260). A series of t-tests were conducted to test for significant differences in students' confidence of graduation by demographic factors and practices while in high school. Certainty in graduation was measured by students' self-reported likelihood of graduation on a five-point Likert-type scale. Results demonstrate that students at that university, who predict a high likelihood of graduation, report certain individual characteristics, attitudes, practices and activities as important to their eventual degree attainment compared to students not in those groups. These include talking with a college representative while in high school, registering with the disability service office during the first year of college, receiving special education services in high school and students who are deaf or hard of hearing self-report a higher likelihood of graduation. Students who were beneficiaries of the free and reduced lunch program in high school had a lower self-prediction of college graduation than non-free and reduced lunch program students.

Keywords: Degree completion, disabilities, high school experience, postsecondary education

In the four decades since passage of the Individuals with Disabilities Education Act (IDEA) and codification of the transition process with the renewal of IDEA in 1997 and 2004, there remains a need for research to understand how to better prepare students with disabilities to complete postsecondary education (Newman, Madaus & Javitz, 2016). Overall, students with disabilities are attending college in growing numbers, but they remain behind their peers in earning baccalaureate degrees and their enrollment varies widely by disability category from 30 to 75 percent, with learning disabilities most commonly represented. (Newman et al., 2011). According to the U.S. Department of Labor, in 2014, 16.4 percent of people 25 and older with a disability had completed at least a bachelor's degree compared to 34.6 percent of those with no disability (Bureau of Labor Statistics, 2015). This statistic is based on the BLS Current Population Survey (CPS), a monthly sample survey of 60,000 U.S. households that uses a series of six questions to identify the people with disabilities. Policy-makers and educators have focused on improving transitions after high school with less attention paid to investigating best strategies at the secondary level that will lead to postsecondary degree completion. Research concentrating on how better equip high school students with disabilities for college graduation is important since postsecondary education has been linked to improved employment opportunities (Newman et al., 2011; Pepnet 2, 2017).

Literature Review

While there is significant research about the educational status of students with disabilities, less is known about students who persist to graduation or drop out (Fichten et al., 2014). Astin's model (1977, 1993) of student involvement recognized that students arrive in college with a set of demographic characteristics and previous experiences that form "inputs" such as disability, income and gender status that impact their engagement. In their study of students enrolled at a large mid-western university, Wessel, Jones, Markle & Westfall (2009) found that female students, and those that were better academically in high school (as measured by SAT scores)

[1] *Seattle University*

more prominently influenced years taken to graduate than disability type. Correlational research to determine predictors of post secondary success for students with disabilities conducted by the National Secondary Transition Technical Assistance Center (NSTTAC), identified 16 evidence-based indicators of employment, education and independent living (Test & Cease-Cook, 2012). Since only two of the 16 areas (teaching life skills and purchasing skills) presented a strong level of evidence, and those pertaining to postsecondary education were considered too generic to impact secondary school practice (Shaw & Dukes, 2013), NSTTAC called for more research, disaggregated by disability type and around the areas of Family Involvement, Program Structure and Interagency Collaboration (Test & Cease-Cook, 2012).

Bolt, Decker, Lloyd and Morlock (2011) reported that early success requesting accommodations in high school by students with reading and writing related disabilities might add to their confidence level in seeking similar supports in college. Other research such as the archival review of 1,289 inactive student files at three Midwestern public universities, conducted by O'Neil, Markward, & French (2012), found that students who received university based accommodations such as distraction-reduced testing, alternative format tests and flexibility in assignment and test dates were significant predictors of graduation. In their study of students at a large competitive state university, Lightner, Kipps-Vaughn, Schulte, and Trice (2012) posited that students delayed seeking services for four reasons: (a) lack of time, (b) lack of knowledge, (c) desire to establish a disability-free identity and (d) a general feeling that things were going well. Students with learning disabilities may not seek accommodations they need to succeed in college because they want to deny their learning problems and distance themselves from the special education label they carried in K-12 (Field, 1996). Mamiseishvili and Koch (2011) used national data from the Beginning Postsecondary Longitudinal Study to understand what factors impede or facilitate first-to-second-year college persistence of students with disabilities and found that access to accommodation, involvement on campus, full-time attendance, on campus-living, degree aspirations, GPA and net price of attendance are significant predictors. The impetus for their study was in part based on earlier research (Horn & Carroll, 1998), which demonstrated that students who persist beyond their first year are more likely to graduate. Based on a meta-review of literature, Garrison-Wade and Lehmann (2009) created a framework to summarize research about effective secondary school interventions for youth with disabilities that emphasized ongoing communication across institutions, goal-setting for the high school student and goal statement for his or her college experience.

Theoretical Framework

Kohler's Taxonomy for Transition Programming (1993, 1996) has been foundational to research on effective classroom or school-based practices that can be used to foster student success after high school and is widely recognized as a framework for comprehensive secondary school transition education and services (Dukes, Madaus, Fagella-Luby, Lombardi, & Gelbar, 2017; Test, Fowler, White, Richter, & Walker 2009,). The Taxonomy defined five domains that included specific interventions and skills that a student should acquire throughout K-12 that are essential for transition from high school: Student-Focused Planning, Student Development, Interagency Collaboration, Family Involvement and Program Structure. This review is limited to the three components of the Taxonomy most aligned with this study's research question of what college planning practices or demographic characteristics make a difference to college students' with disabilities self-reported likelihood of college graduation: Student-Focused Planning, Interagency Collaboration and Family Involvement.

Student-focused planning. Student-Focused Planning is an approach to transition programming activities and practices that supports students to develop self-determination and awareness skills necessary to make educational decisions based on their own objectives (Kohler, 1993). An example is incorporating students' postsecondary goals into the Individualized Education Program (IEP) and including the student in decision-making and evaluation of progress toward meeting those goals (Field & Hoffman, 2007; Martin & Williams-Diehm, 2013). Actively engaging students in the IEP process helps them develop knowledge of their disability, awareness of postsecondary support services available, and the ability to self-advocate (Cawthon & Cole, 2010; Milsom & Hartley, 2005). Prior research demonstrates that understanding and being able to explain the nature of one's disability and what strategies and supports best enable learning is imperative as students bear the responsibility to advocate for their specific needs in higher education (Shaw, Madaus, & Banerjee, 2009). Research has shown that self-advocacy and self-determination skills are linked to improved postsecondary education outcomes (Field, Sarver & Shaw, 2003; Janiga & Costenbader, 2002; Martin, Portley & Graham, 2010; Morningstar et al., 2010; Wehmeyer, 2015).

Interagency collaboration. Interagency Collaboration is a requirement of the IEP process since

IDEA of 2004 mandated that every eligible student must have appropriate measurable postsecondary goals, a connection to an agency to assist in reaching those goals, and transition services outside of the local education agency [34 CFR 300.321(b)(1)] and (3)] [20 U.S.C. 1414(d)(1)]. These linkages are critical to successfully bridging the gap to success beyond high school (Kohler & Field, 2003), yet because of differing laws and expectations governing K-12 and higher education, creating institutional exchanges continues to be a challenge (Shaw & Dukes, 2013). Although the legal context for the IEP and 504 plan differ, both are vehicles for ensuring equal access to education for students with disabilities and both can serve to connect students with postsecondary education institutions and other organizations to help the transition from high school. For example, as part of the IEP process, the Summary of Performance (SOP) document is intended to include student's postsecondary goals and should include accommodations that would be allowed under Section 504 and the ADA in postsecondary education (Shaw, 2010). By creating the SOP at the end of their high school years, students are able to practice self-determination, develop an awareness of their disability, strengths and needs as well as include family in the process of establishing linkages to higher education institutions (Shaw, 2009).

Postsecondary institutions, unlike schools, are not required by law to create linkages to other education institutions for the purpose of facilitating the transition of special needs students. Instead, institutions wait for students to self-identify by requesting accommodations or services at the campus disability service office. The initial interface between the institution and student comes by way of verifying their disability. For purposes of granting accommodations, postsecondary institutions surveyed by the U.S. Department of Education (Raue & Lewis, 2011) reported the most common forms of documentation accepted: the IEP (44%), the 504 plan (40%) and comprehensive vocational rehabilitation agency evaluation (80%). Visiting a college campus to gain information from the disability service office and to select an environment that best meets a student's interests and needs is an example of an agency connection (U.S. Department of Education Office of Civil Rights, 2011). Institutional exchanges can take place without leaving the high school such as when college representatives visit high school campuses. For example, a pilot study of 43 high school seniors suggested that a mentoring intervention was associated with a substantial and significant decrease in negative attitudes toward requesting accommodations (Barnard-Brak, Schmidt, Wei, Hodges & Robinson, 2013).

Family involvement. Family Involvement is a cornerstone of policy and legislation related to transition programming for students with disabilities in schools. The IDEA of 2004 mandates parent involvement specifying that public agencies ensure that one or both parents have the opportunity to participate in IEP meetings (§300.322). Inclusion of parents or guardians in transition programming is based on research that demonstrates family involvement is critical in fostering educational growth in children (Newman, 2005). For example, one retrospective study of 19 college students who had IEPs in high school reported that they learned about their rights as a college student and how to advocate for their needs in a postsecondary setting from their families, not special education teachers or high-school counselors (Anctil, Ishikawa & Scott, 2008). While families have a legally mandated role to support their child in high school, this status changes when the student enters an institution of higher education. Once in college, where it is incumbent on the student to establish their own supports, the discontinuation of family participation may partially explain why many students with disabilities do not seek accommodations in higher education, i.e., almost two-thirds of postsecondary students who were identified by their secondary school as having a disability did not consider themselves to have a disability by the time they had transitioned to a postsecondary institution (Newman et al., 2011). While laws are in place to provide support to students with disabilities at postsecondary institutions, these resources are underutilized because students are often unaware of their rights and responsibilities regarding how to gain accommodations (U.S. Government Accountability Office, 2009). Thus, family training and awareness around these differences can be critical in preparing students to take advantage of these supports.

This retrospective study that surveyed undergraduates' perceptions of their high school experience, is significant because it focused on investigating secondary school transition practices that support degree completion. Specifically, this study tied high school students' activities and characteristics to their own self-prediction of eventual college graduation. Research about what factors contribute to postsecondary degree attainment of students with disabilities is limited (Dukes et al., 2017), in part because federal policy regulates preparation of high school students for graduation and transition to independent living, but does not monitor degree completion. Specifically, states are required under IDEA to report the (a) percent of youth aged 16 and above with an IEP that includes coordinated, measurable, annual IEP goals and transition services that will reasonably enable the

child to meet the postsecondary goals [20 U. S. C. 1416 (a)(3)(B)], and (b) the immediate post-school outcomes of young adults who had an IEP one year after leaving high school (20 U.S.C. 1416(a)(3)(B)). Investigating the high school practices and attributes of students who were registered at their university disability services office, may provide strategies for postsecondary institutions to be better prepared to educate this growing population of students. Thus, this study explores the question of what college planning practices or demographic characteristics are associated with university students' with disabilities self-reported likelihood of college graduation.

Method

Participants

Participants were undergraduate students with disabilities enrolled at a public doctoral-degree granting university located in the Pacific Northwest. For purposes of the survey, a student with a disability was defined as a student registered to receive services at the university's disability student services office (DSO). The sample was limited to the 1,275 undergraduate students registered with the university DSO during the academic quarter when the study was administered in 2016. A total of 286 students responded; 26 responses were omitted due to incomplete or missing data. The overall response rate was calculated based on 260 responses (20%).

Design

This study was conducted while this researcher was a doctoral research assistant at the Center for Change in Transition Services. The CCTS is federally mandated under Indicator 14, 20 U.S.C. § 1416(a)(3)(B) of IDEA, to collect and analyze state level data collected about special needs students after they leave high school. The web-based survey used in this study was created by this author and guided and reviewed multiple times by researchers at the Center as well as piloted at a private four-year university. Three components from Kohler's Taxonomy (1996): Student-Focused Planning, Interagency Collaboration and Family Involvement, were used to inform the development of the 33-item survey. The survey was designed to gather information about each of the three domain areas (See Figure 1) but was not structured according to these categories. To limit the study, two Taxonomy areas that focus more on the school environment or work force preparation were omitted. These were (a) Program Structure, which are features of the K-12 environment that relate to the planning and delivery of transition services and (b) Student Development, which emphasizes life, employment and occupational skill development through school- and work-based learning experiences (Kohler & Field, 2003). In addition, *Objectives to Use for Postsecondary Education Goals*, a list of transition programming practices and goals established by the Connecticut State Department of Education (2007), helped shape the development of the questionnaire. The survey instructed students to reflect on their high school years to assess how their different attributes, experiences and activities impacted their self-predicted likelihood of college graduation.

The survey included five sections: (a) Demographic Information, (b) Student Status, (c) Student Experience in High School with Special Education Services, (d) Student Experience in High School Planning for College, (e) Three survey items at the end of the questionnaire provided respondents with open-ended text boxes to record their perceptions about which aspect of their high school experience best prepared them for college graduation. Questions were formatted as categorical ("yes-no"), or continuous Likert-type scaled (e.g., Never to Always), when rating their level of self-advocacy or ability to explain their disability. Toward the end of the survey, respondents were asked to gauge their likelihood of graduating from college using a 5-point Likert-type scale (from 1- Very likely to 5-Very unlikely). Asking students to estimate their chances of completing a degree has been used with accuracy by Astin (1977, 1993) in his survey of student attitudes. The graduation prediction item was asked toward the end of the survey to make the response more meaningful. According to Patton (2002), opinions and feelings are more likely to be grounded once the respondent has relived the experience through preceding survey items. In addition, survey items about the past tend to be more difficult for respondents than questions about the future, so these were placed first. Because the study participants were enrolled at a selective (grade point average [GPA] in high 3.0 range) university, an assumption was made that respondents had attained a high standard of academic achievement. As such, this study did not request students' high school GPA or other measures of high school academic achievement.

Procedures

The survey was first piloted at a private university with an undergraduate enrollment of about 4,500. The content of the questionnaire was reviewed by the disability services directors where both the pilot and final survey were administered as well as researchers at the CCTS. To administer the pilot, a staff person in the DSO sent an email to 53 undergraduate stu-

dents (18 students were members of the Coalition for Students with Disabilities and the others were randomly selected from the DSO database of registered students). A gift card incentive was offered. In total, there were 10 responses (19% response rate) and eight of the surveys submitted contained complete responses, which indicated that instructions were understood. At the end of the pilot survey, a text box was provided for students to answer whether they had any concerns, suggestions, or comments about the format, construction, or content of the survey (Gall, Gall, & Borg, 2007). Responses (e.g., adjust skip logic questions, add "other" to the gender category, modify duplicate questions) were used to shape the final questionnaire. The final survey was administered after the pilot testing, and when the project was granted exemption from the need for Institutional Review Board approval (based on compliance with 45CFR46.101(b) confidentiality requirements). Undergraduate students at the large public university were invited (in an email) to participate in the final study by the director of the university's disabilities services office during a two-week period that included spring break. The director viewed this as an opportunity to garner more responses, as students would be checking their email and have the time to complete the 10-15-minute survey. A chance to win a gift card was offered as an incentive to take the final survey.

Data Analysis

Quantitative research techniques that included descriptive and inferential statistics were selected to explore the data (Gall, Gall & Borg, 2007). The Statistical Package for the Social Sciences (SPSS) was used to conduct a series of *t*-tests to determine whether there was a statistically significant difference between the means in two unrelated groups. In these tests, the dependent variable was the respondents' self-reported likelihood of eventual college graduation as indicated on a five-point Likert-type scale. Independent samples testing was chosen in this study because it allowed for the use of a Likert-type scale to be treated as a continuous scale, whereas other forms of analyses such as the logistic regression require a binary variable (Norman, 2010). Finally, because this was an exploratory study, the contrast in means provided by the *t*-tests offered a clear initial method for evaluating results.

Responses from survey items regarding demographic characteristics and student experience in high school planning for college were coded as indicator variables where a value of 1 indicates inclusion in the described group, and 0 indicates the respondent is not in that group. The demographic characteristics for which indicator values were coded, and *t*-tests were run were: Gender, English as a first language status, first-generation (other than a sibling) in family to attend college status, race/ethnic background, free and reduced lunch benefit recipient status (FRLP), whether or not gap time was taken before enrolling in college or the student had transferred, and received special education services in high school (an IEP or 504 plan). Nine categories of disability type (according to the university's classifications, see Table 1) were similarly created as indicator variables. The following were used to create indicator variables representing students' experience planning for college while in high school: Had help planning for college from a representative of an outside agency; was aware of the legal differences in gaining accommodations in high school versus at the college level; visited a college campus; talked to a college representative; contacted a college campus disability service office to see what services were offered; when the student signed up for disability services and had assistance determining how to afford college. Finally, there were two items on the survey that addressed students' experience at the university: whether anyone helped the student apply for accommodations when first enrolled in college and whether the student registered for accommodations within one year of attending college. All *t*-tests reported in Table 2 assume an unequal variance between groups. The *p* values reported in Table 2 are not corrected for multiple comparisons in the *t*-tests because of the study's small sample size. Multiple comparison corrections like Bonferroni's would introduce a large potential increase in Type II errors. With this in mind, the correction was left out and the *p* values should only be used as rough indicators to highlight groups with a large difference in means (Gelman, 2012).

Findings

Student Characteristics

Respondents were undergraduates registered with the university's disability resource office during spring quarter 2016. Of the participants (n = 260), the majority was female (65%) and 32% were male (the remainder selected "other" or were transgender). Table 2 includes respondents' self-reported demographic characteristics and affiliations. In response to the survey item, "Now that you're in college, how confident are you that you will graduate?" respondents were asked to self-predict their likelihood of graduation on a Likert-type scale. Seventy-four percent of respondents reported that they were very likely to graduate from college followed by 13%

(Likely), 9% (Not sure), 0% (Unlikely) and 1% (Very unlikely). Overall, 87% predicted that they were Very likely or Likely to graduate from college. It is important to note that this strong prediction of graduation may be influenced by volunteer bias. In addition, over 90% of respondents self-reported as enrolled beyond freshman year. Therefore, the sample may not be representative of all students with disabilities attending the university because it is skewed by an abundance of students who persisted past their first year and sought assistance by registering for disability support services.

Results Reported by Components of Kohler's Taxonomy

Quantitative analysis provided clear information about which characteristics of respondents' socio-economic status and high school activities were associated with a higher self-prediction of college completion. Specifically, statistical testing revealed differences at the $p < .05$ level between the means in six of the groups tested in independent samples tests (see Table 2). In interpreting results, the mean represents the dependent variable, which was derived from Likert-type scale responses (1 = Very likely, 5 = Very unlikely) to the survey item: "Now that you're in college, how confident are you that you will graduate?" When interpreting the results, the reader should take note that a lower mean (*M*) score result (closest to 1) indicates a higher self-prediction of graduation on the scale used, where 1 – indicates "Very Likely" to graduate. Each *t*-test provided a way to explore which variables are most related to the prediction of graduation.

Student-focused planning. Results related to IEP development, participation and planning strategies are reported under the Student-Focused Planning domain. Most respondents did not receive special education services in high school or could not remember if they had. When asked about their special education status in high school, 66% received no special education services, 13% had a 504 Plan, 7% had an IEP and 14% could not remember. Of the 17 respondents who indicated they had an IEP in high school, 72% attended an IEP meeting some of the time. When they attended their meetings, they were sometimes an active participant and of those who attended their meetings, 41% used the time to plan or prepare for college and 23% created a Summary of Performance (SOP) document. Most respondents (59%) had never heard of a SOP. Students who had an IEP in high school had a higher prediction of college graduation (M=1.07) than those who did not (M=1.44) as did students who had a 504 plan (M=1.14) and those that did not (M=1.46).

Interagency collaboration. Findings assigned to this domain link students' self-prediction of college completion to Interagency Collaboration, which involves developing relationships with multiple parties outside of the school (Test, Bartholomew & Bethune, 2015). Independent samples testing revealed two activities related to outside agencies practiced by students in high school who indicated a higher likelihood of college graduation. The first was students who talked to a representative of a college while still in high school. Specifically, the survey question asked "either in person when they visited your high school, by phone, or video chat". These students had a higher self-predicted likelihood of college graduation (M = 1.22) than those who did not talk with a representative of a college (M = 1.58). The second was the only finding related to students once enrolled at the university. Those students who registered at the disability services office when they first started or during their first year had a higher self-predicted likelihood of college graduation (M = 1.26) than those who waited and registered sometime after their first year (M = 1.62). Specifically, the survey question asked, "When did you sign-up for services at the disability service office?" and the respondents could respond by selecting either: (a) When I first started the university, (b) during my first year, (c) during my second year, and (d) sometime after my first two years. For purpose of the analysis, (a) and (b) were combined and (c) and (d) were combined to represent sometime after my first year. The accommodations most frequently received by participants were accessible instructional materials, alternative testing services and priority registration.

Family involvement. In this study, whether or not the student had received the free and reduced lunch benefit in high school was used as an indicator for family socioeconomic background. Participation in the federally funded National School Lunch Program is widely used as a proxy for low-income status since eligibility for this subsidy requires poverty level family income (Snyder & Musu-Gillette, 2015). Most of the sample (78%), did not receive free or reduced priced meals. Results of independent samples testing conducted showed that the students who did not receive the free and reduced lunch benefit in high school (M = 1.33) had a higher self-predicted likelihood of college graduation than those who did receive the benefit (M = 1.79). The survey item that queried, "Who helped you figure out how to afford college," was not significant in statistical testing in relation to the dependent variable of students' prediction of eventual graduation. Nonetheless, descriptive results indicated that family helped 59% of respondents with college affordability, 22% indicated that

they "did it myself" and 16% received helped from others who might have been a counselor, teacher, IEP team or an agency representative.

Discussion

The purpose of this study was to assess the characteristics and the college preparation activities and practices of university students with disabilities who have a higher self-prediction of college graduation. A majority of respondents in this study received no formal special education services in high school and waited until college to document their disability. Nonetheless, this result may be reflective of the population of college students with disabilities where students are less likely to have had special education in high school, i.e. only 19% of postsecondary students who were identified as having a disability by their secondary schools were reported to receive accommodations or supports from their college or university (Newman et al., 2011). While Kohler's Taxonomy is a framework for organizing transition services for those who had an IEP in high school, it also serves as a valuable structure for shaping the discussion of best practices to support the success of students with disabilities in college. The following discussion by Taxonomy level will focus on strategies for postsecondary institutions to be better prepared to serve young adults who identify for the first-time in college as having a disability.

Disability Type

Students with less detectable or apparent disabilities (e.g., learning, ADD/ADHD, mental illness/ psychological or psychiatric conditions) are most common on college campuses nationally (Raue & Lewis, 2011). This study affirms this paradigm as about 80% of respondents had psychological/emotional, learning disabilities or chronic health conditions that are often undiagnosed or misunderstood in high school. The result that deaf and hard of hearing children have a higher self-prediction of college graduation is inconsistent with findings by Newman et al., that between seventy and seventy-five percent of hearing impaired students who begin a program do not persist to completion. Nonetheless, while young people who are deaf or hard of hearing are a low-incidence population in postsecondary education (Erickson, Lee & von Schrader, 2012), research based on national data, has found high parental expectations for future educational and occupational attainment of deaf or hard of hearing children (Cawthon, Garberoglio, Caemmerer, Bond, & Wendel, 2015). In some cases, parents expected more from their children than from what children with hearing loss have historically had the opportunity to attain (Newman et al., 2011). This study's finding regarding students who are deaf and hard of hearing may not be generalizable because quality and types of accommodations can vary dramatically, depending on the campus (Pepnet 2, 2017) and deaf and hard of students accounted for only 4.2% of the sample.

Student-Focused Planning

This study's finding that respondents who had an IEP or 504 plan in high school had a higher self-prediction of college graduation should be considered in the context that most students with IEPs who do continue to postsecondary, do not attend four-year institutions. Their confidence affirms the importance of special education services especially where the IEP or 504 plan can be a vehicle for preparing students for postsecondary education by connecting students early with disability service offices, ensuring that evaluations that will be used to gain accommodations are current, and understanding how disability rights and responsibilities change between high school and college. While a student with a disability is entitled to accommodations in high school under Section 504 of The Rehabilitation Act of 1973, which requires a Free Appropriate Public Education (FAPE), in higher education it is incumbent on the student to secure their own accommodations (U.S. Department of Education, Office of Civil Rights, 2011; U.S. Government Accountability Office [GAO], 2009). The high confidence of graduation reported by special education students in this study suggests that skills acquired in high school through these services such as increased self awareness and understanding one's disability (Field and Hoffman, 1994; Kohler & Field, 2003) prepare students to act on their own behalf in college environments. This is especially important, as young adults who identified as having a disability in high school are unlikely to report their disability and seek accommodations from postsecondary institutions (Newman et al., 2011).

Interagency Collaboration

IDEA 2004 defines the term "transition services" as a coordinated set of activities for a child with a disability that is designed within a results-oriented process to facilitate the movement from school to post-school activities, including higher education [20 U.S.C. 1401(34)]. The premise of this legislative directive is that schools and families cannot successfully promote the transition of youth with disabilities into adulthood without the support of community agencies such as institutions of higher education.

(Grossi, Gilbride & Mank, 2014). This study demonstrates that students who did not self-identify as having a disability until arriving in college benefited from such collaborative efforts; that is; connecting with a college representative while in high school; either in person during a school visit or by phone or video chat. This type of outreach can be an especially important intervention strategy to reach at-risk populations such as low-income students and the disabled who may be geographically, financially or physically challenged to visit a campus. Incorporating disability services information universally in college visits to high schools could benefit special education students as well as those who may have a disability, but wait to seek support once in college. Furthermore, this study's finding that students who registered their first year at college to receive disability services had a higher self-prediction of graduation than those who registered sometime later, (Lightner, Kipps-Vaughan, Schulte & Trice, 2012) underscores the importance of increased outreach services so that students arrive on campus prepared to register for support services. Since the majority of respondents in this study had progressed beyond their freshman year, this finding has added import because it suggests that respondents had maintained an ongoing relationship with the disability services office. Thus, increasing students' awareness in high school of college disability service office resources and eligibility criteria is a likely strategy for increased persistence.

Family Involvement

Within this domain, empowerment strategies include specific methods to identify family needs (Kohler & Field, 2003). This study's finding that students who received the free and reduced lunch benefit in high school had a lower self-predicted likelihood of graduating from college was included in the Family Involvement domain because of research that demonstrates that higher family income is associated with higher levels of family involvement for students with disabilities (Newman, 2005). Even when low-income students gain access to college, they are less likely to complete college than their high-income peers (Executive Office of the President, 2014) and having more family resources, either higher incomes or higher levels of parental educational attainment, is associated with higher levels of involvement of all kinds (Newman, 2005). Specifically, one study based on a secondary data analysis of the National Longitudinal Transition Study 2 (NLTS2) found that among students with autism, parental expectations were a significant predictor of graduation from high school for students and there was a significant relationship between parental education and annual household income (Chiang, Cheung, Hickson, Xiang & Tsai, 2012).

Strengths and Limitations

Despite the speculative nature of students' self-prediction of eventual college graduation, the use of this estimate as the dependent variable in statistical testing is robust since 87% of respondents reported that they were "Very likely" or "Likely" to graduate from college. The strong graduation predictor score either inspires further confidence in that at least 76.8% of this study's respondents had continued past their first year, and students who persist beyond their first year are more likely to graduate (Horn & Carroll, 1998), or could be considered inflated since the majority of respondents are closer to completion and thus more confident in their graduation. It is important to note that this strong prediction of graduation may be influenced by volunteer bias and because respondents constituted a sample of students with disabilities who were exemplary in that they had already sought out accommodations on campus and had gained admission to a selective university campus. While this study has a strong 20% response rate (n=260), its generalizability is limited in that participants were from one large, public doctoral-granting institution in the Pacific Northwest and because of reliance on self-reported retrospective data, which might have been distorted by time and other factors.

Implications for Practice

With passage of the Every Child Succeeds Act in 2015 (Pub. L. No. 114-95 § 114 Stat. 1177), there is renewed focus on preparing students for college and careers. Four-year degree completion becomes increasingly important since most students with disabilities who pursue postsecondary education choose community colleges (Newman et al., 2011). Research shows that students who initially enroll at a four-year college are more likely to graduate compared with their counterparts who start at a two-year college (National Symposium on Postsecondary Success, 2006). Strategies based on this study's findings can be employed by university practitioners to support college persistence and graduation of high school students who are receiving special education services, have yet to document their disability or who are enrolled but are not yet registered with the campus disability service office.

Student-Focused Planning

Postsecondary institutions may consider providing increased opportunities to orient students through pre-college activities such as summer bridge programs, e-mentoring, and postsecondary academies. These programs have been described as valuable opportunities to improve students' understanding of the differences between secondary and postsecondary settings (Burgstahler & Crawford, 2007; Conner, 2012) as well as to prepare students for unstructured college environments and other independent learning conditions such as decreased student-teacher contact, long-term projects, infrequent evaluations, increased free time, and loss of familiar friend groups (Lerner, 1997; McGuire 2010). Such changes have implications for students in all of the disability areas. For example, peer mentoring can address the needs of students with Asperger syndrome, as those students tend to become isolated and reluctant to ask for help, thus jeopardizing their level of engagement (Korbel, Lucia, Wenzel & Anderson, 2011). By supporting student engagement in preparatory activities such as these, postsecondary institutions may also provide the platform for students to develop and practice critical college success skills.

Interagency Collaboration

Informing prospective students about resources provided by campus disability services offices and procedures for how to access them is recommended as a way to encourage students to access disability accommodations early on. This should include specific information about how to document your disability. The Association on Higher Education and Disability (AHEAD) recommends, as best practice, that postsecondary institutions exercise flexibility and professional judgment in evaluating students' needs, especially since the intent of the ADA Amendments Act of 2008 was to make it easier for people with disabilities to obtain protections by expanding the definition of which conditions impose a substantial limitation of a major life activity to include learning, reading, concentrating and thinking as major life activities (Shaw & Dukes, 2013). While 79% of postsecondary institutions nationally reported distributing materials designed to encourage students with disabilities to identify themselves to the institution (Raue & Lewis, 2011), intentionally integrating this information when college representatives visit high schools, during students' campus visits and through high school career and counseling centers may provide a more comprehensive approach.

Family Involvement

This study found that students who had received the free and reduced lunch benefit in high school had a lower self-prediction of eventual college graduation. To address this inequity, postsecondary institutions should consider building awareness of college level disability services to students and their families through targeted outreach to school-based organizations that offer college access supports to low-income families. This could include potentially offering to pay for assessments when necessary to document a student's disability. To the extent that postsecondary institutions can encourage family participation in gaining accommodations is important as 60% of respondents in this study reported that it was family who helped them figure out how to afford college. As such, family may play a critical role in encouraging students to meet with disability service personnel to secure supports and accommodations during the first-year of attendance. Through admissions and outreach efforts, universities have an opportunity to increase retention by educating families and their adult children about available disability support services and the opportunity to put them in place early.

Conclusion

With a growing, disability-diverse undergraduate population on college campuses, it is increasingly important to educate students about the distinct differences between high school and college disability rights and to connect students with supports early on in their undergraduate program (Korbel et al., 2011). This study demonstrates that activities such as making a connection to a campus representative while still in high school and registering early-on for campus level disability services are associated with students who predict a higher likelihood of college graduation and can be promoted by both school and college practitioners as best practices. Increasing awareness of disability supports to incoming low-income students who may be Pell Grant recipients is another important implication of this study for postsecondary institutions. Finally, since most of the respondents in this study had no formal accommodations in high school, colleges and universities may consider providing disability services information to all prospective and admitted students during pre-college and orientation activities as a way to encourage students to seek supports early on and thus prevent failure. More research to test the results of this survey based on a sample of undergraduate students with disabilities as they complete their degree rather than a self-prediction of graduation would be valuable. In addition, the series

of *t*-tests was intended as an initial exploratory way to gather information, therefore further testing using other statistical methods is recommended. Because this study was conducted at a single four-year public institution, the results are limited and by replicating the study at similar campuses, results could potentially be generalizable.

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About the Author

Dr. Julia F. Schechter completed her Ed.D. in Educational Leadership at Seattle University in 2018. She holds a B.A. degree in Politics from the University of California, Santa Cruz, and a Masters from Stanford University in Education Administration and Policy Analysis. Her experience includes working as a doctoral research assistant at the Center for Change in Transition Services at Seattle University as well as teaching at the Center for Experiential Learning and Diversity at the University of Washington. She is the founder of College Access Now and is currently a Completion Coach at South Seattle College. Her research interests include transition of students to higher education, student success and retention and completion. She can be reached by email at: schechte@seattleu.edu.

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Domain and Sub-Item	Survey Item
Student-Focused Planning	
IEP Development	• College expressed as a goal in IEP meeting.
Student Participation	• IEP attendance, Frequency of IEP attendance. • Participation Level at IEP meeting.
Planning Strategies	• Summary of Performance created. • Could explain disability and how it impacted learning. • Advocated for self to compensate for disability and get help.
Interagency Collaboration	
Collaborative Service Delivery	• Visited a college campus prior to graduating. • Talked to a college representative while still in high school. • Registered for disability services at the university.
Collaborative Framework	• Awareness of difference between gaining accommodations under IDEA or 504 in K-12 and ADA in college.
Family Involvement	
Family Involvement	• Assisted with gaining accommodations.
Family Empowerment	• Received Free and Reduced Lunch support.
Family Training	• Understood differences in disability rights between high school and college. • Provided college affordability assistance.

Figure 1. Areas Surveyed Within Kohler's Taxonomy Domains (1996)

Table 1

Survey Respondents' Disability Type and Accommodation Received at University

Characteristic	Number	Percent (n = 260)
**Disability Type *, ** **		
Deaf/Hard of Hearing	11	4.2
Mobility	16	6.2
Speech Language	4	1.5
Learning Disability	71	27.3
Blind/Visual Impairment	6	2.3
Chronic/Acute Health	36	13.8
Neurological/Nervous System	20	7.7
Psychological/Emotional	103	39.6
Multiple Disabilities	18	6.9
Other	35	13.5
Accommodation Received (by > 40 students)**		
Accessible Instructional Materials	41	15.8
Alternative Testing Services	152	58.5
Audio Recording Lectures	56	21.5
Note-taking Services	44	16.9
Priority Registration	121	46.5
Race/Ethnicity**		
American Indian/Native American	7	2.7
Asian	60	23.1
Black	6	2.3
Hispanic/Latino	23	8.8
White	187	71.9
Native Hawaiian/Pacific Islander	4	1.5
Other	19	7.3
Age		
Between 17 and 22	154	59.2
Between 23 and 30	60	23.1
Over 30	20	7.7
No Response	26	10.0
First Generation to College (other than a sibling)		
Yes	60	23.1
No or No Response	200	76.9
Free and Reduced Lunch (FRL) Benefit Recipient in High School		
Yes	48	18.5
No or No Response	212	81.5

(Continued)

Characteristic	Number	Percent (n = 260)
Gap Time Between High School and College		
No gap time	197	75.8
1-3 years	22	8.5
>3	25	9.6
No Reponse	16	6.2
Self-Reported Class Standing		
Freshman	26	10.0
Sophomore	45	17.3
Junior	78	30.0
Senior and >	76	29.2
No Response	35	13.5

Notes. *The university where the survey was conducted determined disability type categories.
** Indicates the respondent was allowed to select more than one response.

Table 2

Results of Independent Samples Test at the p <. 05 Level (where a mean score closer to 1 indicates a higher prediction of college graduation)

High School Student Practice or Characteristic	*Yes*		*No*		*p*	*df*	*t*
	M	*SD*	*M*	*SD*			
Deaf or hard of hearing	1.09	0.301	1.43	.843	.005	19,614	3.182
Had an IEP	1.07	0.258	1.44	.849	.000	42.615	4.223
Talked with a college representative	1.22	0.593	1.58	.958	.001	202,011	3.424
Signed up for disability services during their first year at university	1.26	0.648	1.62	.976	.002	163.093	3.13
Had a 504 Plan	1.14	0.351	1.46	.870	.001	91.878	3.554
Received Free and Reduced Lunch (FRL) benefit recipient	1.79	1.059	1.33	.739	.009	52,161	2.713