



Dear Ryan,

Thank you for submitting your proposal. A printable summary is below. Your confirmation number is 19863. A confirmation email will be sent to you within 24 hours.

Applicants will be notified of the status of the proposed project on February 2, 2018.

If you have questions or need assistance regarding your application please contact the AIR Grant staff at 850-391-7109 or grants@airweb.org.

SUMMARY

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Discipline of highest degree	
Position description	
Staff members in IR office	
Campus type	
Years of experience in IR	
IR Roles	
Year of birth	
Race/Ethnicity	
Gender	

Grant Type

I am applying for a:

Research Grant

Financial Representative

Name

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Additional Contacts**Project Description****Project title:**

Graduate and Professional Education for Students with Disabilities: Examining Access to STEM, Medical, and Legal Fields

Statement of the research problem and national importance (limit 750 words):

- What is the research problem this proposal intends to address?
- How does this topic relate to the research priorities areas of access, affordability, and value of legal or graduate/professional education?
- Why is this topic of national importance?
- Why is it timely to conduct this research at this time?

Research Problem

This project addresses the under-representation of students with disabilities in graduate and professional education. Looking specifically at STEM, medical, and legal fields of study, this project examines how a) lack of affordability and b) positive aspirations for further education, may play a role in disproportionate access to graduate and professional education.

People with disabilities have been historically marginalized and consistently underrepresented at all levels of education. The Individuals with Disabilities Act (IDEA) in the 1970s changed the landscape for K-12 education, increasing access for many students. In 1990, the Americans with Disabilities Act (ADA) was passed, and since that time students with disabilities have entered post-secondary institutions at greater rates (United States Government Accountability Office, 2009). Recent estimates put the proportion of college students with disabilities at around 11% (Snyder & Dillow, 2013), but the rates are actually higher, given that these figures do not capture a significant number of students who do not disclose their disability status to their campus (Cawthon & Cole, 2010). With the increasing number of students with disabilities entering baccalaureate education, the next logical issue is to better understand how accessible graduate and professional education is for this underrepresented group.

Research on college students with disabilities is sparse at all levels (Kimball, Wells, Ostiguy, Manly & Lauterbach, 2016; Peña, 2014), but especially so for graduate and professional education. Education researchers know relatively little about the pipeline into and through post-baccalaureate education for this group. This research aims to add to knowledge in three specific areas of graduate and professional education that are of national importance, and in which evidence exists that students with disabilities are underrepresented: a) science, technology, engineering, and mathematics (STEM), b) medical and health-related fields, and c) legal education.

National importance

Research on students with disabilities in STEM, medical, and legal education is of national importance for two main reasons. First, there is a pressing equity concern. Students with disabilities are supposed to be legally guaranteed a level playing field in education, and yet limited opportunities continue to diminish their upward mobility. This contributes to social inequality, evidenced by the fact that people with disabilities have lower average incomes and higher poverty rates than individuals without disabilities (Brault, 2012). As STEM, medical, and legal occupations provide good incomes,

secure employment, and the promise of economic mobility, unequal access to these types of professions is a national equity concern.

Second, there is a recognized need for greater diversity in our national labor force. Diversity of experience has benefits related to innovation and to serving a diverse population well. This has been articulated by the AccessLex Institute, who state on their website an aim of helping schools to “pursue a diverse and inclusive institution that embraces, promotes, and engages the varying thoughts, abilities, needs, perspectives and backgrounds of its students and the legal community” (italics added). In the medical field, doctors with disabilities are valuable to have not only as physicians for other people with disabilities, but for their diverse viewpoints and experiences with healthcare systems (Khullar, 2017). There is a similar recognition of the benefits of diversity in STEM fields nationally (NSF, 2017).

Timeliness

Graduate and professional schools are actively trying to increase diversity in their student populations given the benefits for campuses and for the students themselves. Disability, however, is a form of diversity that is often not fully considered and rarely discussed the way race/ethnicity, economic disadvantage, or gender are. Given the national importance outlined above, additional information about this population could help to improve this situation. Additionally, as undergraduate degrees become the de facto requirement for good incomes and social mobility, graduate degrees and professional education are increasingly used by students to advance skills and knowledge to attain credentials that are of value to employers. Graduate degrees have become a more distinguishing factor of hiring and, therefore, it is essential to examine the ways in which students with disabilities may not have equitable opportunities to access this level of education, disadvantaging them in competing with their increasingly highly educated peers. The time is right for a clearer understanding of disparities in access to graduate and professional education for this group of students, and the role that affordability and aspirations may play in this process. Without such information universities, employers, and policymakers may not be realizing the full educational and workforce potential of people with disabilities, and may also be contributing to inequality for this historically underserved group.

Review the literature and establish a theoretical grounding for the research (limit 1000 words):

- What has prior research found about this problem?
- What is the theoretical/conceptual grounding for this research?

Prior Research

While there is relatively little research about graduate education and disability, related literature indicates problems with equitable access. Stigma against those with disabilities has been documented across the academic career trajectory (Collinson & Penketh, 2010). In medical education, for example, those with disabilities may be disproportionately disadvantaged in the admissions process (Santen, Davis, Brady, & Hemphill, 2010). More broadly, pervasive stigma toward people with disabilities often leads to suppressed educational outcomes (Markoulakis & Kirsh, 2013; May & Stone, 2010). There are also specific concerns within each field that this study proposes to examine.

STEM education. The STEM workforce is experiencing a shortage of qualified labor and calls have been made to cast a wide net to remedy this situation (NSF, 2017). Despite this, STEM fields have some of the lowest enrollment rates of students with disabilities, as low as 4% in some fields (NSF, 2017). Among those earning a doctorate, this drops below 1% in engineering fields specifically. There are several factors which may contribute to this phenomenon. Students often do not have STEM role models, may experience misperceptions about their abilities, often are not provided with adequate counseling, and may encounter faculty who lack skills with appropriate inclusive pedagogies (Dunn, Rabren, Taylor & Dotson, 2012; Moriarty, 2007; Shifrer, 2013; Shifrer, Callahan & Muller, 2013).

Medical Education. Although dated, estimates indicate that only about one to two percent of students in medical school have disabilities (DeLisa & Thomas, 2005). Part of this underrepresentation may have to do with the fact that many medical schools do not adequately follow the Americans with Disabilities Act in providing reasonable accommodations for students (Zazove et al., 2016). There is also a perception among medical school personnel that impairments affecting the ability to observe or communicate may be particularly challenging in this field (VanMartre, Nampiaparampil, Curry & Kirschner, 2013).

Legal Education. Lawyers need to be capable of responding appropriately to the diverse nature of the communities within which they will work (Isreal, Skead, Heath, Hewitt, Galloway & Steel, 2017). Despite the recognition of the need for diversity by groups such as the AccessLex Institute, access to law education for students with disabilities is still a largely overlooked issue. The extant research most often examines appropriate accommodations (or the lack thereof) (Engel & Konefsky, 1990; Eichhorn, 1997; Runyan & Smith, 1991; Adams, 1998). For example, a recent lawsuit contended that blind students were not provided with appropriate accommodations and supports regarding web-based materials (Lee, 2014). Despite such information, there is significant lack of research concerning initial access to the field and the underlying causes of underrepresentation for students with disabilities.

Research with the most recent national data can provide an updated look at the changing landscape and the current inequities in these fields. Additionally, this study will improve understanding of how disparities begin by looking at the role of aspirations, given that students with disabilities may be discouraged from pursuing further education. Additionally, disparities may be due to affordability. Undergraduate loan debt, which is likely to be higher for students with disabilities due to the additional costs they incur, might make the additional debt required to attend graduate school seem unreasonable.

Aspirations

The key role of aspirations in future occupational success is well established, starting with sociological status attainment models (Sewell, Haller & Portes, 1969). While occupational aspirations of students with disabilities have been studied (Rojewski, 1996a, 1996b, 1999; Rojewski, Lee, Gregg, & Gemici, 2012), most of this research is dated given a changing context, and does not explicitly examine aspirations for graduate school. Because students with disabilities may receive negative signals regarding their capability (Sharma, Forlin, & Loreman, 2008; Vickerman & Blundell, 2010; Gabel & Miskovic, 2014) and social discourses of utility and economic efficiency further marginalize this group (Yates & Roulstone, 2013), aspirations are likely to be lowered. We presume that even for students who successfully graduate from college, aspirations for additional education may be lowered based on numerous factors, which is likely to hinder access to graduate and professional education.

Student Debt

About two-thirds of college graduates have student loans to repay (Cochrane & Cheng, 2016). For some, the resulting debt is a major detriment to their financial stability after college. Students with disabilities have different financial aid patterns than other students (Bittinger, 2016; Wolanin, 2005), and yet we know very little about their student loan behaviors and outcomes. However, costs for education for this population are higher on average.

Calculations of cost ignore fee-based services, increased living expenses, and other hidden costs of attendance that students with disabilities often require to be successful. Because they encounter college costs that others do not, they may need to borrow more, and therefore may experience disparate loan-based outcomes even after graduation. Higher debt, based on greater college expenses for students with disabilities, is likely to affect pursuit of graduate or professional education if students see their existing debt as an affordability barrier.

Conceptual Grounding

The proposed work is framed by the concept of cumulative (dis)advantage. Rooted in Merton's work on the Matthew Effect (1968, 1988), this is a formalized way of examining how the "rich get richer" or "the poor get poorer." In educational research, cumulative (dis)advantage is used as a framework to describe processes that lead to growing inequality (DiPrete & Eirich, 2006). In our case, students with disabilities are disadvantaged in K-12 education by schooling practices, policies, and structures that lead to lower rates of success and lower rates of college enrollment (Kimball et al., 2016). For those who go to college, they have higher dropout rates as well as longer time to degree when they do complete (Mamiseishvili & Koch, 2011). Such factors are also likely to decrease students' aspirations for further education. A longer time to a degree also contributes to increased costs for this group, leading to increased student loan borrowing rates, making graduate or professional school less affordable. In all, these accumulated disadvantages likely lead to diminished access to graduate and professional education.

Describe the research method that will be used (limit 1000 words):

- What are the research questions to be addressed?
- What is the proposed research methodology?
- What is the statistical model to be used?

Research Questions

The purpose of this research is to better understand factors affecting access to graduate and professional education for students with disabilities. Specifically, we address the following research questions:

1. To what extent is there a disparity in access to graduate and professional education for students with disabilities relative to other students?
2. To what extent are there disparities in access to STEM, medical, and legal education specifically?
3. How do differences in aspirations for graduate or professional education influence these disparities?
4. How do differences in student debt load influence these disparities?

Research Methodology

This study uses the Baccalaureate and Beyond Longitudinal Study (B&B:08/12), for which more detail is provided below. With these data, the study is designed with four analytic components: descriptive analysis, mean comparisons, logistic regression, and predicted probabilities.

Descriptive analysis. The first step is to provide a descriptive picture of the sample, and specifically the subsample of students with disabilities. We will calculate means, standard deviations and ranges of all variables in the study, and will do this separately for students with disabilities and other students. From these analyses, we will be able to examine the proportions of students who enrolled in graduate or professional school, as well as the proportions that enrolled in STEM, medical, and legal fields specifically.

Group mean comparisons. To address our first two research questions, we analyze group mean comparisons between students with and without disabilities. We will do this for the dependent variables in this study: enrollment in any graduate or professional education, and enrollment in STEM, medical, and legal education specifically. We also run these group mean comparisons for all other variables in the study. This provides a first look at the extent to which there are differences between these two groups in a) aspirations for graduate education, and b) student loan debt.

Logistic regression. Logistic regression analysis will be used to further our understanding of the first two research questions, and to specifically address the third and fourth research questions. Logistic regression is the appropriate technique given the binary nature of our dependent variables: a) enrollment in any graduate or professional education, b) enrollment in STEM, c) enrollment in medical fields, and d) enrollment in law school. We use parallel regression models across all of these dependent variables, as outlined below. Because the B&B data collection followed a complex sampling strategy, all analyses account for this and also weight the analyses per standards from the National Center for Education Statistics (NCES).

First, the primary independent variable of disability status is added to the regression model in order to better understand the relationship to each outcome (see Equation 1). This binary variable encompasses all students who indicated on the survey that they had a disability. While disaggregation of this variable into separate disability types (e.g., mobility impairments, learning disabilities, etc.) is desirable for future research, a broad understanding of this group needs to first be established given the lack of current research. Other data will need to be used for a more detailed future analysis, given that sub-sample sizes by individual disability types are too small in B&B.

$$y = \beta_0 + \beta_1 * \text{Disability Status} + \text{Error} \quad (1)$$

Subsequent to adding the disability variable, we will separately add independent variables representing whether or not a student had aspirations for graduate or professional education, as well as their student loan debt upon graduation (see Equation 2). In addition to seeing how these factors are associated with the outcomes, the analysis allows one to understand the extent to which these factors may be partially responsible for the disparities revealed in the first model, without these factors included.

$$y = \beta_0 + \beta_1 * \text{Disability Status} + \beta_2 * \text{Aspirations} + \beta_3 * \text{Loan Debt} + \text{Error} \quad (2)$$

Next, we will add a set of control variables, based on past research and theory examining graduate education, which are available in B&B: demographics (e.g., gender, race/ethnicity, age, socioeconomic status) and academic factors in undergraduate education (e.g., GPA, attendance intensity, major, institutional level) (see Equation 3).

$$y = \beta_0 + \beta_1 * \text{Disability Status} + \beta_2 * \text{Aspirations} + \beta_3 * \text{Loan Debt} + \beta_4 * \text{Demographics} + \beta_5 * \text{Academics} + \text{Error} \quad (3)$$

The research questions ask how aspirations and debt load may influence disparities in graduate or professional enrollment. While the model above partially addresses that question, it may be the case that the relationships between aspirations and enrollment, and/or debt and enrollment, are different for students with and without disabilities. Therefore, we also examine a moderation model by entering interaction variables. The first is an interaction between disability and aspirations, which will show how aspirations may influence actual enrollment differently for this group. Similarly, we will include an interaction between disability and debt load (see Equation 4).

$$y = \beta_0 + \beta_1 * \text{Disability Status} + \beta_2 * \text{Aspirations} + \beta_3 * \text{Loan Debt} + \beta_4 * \text{Demographics} + (4) \\ \beta_5 * \text{Academics} + \beta_6 * \text{Aspiration*Disability Status} + \beta_7 * \text{Loan Debt*Disability Status} + \text{Error}$$

Predicted probabilities. Using results from the full regression model, we will calculate predicted probabilities of enrollment in each field for different "ideal types" of students (Long & Freese, 2014, p. 278). The probabilities for attending graduate or professional education will be calculated by varying only the disability, aspirations, and debt variables, while holding all other values at their within-group means. For example, a probability of enrollment will be calculated for a student with a disability and with a) high aspirations, and high debt, b) high aspirations and low debt, c) low aspirations and high debt, and d) low aspirations and low debt. The same types of probabilities will be calculated for a student without a disability. This type of analysis provides a more intuitive metric and allows for a clear visual representation by which to understand the salience of disability relative to the outcomes, and how aspirations and loan debt contribute to disparities individually and jointly.

References cited (no word limit):

- Adams, S. J. (1998). Leveling the floor: Classroom accommodations for law students with disabilities. *Journal of Legal Education*, 48(2), 273–296.
- Bittinger, J. (2016). Intersection of the costs of disability and postsecondary education. Presented at the Association for the Study of Higher Education Annual Meeting, Columbus, OH.
- Brault, M. W. (2012). *Americans with disabilities: 2010* (Current Populations Reports No. P70-131). Washington D.C.: U.S. Census Bureau.
- Cawthon, S. W., & Cole, E. V. (2010). Postsecondary students who have a learning disability: Student perspectives on accommodations access and obstacles. *Journal of Postsecondary Education and Disability*, 23(2), 112–128.
- Cochrane, D., & Cheng, D. (2016). *Student debt and the class of 2015*. Oakland, CA: The Institute for College Access and Success.
- Collinson, C., & Penketh, C. (2010). "Sit in the corner and don't eat the crayons": Postgraduates with dyslexia and the dominant "lexic" discourse. *Disability & Society*, 25(1), 7–19.
- Cominole, M., Shepherd, B., Siegel, P. & Socha, T. (2015). 2008/12 Baccalaureate and Beyond Longitudinal Study (B&B:08/12). Data File Documentation (NCES 2015-141). Washington, D.C.: National Center for Education Statistics. Retrieved from <https://eric-ed-gov.silk.library.umass.edu/?id=ED560733>
- DeLisa, J. A., & Thomas, P. (2005). Physicians with disabilities and the physician workforce: A need to reassess our policies. *American Journal of Physical Medicine & Rehabilitation*, 84(1), 5–11. doi:10.1097/01
- DiPrete, T. A., & Eirich, G. M. (2006). Cumulative advantage as a mechanism for inequality: A review of theoretical and empirical developments. *Annual Review of Sociology*, 32, 271–297.
- Dunn, C., Rabren, K. S., Taylor, S. L., & Dotson, C. K. (2012). Assisting students with high-incidence disabilities to pursue careers in science, technology, engineering, and mathematics. *Intervention in School and Clinic*, 48(1), 47–54. doi:10.1177/1053451212443151
- Eichhorn, L. A. (1997). Reasonable accommodations and awkward compromises: Issues concerning learning disabled students and professional schools in the law school context (SSRN Scholarly Paper No. ID 1296104). Rochester, NY: Social Science Research Network. Retrieved from <https://papers.ssrn.com/abstract=1296104>
- Engel, D. M., & Konefsky, A. S. (1990). Law students with disabilities: Removing barriers in the law school community. *Buffalo Law Review*, 38, 551–590.
- Gabel, S. L., & Miskovic, M. (2014). Discourse and the containment of disability in higher education: An institutional analysis. *Disability & Society*, 1145–1158. doi:10.1080/09687599.2014.910109
- Israel, M., Skead, N., Heath, M., Hewitt, A., Galloway, K., & Steel, A. (2017). Fostering "quiet inclusion": Interaction and diversity in the Australian law classroom. *Journal of Legal Education*, 66(2), 332.
- Khullar, D. (2017, July 11). Doctors with disabilities: Why they're important. *The New York Times*. Retrieved from <https://www.nytimes.com/2017/07/11/upshot/doctors-with-disabilities-why-theyre-important.html>
- Kimball, E., Wells, R. S., Lauterbach, A., Manly, C., & Ostiguy, B. (2016). Students with disabilities in higher education: A review of the literature and an agenda for future research. In *Higher Education: Handbook of Theory and Research* (Paulsen M. (Ed.), Vol. 31, pp. 91–156). The Netherlands: Springer.
- Lee, B. A. (2014). Students with disabilities: Opportunities and challenges for colleges and universities. *Change*, 46(1), 40–45. doi:10.1080/00091383.2014.867212
- Long, J. S., & Freese, J. (2006). *Regression models for categorical dependent variables using Stata*. College Station, TX: Stata Press.
- Mamiseishvili, K., & Koch, L. C. (2011). First-to-second-year persistence of students with disabilities in postsecondary institutions in the United States. *Rehabilitation Counseling Bulletin*, 54(2), 93–105. doi:10.1177/0034355210382580

- Markoulakis, R., & Kirsh, B. (2013). Difficulties for university students with mental health problems: A critical interpretive synthesis. *The Review of Higher Education*, 37(1), 77–100. doi:10.1353/rhe.2013.0073
- May, A. L., & Stone, C. A. (2010). Stereotypes of individuals with learning disabilities: Views of college students with and without learning disabilities. *Journal of Learning Disabilities*, 43(6), 483–499. doi:10.1177/0022219409355483
- Merton, R. K. (1968). *Social theory and social structure*. New York: Simon and Schuster.
- Merton, R. K. (1988). The Matthew Effect in science, II: Cumulative advantage and the symbolism of intellectual property. *Isis*, 79(4), 606–623.
- Moriarty, M. A. (2007). Inclusive pedagogy: Teaching methodologies to reach diverse learners in science instruction. *Equity & Excellence in Education*, 40(3), 252–265. doi:10.1080/10665680701434353
- National Science Foundation, National Center for Science and Engineering Statistics (2017). *Women, minorities, and persons with disabilities in science and engineering: 2017 (Special Report No. 17–310)*. Arlington, VA: National Science Foundation. Retrieved from <http://www.nsf.gov/statistics/wmpd>
- Peña, E. V. (2014). Marginalization of published scholarship on students with disabilities in higher education journals. *Journal of College Student Development*, 55(1), 30–40. doi:10.1353/csd.2014.0006
- Rojewski, J. W. (1996a). Educational and occupational aspirations of high school seniors with learning disabilities. *Exceptional Children*, 62(5), 463–476. doi:10.1177/001440299606200506
- Rojewski, J. W. (1996b). Occupational aspirations and early career-choice patterns of adolescents with and without learning disabilities. *Learning Disability Quarterly*, 19(2), 99–116. doi:10.2307/1511251
- Rojewski, J. W. (1999). Occupational and educational aspirations and attainment of young adults with and without LD 2 years after high school completion. *Journal of Learning Disabilities*, 32(6), 533–552. doi:10.1177/002221949903200606
- Rojewski, J. W., Lee, I. H., Gregg, N., & Gemici, S. (2012). Development patterns of occupational aspirations in adolescents with high-incidence disabilities. *Exceptional Children*, 78(2), 157–179. doi:10.1177/001440291207800202
- Runyan, M. K., & Smith, J. F. (1991). Identifying and accommodating learning disabled law school students. *Journal of Legal Education*, 41(3), 317–349.
- Santen, S. A., Davis, K. R., Brady, D. W., & Hemphill, R. R. (2010). Potentially discriminatory questions during residency interviews: Frequency and effects on residents' ranking of programs in the national resident matching program. *Journal of Graduate Medical Education*, 2(3), 336–340.
- Sewell, W. H., Haller, A. O., & Portes, A. (1969). The educational and early occupational attainment process. *American Sociological Review*, 34(1), 82–92. doi:10.2307/2092789
- Sharma, U., Forlin, C., & Loreman, T. (2008). Impact of training on pre-service teachers' attitudes and concerns about inclusive education and sentiments about persons with disabilities. *Disability & Society*, 23(7), 773–785. doi:10.1080/09687590802469271
- Shifrer, D. (2013). Stigma of a label: Educational expectations for high school students labeled with learning disabilities. *Journal of Health and Social Behavior*, 54(4), 462–480. doi:10.1177/0022146513503346
- Shifrer, D., Callahan, R. M., & Muller, C. (2013). Equity or marginalization? The high school course-taking of students labeled with a learning disability. *American Educational Research Journal*, 2831213479439. doi:10.3102/0002831213479439
- Snyder, T. D., & Dillow, S. A. (2013). *Digest of education statistics, 2012 (No. NCES 2014015)*. Washington, DC: National Center for Education Statistics.
- United States Government Accountability Office (2009). *Higher education and disability: Education needs a coordinated approach to improve its assistance to schools in supporting students*. Washington, DC: United States Government Accountability Office. Retrieved from <http://www.gao.gov/products/GAO-10-33>
- VanMatre, R. M., Nampiamparmpil, D. E., Curry, R. H., & Kirschner, K. L. (2004). Technical standards for the education of physicians with physical disabilities: Perspectives of medical students, residents, and attending physicians. *American Journal of Physical Medicine & Rehabilitation*, 83(1), 54–60. doi:10.1097/01
- Vickerman, P., & Blundell, M. (2010). Hearing the voices of disabled students in higher education. *Disability & Society*, 25(1), 21–32. doi:10.1080/09687590903363290
- Wolanin, T. (2005). Students with disabilities: Financial aid policy issues. *Journal of Student Financial Aid*, 35(1), 17–26.
- Yates, S., & Roulstone, A. (2013). Social policy and transitions to training and work for disabled young people in the United Kingdom: Neo-liberalism for better and for worse? *Disability & Society*, 28(4), 456–470. doi:10.1080/09687599.2012.717874
- Zazove, P., Case, B., Moreland, C., Plegue, M. A., Hoekstra, A., Ouellette, A., & Fetters, M. D. (2016). U.S. medical schools' compliance with the Americans

with disabilities act: Findings from a national study. Journal of the Association of American Medical Colleges, 91(7), 979–986.
doi:10.1097/ACM.0000000000001087

Project Description - Appendix

There are no files attached.

Datasets

List the datasets that will be used and explain why they best serve this research (limit 500 words)

This study uses the most recent nationally representative dataset available - the Baccalaureate and Beyond Longitudinal Study (B&B:08/12). The B&B examines students' education and work experiences after they complete a bachelor's degree. The dataset consists of students who completed requirements for a bachelor's degree between July 1, 2007, and June 30, 2008, at a postsecondary institution in the United States and Puerto Rico. Students were sampled from the National Postsecondary Student Aid Study (NPSAS:08), resulting in the B&B:08/12 sample including 17,172 students. The sample was followed-up one year (2009) and four years (2012) after graduation (Cominole, Shepherd, Siegel & Socha, 2015). During the first data collection, students provided extensive information on their demographic characteristics as well as academic and family background. Two follow-ups collected information on students' education and work experiences, including their participation in graduate or professional education.

With this data collection, variables exist for the key facets of the proposed study:

- Enrollment in any graduate or professional education.
- Type of graduate or professional program enrolled in, including STEM, medical/health, and legal fields.
- Disability, asked about in multiple formats, both as a self-report of disability identity and as a functional self-assessment regarding impairments that may limit daily function.
- Aspirations for graduate school, measured in the last year of undergraduate education.
- Student loan debt accumulated as of graduation from college (because B&B is a longitudinal extension of the NPSAS these data are of high quality, gathered from external sources rather than self-report).
- All control variables referred to above.

The B&B dataset is the best source to address our research questions for three main reasons. First, these are the most recent nationally generalizable data to examine the post-baccalaureate trajectories for college graduates, which also include information about STEM, medical, and legal fields specifically. Second, because B&B is a longitudinal extension of the NPSAS data collection, there is extensive information about the financial situation of students. To be able to have detailed information about debt load upon graduation allows this study to examine affordability in relation to graduate education, which other datasets do not. Finally, B&B is unique in asking a robust set of questions concerning students' disability status. This allows us to examine the subpopulation of interest, which is often not the case with many datasets. Specifically, there were approximately 1,230 students with disabilities in the dataset, which is an adequate number for the statistical analyses described above.

Statement of use of restricted datasets (limit 250 words):

Applicants should provide a statement indicating whether the proposed research will require use of restricted datasets. If restricted datasets will be used, the plan for acquiring the appropriate license should be described.

If restricted datasets will not be used, leave this text box blank and click *Save and Continue*.

Principal investigator Dr. Ryan Wells has a current restricted data license from the National Center for Education Statistics (# 08090014) and is approved to access and use the B&B dataset, as well as the NPSAS dataset on which it was based. If awarded a grant, he will add a graduate assistant user to this restricted license.

Timeline and Deliverables

Timeline:

Provide a timeline of key project activities.

March 1, 2018 Receive funding and begin research project

April - May Work with B&B restricted dataset to clean, condition, and prepare data and create needed variables

June - Aug Run all preliminary statistical analyses; conduct comprehensive literature review

Sept - Oct Write preliminary results, and re-run any analyses as necessary

November 11 -12 Present at the 2018 AccessLex Legal Education Research Symposium in Scottsdale, AZ

November 15-17 Present at the 2018 ASHE Annual Conference

December Write implications for policy and practice; re-run analysis and/or re-write sections as necessary given conference feedback

Jan - Feb, 2019 Peers review draft papers; Re-analyze and re-write as needed

February 28 Project period ends

April 30 Final report and related documents submitted to AIR

May 27-31 Present results at the AIR Annual Forum in Denver, CO

Deliverables:

List deliverables such as research reports, books, and presentations that will be developed from this research initiative.

This project will have six deliverables. First, there are the two required deliverables in accordance with the grant funding guidelines. This includes a presentation at the 2018 AccessLex Legal Education Research Symposium in Scottsdale, AZ, and a final report due to AIR at the end of the funding period. In addition, we aim to deliver two additional presentations from this research, each of which will lead to a peer reviewed journal article. These products are detailed below.

Graduate and Professional Education for Students with Disabilities: Examining Access to STEM, Medical, and Legal Fields

- Presentation at the 2018 ASHE Annual Meeting
- Peer-reviewed journal article

Aspirations, Debt Load, and Access to Graduate & Professional Education

- Presentation at AIR Forum 2019
- Peer-reviewed journal article

Disseminate results:

Describe how you will disseminate the results of this research.

(Note: Costs of travel to meetings should be calculated on the budget page.)

The dissemination plan includes the deliverables described above. The first presentation and paper, tentatively titled Graduate and Professional Education for Students with Disabilities: Examining Access to STEM, Medical, and Legal Fields, will include all of the results from the descriptive analyses above, corresponding to research questions #1 and #2. A descriptive update will be useful to a variety of stakeholders and will be targeted for publication in the Journal of Postsecondary Education and Disability or The Review of Higher Education.

Our second presentation and paper, tentatively titled Aspirations, Debt Load, and Access to Graduate & Professional Education, addresses the third and fourth research questions above, and includes all regression and predicted probability analyses. We plan to present this paper at the 2019 Annual Forum for the Association for Institutional Research in Denver, CO and subsequently submit it to either Research in Higher Education or Journal of Higher Education for publication.

In addition to these standard scholarly venues, we will also disseminate results through other outlets. Specifically, the Center for Student Success Research at the University of Massachusetts Amherst, directed by Dr. Ryan Wells, will disseminate presentations and papers via their website, as well as through the Center's Twitter presence. Given that the Center has an active working group and affiliates interested in the topic of disability in higher education, we will be able to reach additional audiences through this mechanism that we would otherwise not be able to reach.

IRB Statement

Statement of Institutional Review Board approval or exemption (limit 250 words):

As part of the proposal, a statement outlining a plan for Institutional Review Board (IRB) approval is required. The statement should outline the applicant's timeline and plan for submitting the proposal to an IRB or explain why IRB approval is not necessary. Final IRB action is not necessary prior to submitting the application.

Principal Investigator Dr. Ryan Wells is in the process of submitting this research project for approval to the University of Massachusetts Amherst Institutional Review Board (IRB). It is likely to receive "exempt" status from the board given that it is secondary data analysis and poses no additional risk to the participants, similar to other research he has conducted using these data in the past. Nonetheless, and particularly since the project uses restricted data, he will follow all IRB procedures and ensure that he receives IRB exempt status prior to March 1, 2018.

Biographical Sketch(es)

Biographical sketch (limit 750 words):

Dr. Ryan Wells is an associate professor of higher education at the University of Massachusetts Amherst, and Director of the Center for Student Success Research. He earned his PhD in higher education from the University of Iowa. Prior degrees include a B.S. in Industrial Engineering from Iowa State University and a M.A. in the Social Foundations of Education from the University of Iowa.

Dr. Wells has considerable experience using and analyzing national datasets, primarily from NCES, and has attended multiple database training workshops. Using these national databases, he has conducted studies related to college student access and success, which have been published in Research in Higher Education, Journal of Higher Education, Higher Education, and Teachers College Record, among others. This accumulated expertise led to authoring a chapter in the second edition of Research in the College Context, edited by Stage and Manning, entitled "Large National Datasets."

Selected relevant research, either using NCES datasets and/or addressing disability includes:

Wells, R., Wolniak, G., Engberg, M. & Manly, C. (2016). Socioeconomic disparities in the use of college admission-enhancing strategies among high school seniors from the 1990s to 2000s. *Teachers College Record*, 118(9), 1-36.

Kimball, E., Wells, R., Ostiguy, B., Manly, C., & Lauterbach, A. (2016). Students with disabilities in higher education: A review of the literature and an agenda for future research. In M. Paulsen (Ed.), *Higher Education: Handbook of Theory and Research* (pp. 91-156). Switzerland: Springer International.

Vaccaro, A., Kimball, E., Ostiguy, B. & Wells, R. (2015). Researching students with disabilities: The importance of critical perspectives. In R. Wells & F. Stage (Eds.) *New scholarship in critical quantitative research –New Directions for Institutional Research* (pp. 25-41).

Wells, R. & Lynch, C. (2014). Volunteering for college? Potential implications of financial aid tax credits rewarding community service. *Educational Policy*, 28, 812-844.

Wells, R., Bills, D. & Devlin, M. (2014). The work-to-college transition: Postsecondary expectations and enrolment for young men and women in the US labour force. *Journal of Vocational Education & Training*, 66(2), 113-134.

Wells, R. & Lynch, C. (2012). Delayed entry: The influences of family income, parental education, and parental occupation on the college transition. *Journal of Higher Education*, 83(5), 671-697.

This project is an extension of Dr. Wells' professional and personal interests in improving higher education for underserved populations. He has specifically examined these topics for students with disabilities in recent publications and presentations on topics related to STEM enrollment, aspirations, and how to do research with this population of students. This project will extend that work in a meaningful direction specific to graduate and professional education. He will be able to carry out this study as proposed because it capitalizes on his past research experience with large datasets and quantitative methods. He will benefit from this process by expanding his research focus and by allowing him to apply his quantitative skills to a timely topic for higher education in the U.S. today.

Budget

- [Wells AIR Proposal Budgetv2](#)

Funding History

Funding history (limit 250 words):

A statement of prior, current, and pending funding for the proposed research from all sources is required. The statement should also include a history of all prior funding from AIR to any of the PIs for any activity. Funding from other sources will not disqualify the application but may be considered in the funding decision.

This project has not received any other funding, nor are there any funding proposals pending for this research project.

Ryan Wells received a \$15,000 2007-2008 Dissertation Grant and a \$39,918 2009-2010 Research Grant from AIR.

Dissertation Advisor Letter of Support

There are no files attached.

How Did You Hear About This Grant Opportunity?

Check all that apply:

- AccessLex Institute website or direct communication
- American Educational Research Association (AERA)
- Association for Institutional Research (AIR) website or direct communication
- Other (please list below)

N/A



Research Grant Proposal Budget Form



Name: Ryan Wells

Personnel - Salary

Principal Investigator	\$	<input type="text" value="18,238"/>
Second Principal Investigator	\$	<input type="text" value="0"/>
Third Principal Investigator	\$	<input type="text" value="0"/>
Graduate Research Assistant	\$	<input type="text" value="29,152"/>

Travel

2018 AccessLex Institute Legal Education Research Symposium: Principal Investigator	\$	<input type="text" value="1,213"/>
2018 AccessLex Institute Legal Education Research Symposium: Second Principal Investigator	\$	<input type="text" value="0.00"/>
2018 AccessLex Institute Legal Education Research Symposium: Third Principal Investigator	\$	<input type="text" value="0.00"/>
2018 AccessLex Institute Legal Education Research Symposium: Graduate Research Assistant*	\$	<input type="text" value="1,213"/>
Other research related travel:	\$	<input type="text" value="0.00"/>

(*Note*: Other planned travel should be listed in the "Timelines and Deliverables" section)

Other research expenses

<i>Please provide a breakdown of expenses below and add the total value in the box to the right. Allowable expenses include: materials, such as software, books, supplies, etc.; consultant services, such as transcription, analysis, external researchers, etc.; and costs for publishing articles in journals. The purchase of computer hardware, overhead or indirect costs, and living expenses are not allowable. If you have questions about specific expenditures, please contact AIR.</i>	\$	<input type="text" value="0.00"/>
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TOTAL REQUESTED – Maximum Allowable is \$50,000 \$

**Note: The AccessLex Institute believes graduate student professional development and mentoring opportunities are important aspects of the Research Grant Program. Therefore, Research Grant recipients are strongly encouraged to designate funds for graduate student travel for the AccessLex Institute Legal Education Research Symposium Presentation.*