

## Dear Nayoung,

Thank you for submitting your proposal. A printable summary is below. Your confirmation number is 11423. 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, 2016.

If you have questions or need assistance regarding your application please contact the AIR Grant staff at 850-385-4155 x109 or grants@airweb.org.

# SUMMARY

| Personal Information      |  |  |  |  |  |
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| Highest degree               |  |
|------------------------------|--|
| 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:

Dissertation Grant

**Financial Representative** 

Name

Mirela Munteanu

Affiliation

# 12/30/2015

|                                | - |
|--------------------------------|---|
| Financial Representative       |   |
| Department                     |   |
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| United States                  |   |
|                                |   |

**Project Description** 

Project title:

#### The effect of Title IX on gender disparity in graduate education.

#### 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?

A phenomenon that has been extensively documented by researchers is the convergence in the U.S. occupational distribution between men and women over the past 50 years. Between 1960 and 2000, the share of male lawyers decreased by over 30 percent--from 96 percent to 66 percent--while the female share increased by over 700 percent (Ruggles et. al 2010). Similar changes occurred among other high-skilled occupations. Of particular interest to researchers and policy-makers alike is the reason behind this convergence – what are the factors that contributed to reducing gender disparity and increasing female access to previously male-dominated occupations, like the legal profession?

Noting that much of the convergence occurred within high-skilled occupations, I posit that barriers to higher education played a significant role in females' occupational choices. I seek to estimate the impact of Title IX, which banned gender discrimination in graduate school admissions, on female educational choices. This 1972 law came at a time when women faced substantial inequality in education. Elite colleges and universities had quotas for the admission of women, and women often needed higher test scores and grades than their male peers to be admitted. Once admitted, females were excluded from fields of study that were stereotypically "male", such as law (Valentin 1997). Although Title IX applied to all graduate institutions, it had a significant effect specifically on law school admissions. Table 1 lists first-year enrollment numbers in law school. The largest increase in female enrollment is in 1973-1974, one-to-two years after Title IX was passed. More importantly, male growth in enrollment becomes negative after Title IX was passed.

Understanding the impact of Title IX is a timely research project as policymakers are trying to understand the gender gap in certain occupations, most notably in STEM fields (Remarks by the President at College Opportunity Summit 2014). There are many possible explanations; my paper explores the role of gender discrimination in law school admissions and graduate school admissions, more generally. Isolating and quantifying single determinants will help policymakers to better understand the factors that are driving gender inequality in graduate education and, subsequently, in occupations. I also examine whether there are any indirect effects of increasing access to higher education. For example, does increasing female access to law school increases the likelihood that females will continue to practice law? The underlying theory is that as female access to law school increases, so does the opportunity cost of not working in the labor force (assuming that increased access leads to increased degree obtainment). Therefore, one would expect to see an increase in labor force participation in conjunction with an increase in access to legal education.

This research is of national importance as existing gender inequality due to barriers have important welfare implications. A 2013 working paper by Hsieh and coauthors estimates that 15-20 percent of the growth in aggregate output per worker can be explained by the removal of "frictions", generally defined, and the resulting improvement in allocation of talent. Their finding begs further research into the removal of specific frictions, like Title IX, to better understand females' decisions to pursue specific fields and occupations. Moreover, my project will fill a void in the Title IX literature, which currently focuses on the impact of Title IX on athletic outcomes rather than academic outcomes (Stevenson 2010). To my knowledge, this is the first study of its kind that seeks to estimate causal effects of Title IX on gender disparity in law degrees and graduate degrees more broadly.

#### 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?

The theoretical grounding for this research comes mainly from human capital theory and Gary Becker's work on modeling an individual's decision to pursue higher education as an investment in human capital. This framework helps us to understand the role of costs (in this specific case, gender discrimination in admissions) in female degree obtainment.

However, the scarcity of empirical evidence on the effectiveness of Title IX attests to the difficulty of identification. First, Title IX is a national policy, making it hard to find useful variation to estimate a causal impact. Second, the 1972 passage of Title IX corresponded with the women's movement, the introduction of the birth control pill, and the legalization of abortion -- events that can also affect female educational choices. Perhaps for this reason, most of the current work on Title IX look at its impact on high school athletics; Stevenson (2010) finds that Title IX had a significant and positive impact on female college attendance and labor force participation through participation in high school sports. As mentioned before, this research project will fill a void in the Title IX literature by looking at academic outcomes.

The research on the growth in female labor force participation is much more extensive. Much of this literature focuses on the demand factors, specifically the decreasing gender wage gap. Black and Juhn (2000) posit that the increase in female professionals is a female response to the overall increase in skill demand. Indeed, Mulligan and Rubinsten (2008) find that a main factor of the decreasing gender wage gap is the decision of higher-ability females to enter the labor force. Interestingly, Blau and Kahn (2006) find that the slow-down in convergence of female and male wages in the 1990s (compared to the 1980s) was not due to changes in human capital but rather changes in labor force selectivity and in unmeasured gender differences and labor market discrimination. This is in line with the theory posited by Heckman and Sedlacek (1985), which presents a model of self-selection in the labor market that depends on observed and unobserved heterogeneous skills.

Less work has been done on the supply factors with most of them focusing on the fertility consequences of labor force participation. Goldin and Katz (2002) find that the introduction of the birth control pill lowered the cost to women of making long-term career investments. Bailey (2006) follows up on Goldin and Katz's work to examine the effect of the pill on the intensity of female labor force participation (the pill increased the number of hours worked by women). My research differs from previous supply-factor research in that it focuses on graduate field of study (specifically law school), and thereby on the intensive margin of occupational choice rather than the extensive margin of labor force participation.

# 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?

This study seeks to answer the following research questions:

1. What is the impact of Title IX on gender disparity in law school, and more generally, in graduate fields of study?

- 2. Which fields were most affected by Title IX?
- 3. Were there heterogeneous barriers-to-entry by field?
- 4. Did Title IX have an effect on reducing gender disparity across fields? Which fields were females switching away from and into?

5. Are there any indirect effects of Title IX? Does increasing female access to law school also increase the likelihood that females stay in the labor force and practice law? What about for other graduate degrees?

My main research strategy to answer Questions 1 - 4 uses a difference-in-differences methodology (DID). I compare educational outcomes between males and females (first difference), pre- and post-Title IX (second difference). The male-female comparison provides me with a measure of gender inequality. Moreover, I use males as the control group to estimate national trends in graduate education that were occurring concurrently with Title IX. An important assumption of DID methodology is the pre-treatment trends assumption. Specifically, I need to confirm that males are an appropriate control group for females by checking that trends in educational outcomes before the passage of Title IX are similar for both genders. If this assumption holds, my estimate is a plausibly causal estimate of the impact of Title IX on gender inequality in education.

I include in my regression model controls for other factors that influence graduate school decisions: race and ethnicity, age, birth state, graduate school region, and a fourth-order polynomial time trend. Moreover, I exploit the exogenous passage of Title IX, which mitigates my concern for biases arising from the exclusion of unobserved control variables. (The DID method simulates a quasi-natural experiment.)

To strengthen my analysis, I consider alternative explanations for the decrease in gender disparity in graduate education. Title IX came at a time when women's rights were greatly expanding. The birth control pill was introduced in 1960, giving women a lot more freedom in their career choices. The 1964 Civil Rights Act outlawed discrimination in sex as well as race, religion, and national origin. Roe v. Wade, the 1973 Supreme Court case, gave women the right to have an abortion. To complement Title IX, which used sanctions for non-compliance with gender-equity legislation, the Women's Equity Education Act (WEEA) was passed in 1974 and provided incentives and guidance to schools and community groups to achieve gender equality. I control for the events that I am most concerned about: access to the birth control pill and abortion.

Both the birth control pill and abortion access lowered the cost of long-term career investments for women. With greater certainty over the pregnancy consequences of sex, women no longer needed to worry about an unintended pregnancy interrupting their education or career. Similarly, by allowing females to terminate their pregnancies, we would expect Roe v. Wade to increase the number of female graduates. The concern is that because of the timing of these two events (the pill was introduced in 1960 and Roe v. Wade was passed in 1973) and because I am running a DID strategy, females in my post-Title IX cohort will have access to the pill, abortion, and be affected by Title IX, while females in my pre-Title IX cohort will not have access to any of these. Any positive, significant effects in my estimate of Title IX, therefore, would be due to the combined effect of the pill, abortion access, and Title IX. Below, I describe my solutions for dealing with these two potentially confounding events.

Building upon previous research on the birth control pill, I exploit the fact that several states during the late 1960s lowered their age of majority, thereby granting a large set of young females access to the pill (Goldin and Katz 2000; Bailey 2006; Myers 2012, 2014). There are 15 states where single females below age 20 were able to obtain the pill in 1969, before Title IX was passed. By restricting my data sample to these states, I am allowing for all females in my analysis sample to have access to the pill. Now my estimate of Title IX will be the sole effect of Title IX rather than the combined effect of Title IX and the pill.

Abortion was not illegal in all states prior to Roe v. Wade. Rather, states had differing standards for legal abortions. However, abortion statistics, which the Center for Disease Control began tracking in 1969, reveal that women residing in the states with the strictest abortion laws obtained more legal abortions per 1000 live births than women from states with median-level abortion laws (Bourne et. al, 1970). Therefore, I argue that the legalization of abortion is not a worrisome confounder as women in my analysis had access to abortions before Roe v. Wade. However, it is still an important factor in female education decisions, and therefore, I include a measure of abortion access in my DID models. Specifically, I include state-level abortion rates.

To answer Question 5, I first measure convergence using the Earth Mover's Distance Algorithm (EMD), a widely-used metric in computer science to measure the similarity between two distributions. EMD is the appropriate metric for my analysis as it considers gender disparity both within graduate fields and across graduate fields, unlike conventional measures of distributional change in unordered variables (Reardon 2009; Rubner, Tomasi, and Guibas 2000). For my analysis, I employ an instrumental variables approach using the passage of Title IX as the instrument for educational convergence on occupational convergence (dependent variable). If Title IX did indeed increase female graduate degrees, the opportunity cost of not working also increases, suggesting that females are also more likely to work. Therefore, it is possible that Title IX had an indirect effect on female occupational choices.

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#### Summary

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**Project Description - Appendix** 

<u>Table 1 - Law School Enrollment</u>

Datasets

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

Summary

I am using the 1993 National Survey of College Graduates (NSCG) for education data and 1964-2014 Current Population Survey (CPS) for occupation data. Both datasets are publically available.

I use the 1993 NSCG data because it surveyed all non-institutionalized, U.S. individuals under the age of 73 with at least a bachelor's degree as of 1993. One of the challenges of studying the impact of Title IX on academic outcomes is the dearth of large-scale datasets that record detailed education data from the 1960s. The individuals who lived through Title IX would have been roughly 40-50 years old in 1993 and, therefore, in the 1993 NSCG. Most importantly, the 1993 survey is the first of its kind to ask about field of study.

The CPS March Supplement, an annual supplement to the monthly CPS, is jointly collected by the Bureau of Labor Statistics and the Census Bureau. The main CPS uses a probability selected sample of about 60,000 occupied households and surveys non-institutionalized individuals not in the Armed Forces above the age of 15. It is the primary source of labor force statistics for the United States, whereas the March Supplement asks detailed questions on educational attainment, work experience, and specific labor market outcomes over the previous calendar year.

#### 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.

**Timeline and Deliverables** 

#### **Timeline:**

Provide a timeline of key project activities.

I have already downloaded the data, obtained IRB approval (an exempt determination), and started preliminary analysis on this research project. Below is a timeline for the remainder of my dissertation research.

Spring 2016 – Finish data analysis and write up results.

Summer 2016 – Schedule dissertation proposal to committee and propose (generally scheduled the summer before graduation). Fall 2016 – Polish up analysis, subject to committee's comments and suggested revisions. Finalize report and submit to journals for dissemination. Spring 2017 – Defend dissertation.

#### **Deliverables:**

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

Required by Access Group/AIR: Mid-Year Report 2016 Access Group Legal Education Research Symposium Final Report

As mentioned in my Dissertation Timeline above, I will also be submitting my research paper to peer-reviewed academic journals and academic conferences.

#### **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.)

I will disseminate my results by presenting at the Access Group Legal Education Research Symposium Presentation in Chicago. I also intend on submitting my research paper to peer-reviewed academic journals and academic conferences (i.e., Annual Meetings of the American Economic Association, Society of Labor Economists, and Population Association of America).

#### **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.

I have already obtained an exempt determination from the IRB for this research project. My research proposal is exempt from further IRB review under the Federal Regulations (45 CFR 46.101(b)), category (copied-and-pasted from my IRB notification):

Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that

#### Summary

subjects cannot be identified, directly or through identifiers linked to the subjects.

#### **Biographical Sketch(es)**

#### Biographical sketch (limit 750 words):

I am a fifth-year doctoral student at the Harris School of Public Policy at the University of Chicago and a pre-doctoral research fellow at the National Opinion Research Center (NORC). My general research interests are in applied economics, labor economics, and education. Specifically, I am interested in questions that lie at the intersection of gender issues and labor market outcomes. I am con-currently working on two other research projects: the first one seeks to estimate the differential impact of career concerns on fertility by gender. The second is collaborative work with Professors Dan Black and Kerwin Charles at Chicago Harris on the effect of the housing boom on family formation and female labor market outcomes.

My training is very similar to an economics PhD student's but with more emphasis on program evaluation and applied econometrics. As a result, I am well-trained in rigorous quantitative analysis methods and comfortable with cleaning and analyzing large datasets using statistical analysis software packages like Stata, SAS, and R. I have passed all three core exams in Microeconomics, Game Theory, and Econometrics. I took my specialized field exam, Labor Econometrics, in the Department of Economics at the University of Chicago, and passed with distinction.

I also hold a B.A. in economics from Wellesley College and a Master of Public Policy from Chicago Harris. I am fortunate to have had the opportunity to work with several professors on research projects starting from my first year as a master's student at Chicago Harris. These research assistantships were invaluable experiences that honed my analytical skills and shaped my research interest in gender inequality. Nearly all of my research experience is in working with national datasets, such as the Census data, the Current Population Survey, the American Community Survey, and the National Longitudinal Survey of Youth. In terms of sole-authored research, my master's honors thesis on the sibling peer effect on teenage birth won the Irving B. Harris prize for the Most Outstanding Honors Paper in Child and Family Policy. I was also competitively selected and invited to present my research at the 2015 Annual Meeting of the Population Association of America.

Budget

Dissertation Grant Budget

**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.

I have not had any prior, and do not have any current or pending funding for the proposed research. I also have not had any prior funding from AIR.

**Dissertation Advisor Letter of Support** 

There are no files attached.

# Table 1. U.S. Law School First-Year Enrollment by SexAcademic years 1969-70 through 1983-84

|               | First-Year Enrollment |        | Growth Rate |       |      |        |
|---------------|-----------------------|--------|-------------|-------|------|--------|
| Academic Year | Total                 | Male   | Female      | Total | Male | Female |
| 1969-70       | 29,128                | 27,025 | 2,103       |       |      |        |
| 1970-71       | 34,289                | 30,747 | 3,542       | 18%   | 14%  | 68%    |
| 1971-72       | 36,171                | 31,845 | 4,326       | 5%    | 4%   | 22%    |
| 1972-73       | 35,131                | 29,623 | 5,508       | -3%   | -7%  | 27%    |
| 1973-74       | 37,018                | 29,554 | 7,464       | 5%    | 0%   | 36%    |
| 1974-75       | 38,074                | 29,068 | 9,006       | 3%    | -2%  | 21%    |
| 1975-76       | 39,038                | 28,566 | 10,472      | 3%    | -2%  | 16%    |
| 1976-77       | 39,996                | 28,642 | 11,354      | 2%    | 0%   | 8%     |
| 1977-78       | 39,676                | 27,748 | 11,928      | -1%   | -3%  | 5%     |
| 1978-79       | 40,479                | 27,155 | 13,324      | 2%    | -2%  | 12%    |
| 1979-80       | 40,717                | 27,227 | 13,490      | 1%    | 0%   | 1%     |
| 1980-81       | 42,296                | 27,024 | 15,272      | 4%    | -1%  | 13%    |
| 1981-82       | 42,521                | 26,710 | 15,811      | 1%    | -1%  | 4%     |
| 1982-83       | 42,034                | 25,898 | 16,136      | -1%   | -3%  | 2%     |
| 1983-84       | 41,159                | 25,110 | 16,049      | -2%   | -3%  | -1%    |

Source: American Bar Association, Section of Legal Education and Admissions to the Bar, "Enrollment and Degrees Awarded 1963-2012 Academic Years".



# Dissertation Grant Proposal Budget Form



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| Salary/Stipend   | \$       |
|--|----------|
| <b>Travel</b><br>2016 Access Group Legal Education Research Symposium:<br>Other research related travel:<br>( <i>Note</i> : Other planned travel should be listed in the "Timelines and Deliverables" section)   | \$<br>\$ |
| <b>Other research expenses</b><br><i>Please provide a breakdown of expenses below and add the total value in the box to the right.</i><br>Allowable expenses include: materials, such as software, books, supplies, etc.; consultant<br>services, such as transcription, analysis, external researchers, etc.; and costs for publishing<br>articles in journals. The purchase of computer hardware, overhead or indirect costs, and living<br>expenses are not allowable. If you have questions about specific expenditures please contact<br>AIR. | \$       |

TOTAL REQUESTED