Reducing Sex Offenses on Campus: A Regression Analysis of the VAWA Campus Grant

Program in 3 Parts

By

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This paper identifies the systematic differences between post-secondary campuses that do and do not apply for, and do and do not receive funding from the *Grants to Reduce Violent Crimes Against Women on Campus Program*(i.e., a Campus Grant) over a period of five years. In particular, this paper uses regression analysis to estimate which institutions apply for and successfully receive a Campus Grant, as well as the subsequent influence that a Campus Grant has on the number of sex offenses at a given campus. Among other findings, my estimates suggest that large public universities with higher sex offenses, ceteris paribus, are more likely to apply and receive a Campus Grant. In addition, in the first three years of operation, Campus Grants are correlated with a 7.0 to 4.9 reduction in the number of sex offenses.

Acknowledgements

I would like to thank Professor Bruce Blonigen for his exemplary patience and support from the outset and until the end of this long process, and Professor Glen Waddell for his insight and narrowing focus. I would also like to thank Professor Louise Bishop for serving as my CHC representative. Truly, none of this would have been possible without the long-term support and guidance from all of you, and for that I will be eternally grateful.

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I. **Introduction**

The motivation for this study comes from the frightening reality of sexual assault, dating violence, domestic violence, and stalking on campuses across the United States. From the Department of Justice Office of Community Oriented Policing Services *Acquaintance Rape of College Students* (2010):

> Researchers believe that college rape prevention programs, including the most widely used ones, are insufficient. Most rapes are unreported, perhaps giving campus administrators and police the false impression that current efforts are adequate.

Here are some statistics from *The Sexual Victimization of College Women*, 2010 U.S. Department of Justice Research Report. The full report is available online at the National Criminal Justice Reference Service archive.

- "The data suggest that nearly 5 percent (4.9 percent) of college women are victimized in any given calendar year"
- "For every 1,000 women attending their institutions, there may well be 35 incidents of rape in a given academic year"
- "For both completed and attempted rapes, about 9 in 10 offenders were known to the victim"
- "With regard to date rape, 12.8 percent of completed rapes, 35.0 percent of attempted rapes, and 22.9 percent of threatened rapes took place on a date"
- "Almost 60 percent of the completed rapes that occurred on campus took place in the victim's residence"

- "Fewer than 5 percent of completed and attempted rapes were reported to law enforcement officials"

This paper examines the *Grants to Reduce Violent Crimes Against Women on Campus Program* (Campus Grant Program) awarded by the Department of Justice: Office on Violence Against Women (OVW), between 2007 and 2012, in three steps of regression analysis. By doing so, this study aims to answer three questions:

What factors are correlated with schools soliciting the OVW for financial support in service of the Campus Grant Program's goals? This first question seeks to model the institutional and geographic differences between those campuses in the United States that apply for Violence Against Women Act (VAWA) grant funding and those that do not. The resulting model does not separate out those schools that received grants from those that did not.

Of those campuses that applied for a grant over the given time period, what characteristics and institutional statistics predict award recipients? The second model takes the analysis of the first question and runs the same regression. However, observations are limited to only those that at least applied for a Campus Grant, with the left-hand-side of the equation being the endogenous dummy variable of whether or not the given campus received a grant. This model is meant to separate out the statistical differences between these two groups of campuses.

If a given campus applies for or successfully receives a Campus Grant, how does that influence their annual Sex Offense rate as recorded by Clery Act reports? This last model is the ultimate focus of this study. Based on the results of the first two models,

which give some understanding of which campuses receive grants, this model

examines how annual *Jeanne Clery Disclosure of Campus Security Policy and Campus*

Crime Statistics Act (Clery Act) reports of forcible sex offenses change at each campus

in relation to the presence of a Campus Grant.

The Violence Against Women Act (VAWA) was signed into law in 1994 as part of

the Violent Crime Control and Law Enforcement Act of the same year. Since then, the

Office on Violence Against Women has become a permanent part of the Department of

Justice. The Office's main purpose is "to implement (VAWA) and subsequent legislation"

and supplies communities, institutions, non-profits, and other organizations around

the country with assistance in their efforts to end domestic violence, dating violence,

sexual assault, and stalking (The Office on Violence Against Women).

The *Grants to Reduce Domestic Violence, Dating Violence, Sexual Assault, and*

Stalking on Campus Program is 1 of 18 discretionary grant programs maintained by the

OVW. The goal of the program is to reduce domestic violence, dating violence, sexual

assault, and stalking through the funding of victim services and programs (The Office

on Violence Against Women). An institution may apply for the grant to use in one of a

variety of ways, including the funding of faculty positions, educational courses, and

victim services.

Every solicitation to the Campus Grant Program is examined by OVW staff and

peer reviewed (The Office on Violence Against Women: Peer Review Guidelines) by

"panels comprised of campus-based experts, including campus law enforcement

officers, victim advocates, faculty, researchers, and administrators with Violence

Against Women Act (VAWA) grant program expertise" (Report to Congress on the 2010 Activities of Grantees Receiving Federal Funds Under the Grants to Reduce Violent Crimes Against Women on Campus Program). To prevent direct bias, external peer reviewers are not allowed to serve on panels for applications towards which they might have a conflict of interest. The solicitations are scored by the panels on a variety of bases, and the final decision is made by the OVW Director.

Since the overall purpose of the Campus Grant Program is to reduce sexual assault, dating violence, domestic violence, and stalking on post-secondary campuses across the nation, this study examines the influence these grants have in reducing these statistics. Data from the Clery Act's on-campus section describing "Sex Offenses – Forcible" is used to represent these together. Dating violence, domestic violence and stalking are not recorded or reported in sufficient form to run through regression models, so number of sex offenses is used as a proxy for the group. This study does not analyze the decision-making process of the peer review panels, and also does not analyze the content of the solicitation itself. Instead, annual Clery Act On-Campus Criminal Offense, enrollment, and campus attribute data for each solicitation is used to describe the situation of a given campus for the time the solicitation would have been written, rather than examining the funding scheme of an application summary.

For a discussion on the limitations of this study, including both included and excluded points of interest, please see Section IX.

II. Similar Studies

This study seeks to break down just one of the many grant programs, and in doing so I acknowledge that I have had to make certain assumptions; ignoring any cohabitation with other grants and the average effectiveness of the Campus Grant to name just two of them. Unfortunately, there has been little on this topic to guide my research. There is a marked lack of research into the efficacy of VAWA programs, likely due in part to the wide variance of focus and scope of said programs. The range of possible research questions addressing VAWA programs is vast, but the availability of data and level of relatedness of said data is the real problem. As is discussed later on, I have been forced to make several specifications and assumptions of my data that I am sure some would disagree with, but these decisions were based on what was available, combined with my best logic.

As for past precedence, *Violence Against Women Act (VAWA) Funding: A Nationwide Assessment of Effects on Rape and Assault* (2009), by Rachel Boba and David Lilley, essentially sums up all related work. The study, published in the monthly journal *Violence Against Women* in February of 2009, examines violent crime rates throughout the United States between 1996 and 2002. The paper attempts to capture the effects of applied grants on the crime rates, instead of the previously used method of evaluating the change in "the quality and availability of services for female victims of violence."

Boba and Lilley's method is to examine reductions in crime rates for seven Uniform Crime Reporting (UCR) Part I crimes. Two of these, Rape and Aggravated Assault, are expected to be correlated with VAWA grant intervention. If a reduction in all crime rates seems to occur instead of just with the listed two, the test would indicate a coincidental relationship with the presence of a VAWA grant.

The results of the panel regressions were encouraging. VAWA funding was positively correlated with a decrease in crime rates for both Rape and Aggravated Assault, but not the other crime statistics used as regressors. This supported the hypothesis that VAWA funding had the intended effect in reducing violence toward women in line with the goals of the grants. "A 1% increase in VAWA funding was associated with a 0.066% reduction in rape and a 0.080% reduction in aggravated assault."

If the results of this study are anything to go on, they certainly predict that VAWA grants should have positive effects in reduction sexual assault, dating violence and stalking on college campuses. My study uses a narrower basis with which to examine VAWA funding, but the trends should be comparable.

III. Methodology and Data Sources

To define the boundaries of this study, I wrote a Freedom of Information Act request to the Department of Justice: Office on Violence Against Women. The data I received detailed both unfulfilled solicitations and awards between the years of 2008 and 2012. Included were records of Campus Grant awards going back to 1999, but these only listed successful applicants and were useless for any regression. The OVW only keeps data on unsuccessful grant solicitations for a limited time, thereby circumscribing the effective time period of data I could work with.

From there, I collected Clery data on forcible sex offenses from the Department of Education: Office of Postsecondary Education, covering the years of 2007-2011. This dataset included all postsecondary institutions organized by campus, which is why the combined datasets later had to be differentiated by campus. Some few hundred of these observations were unique to a year or several years, and had to be dropped to give a grouping of campuses that were consistent across the full five-year period. Data from my FOIA request was then added on to this, with several exceptions where the school in question could not be identified based on the information available. I also generated a new variable, *InGrant*, which I used to show whether a given school had an ongoing Campus Grant in effect for a given year.

The ID codes for each school were then entered into the Integrated Postsecondary Education Data System (IPEDS) to collect enrollment, full-time retention

rate, the existence of campus residence, and school control data for the years 2007-

2012. The female percentage of enrollment was also derived from this data.

In STATA, the data from these two datasets were combined by creating a unique

code for each campus and year and using the merge command to match campuses

across datasets. 215 observations, of the resulting 37124, were dropped from lack of

match. No information was available for these campuses on either dataset.

At this point, I had all the variables ready to run both the first and second

regressions. For a full walkthrough of my process, see the *Regression Analysis* section

describing these models.

For the third regression, I ran a preliminary version of the regression that did

not include dummy variables for which year of effect a grant was in. This resulted in a

large, positive β value for the *InGrant* variable. Now, it did not make much sense that

the Campus Grant had an inferred effect of *increasing* sex offenses. The direction of

correlation was more likely the opposite that schools with high sexual assault numbers

sought out the grant. To parse out this obvious problem of reverse causality, I added

dummy variables which represented the given year of effect an ongoing campus grant

was in. These took the form of *Year0* through *Year7*. *Year0* echoed the fact that

Campus Grants are awarded late in the calendar year, usually September. Therefore,

the first full calendar year that a grant was in effect became the variable *Year1*.

For example, if campus *s* has an ongoing grant in year *t*, their *InGrant* variable

for that year reflects a value of 1. Now, if that grant was awarded to the campus in

September the year before (t − 1), that campus's *Year1* variable would have a value of 1.

This continues down the line such that, for every campus that has a grant in at least one of the observed years, one of the *YearX* variables reflects how old the grant is. These variables show a more accurate measure of the effect an ongoing grant has on sex offenses, and displays how different the *Year1* grant effect is from the *Year4*.

From the Department of Justice: Office on Violence Against Women, I received records of the *Grants to Reduce Violent Crimes Against Women on Campus Program* in response to my earlier FOIA request. This data included successful grants awarded from 1999 to 2012. However, data on all solicitations, successful and not, were only available from 2008 to 2012.

From the Department of Education: Office of Postsecondary Education (OPE), I utilized *The Campus Safety and Security Data Analysis Cutting Tool* to gather "Sex Offenses – Forcible" data on all postsecondary campuses across the United States. This data is organized by campus, which necessitated the differentiation between separate campuses of the same institution. It is possible this specification created a downward bias in how much influence a given grant had at an institution. It is also possible that there was some double counting due to the separation. However, these problems were unavoidable, as determining the degree of campus separation was beyond the realm of this study.

From the Integrated Postsecondary Education Data System (IPEDS), I gathered data describing the control system, on-campus residence situation, full-time retention rate, and enrollment information of every university specified by the OPE data. Control systems were described as one of three categories: public, private not-for-profit, and

private for-profit. The data for on-campus housing was turned into a yes/no dummy

indicator. The enrollment data I gathered gave total and female enrollment figures,

from which I generated a new variable that gave female percentage. The full-time

retention rate data was important, as I used it as a rough proxy for the quality of

services provided to help students succeed. There were other measures of student

service quality, but none easily applied to my entire dataset.

IV. Preliminary Findings

This section provides some descriptive analysis of the raw data before turning to regression modeling, in order to give the reader a sense of general trends occurring over the five year time period. In addition, this section draws attention to some of the essential differences between grant non-soliciting, grant soliciting, and grant receiving campuses.

It is important to understand the scale of solicitations over the 5-year period. Figure 1 below illustrates the wide variance in number of solicitations by year. As can be seen, 2008 found a relatively high number of applications, while the following year had little over half as many.

Number of Campus Grant Program Solicitations
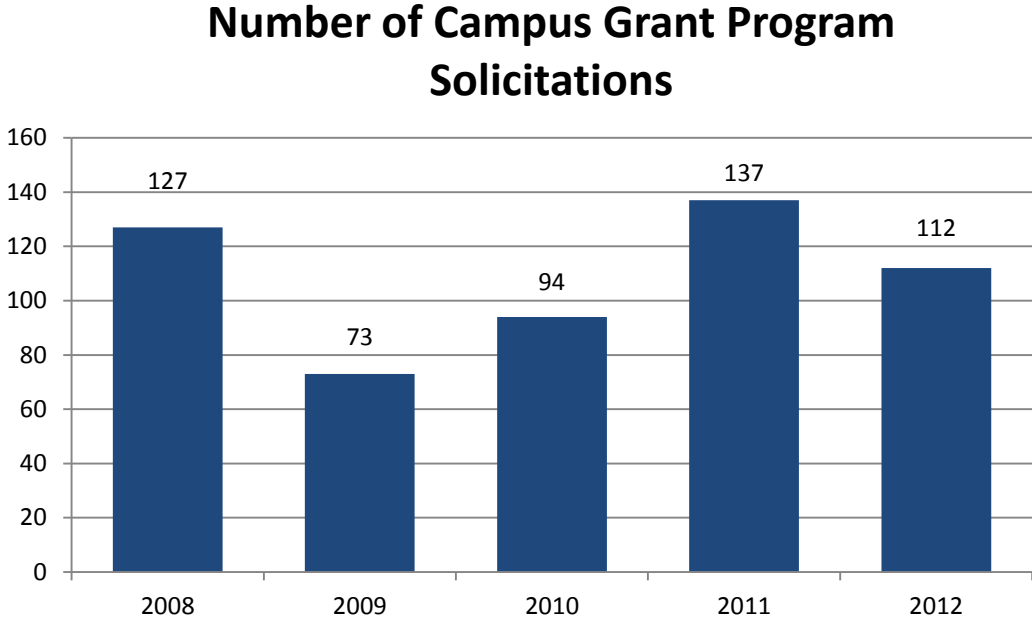
Figure 1: This graph outlines the number of solicitations for the Campus Grant Program by year.

Figure 2 below shows grant award totals by year, as tallied from the *Solicitation Application Summary 1999-2012*. The graph reveals a trend almost inverse that of the number of applications, with an obvious decline in award totals after 2009.

Campus Grant Award Totals per Year
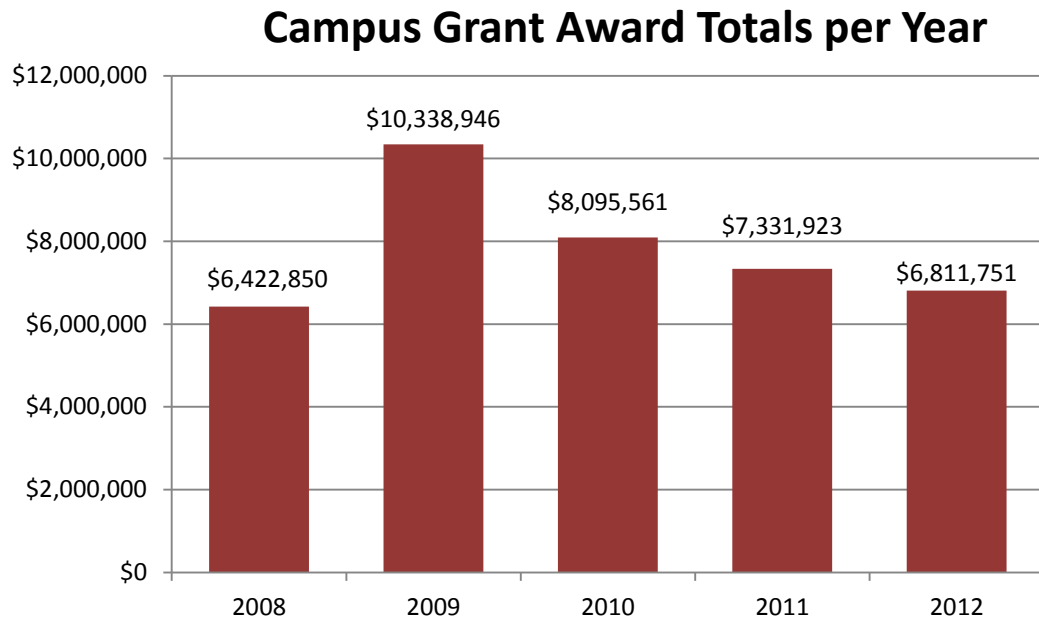
Figure 2: This table outlines the total amount of funds used to fulfill Campus Grants for each of the five years.

The following graphs examine the specific differences between campuses with active grants and campuses without them. These results are simple averages of the separate groups. It should be noted that data for the statistics used in these comparisons is only available up to 2011, while data separating campuses into those with and without grants is only available from 2008 to 2012. This limits the explanatory power of any trend drawn from the following graphs to just the 4 years shown below.

The first graph, Figure 3, displays the average enrollment sizes of the two groups by year. The comparisons show an obvious skew of grant awards toward campuses with relatively higher enrollment sizes, with grant-receiving schools at least 3 times larger in terms of average enrollment.

Over the 4-year period, the average enrollment size of grant-receiving campuses decreases almost consistently, while the average of all other schools rises over the same period.

Average Enrollment Sizes
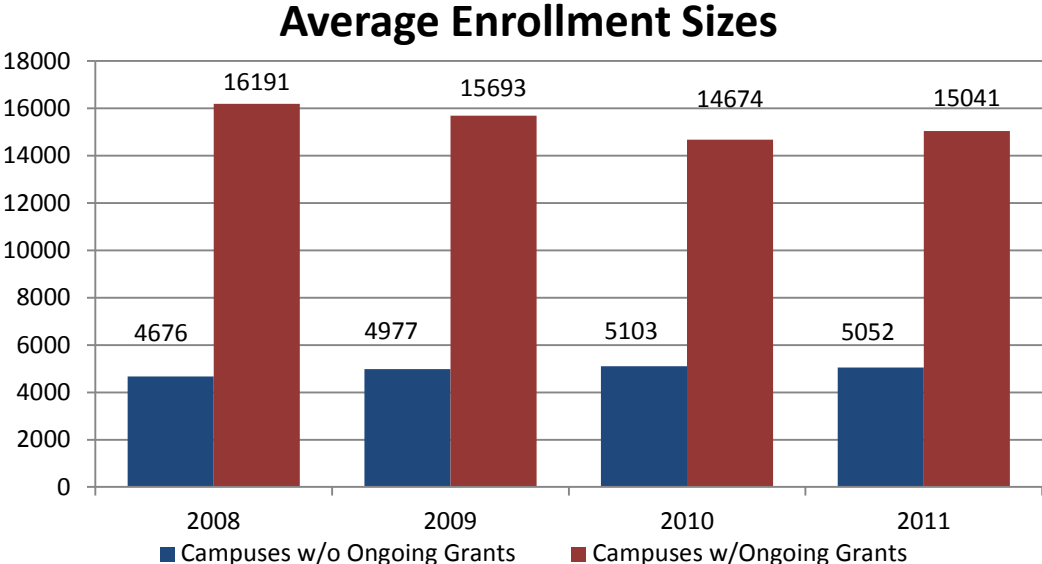
Figure 3: This graph displays average enrollment sizes by year for two separate groups. Campuses with an active Campus Grant in the given year make up the red bar, and campuses without an active Campus Grant in the given year make up the blue bar.

This graph does not control for the number of campuses captured that may be too small to receive a campus grant. However, with no benchmark to determine whether or not a school is too small to receive a grant, no other way of dividing the

groups is available. It is possible that this biases down the average for schools without an active grant.

Figure 4 demonstrates the difference between grant-receiving and grant non-receiving campuses in terms of their average full-time retention rate. The full-time retention rate is the percentage of full-time students from the previous year that are returning to school. The measure is one of two commonly used to roughly judge the happiness of students and/or the quality of student services available (the second being graduation rates). In this study, the full-time retention rate is used as a rough proxy for a campus's quality of available student services.

From the graph below, it is apparent that campuses with ongoing Campus Grants have, on average, a higher full-time retention rate than campuses without. Please note that this graph takes data from full-time retention rates and ongoing grants of the same year, and makes no attempt to infer direction of causality. It is possible that some portion of the full-time retention rate is explained by the presence of a Campus grant, for those campuses that make up the red bars.

Average Full Time Retention Rate
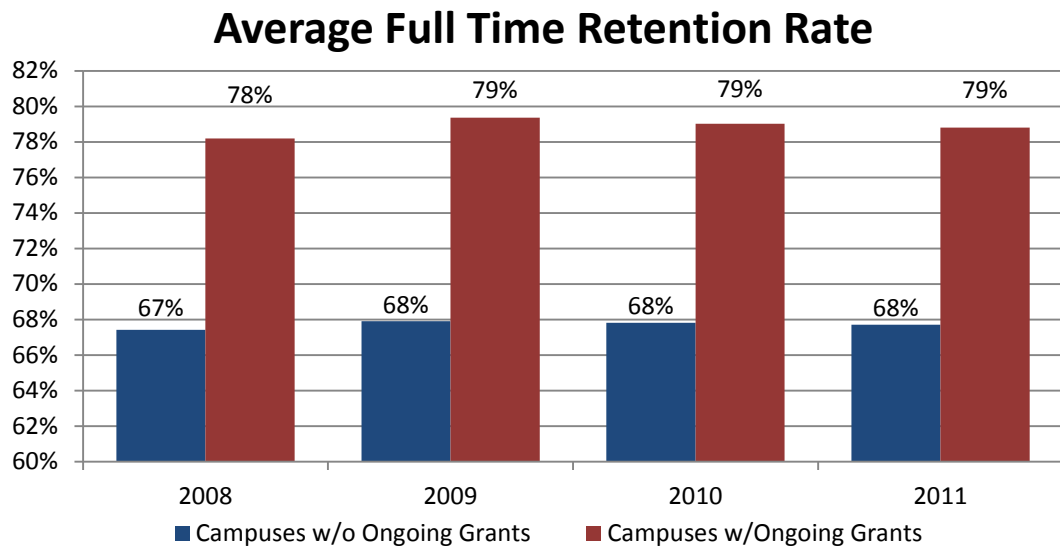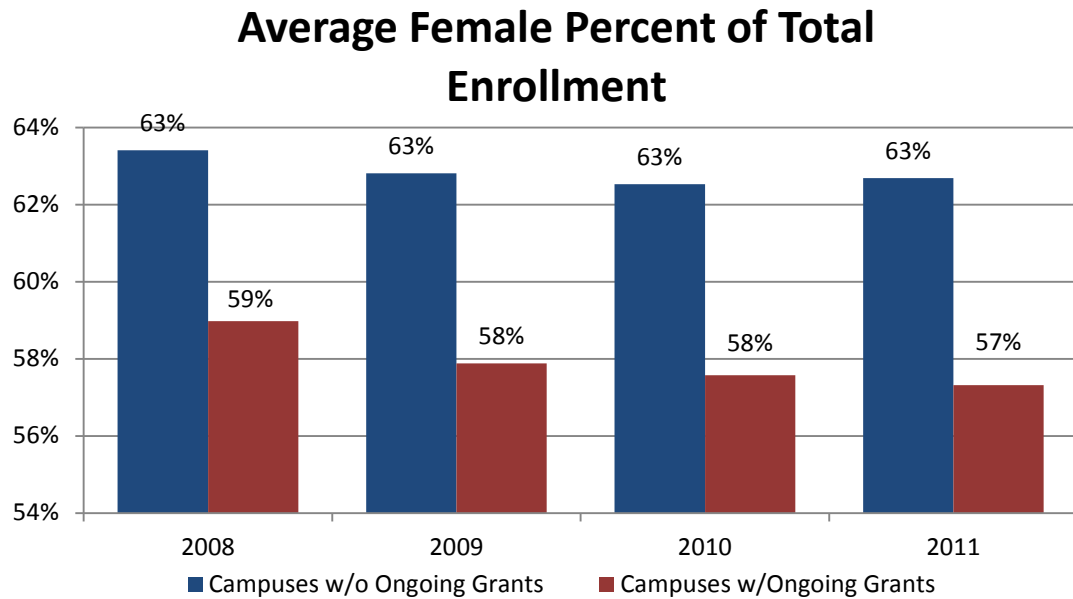

Figure 4: This graph displays average full-time retention percentages by year for two separate groups. Campuses with an active Campus Grant in the given year make up the red bar, and campuses without an active Campus Grant in the given year make up the blue bar.

The next graph compares the average female percent of total enrollment of the two groups. Here, we see that campuses with Campus grants have, on average, a lower percentage of female students than those without. Even in 2011, the difference is only about 6 percent. However, it is interesting since the average doesn't change across campuses without grants, and that it declines slightly over the years for those with Campus Grants.

According to reports from the Bureau of Justice Statistics, "In 2010, the male rate of rape or sexual assault was 0.1 per 1000 males compared to a rate of 2.1 per

1000 females."[1] Based on this, and understanding that the Clery Act data on sexual assaults comes from on-campus reports, a more even distribution of males to females on campus could explain why we see that the averages for campuses with a grant are lower than those without.

Average Female Percent of Total Enrollment

Figure 5: This graph displays average female percent of total enrollments by year for two separate groups. Campuses with an active Campus Grant in the given year make up the red bar, and campuses without an active Campus Grant in the given year make up the blue bar.

[1] Langton, Lynn and Michael Planty, 2013. Female Victims of Sexual Violence, 1994-2010. *Bureau of Justice Statistics.*

V. Regression Analysis and Specifications

Statistical regression analysis estimates the relationships between a set of variables, called regressors or independent variables, on a focus variable, often termed the dependent variable. The regression analysis estimates coefficients attached to each of the independent variables that indicates how the dependent variable would change if one of the independent variables changes with the others held constant. For example, say I have some regression function with *y* as the dependent variable and *x* as the independent variable. If I have a series of data observations showing different values of *y* with related values of *x,* and the regression returned a coefficient value of 5 for *x,* then that indicates that if *x* were to increase by 1 unit, the value of *y* would increase by 5.

In this analysis, I performed three least-squares, multi-variable, linear regressions. The first examines the independent variables that are associated with a campus applying for a Violence Against Women Act (VAWA) grant. Mathematically, we can express the estimated regression equation as:

$$\text{Applied}_{st+1} = \beta_0 + \beta_1 \text{Pub}_{st} + \beta_2 \text{Priv\_nProf}_{st} + \beta_3 \text{Res}_{st} + \beta_4 \text{PercentFem}_{st} +$$
$$\beta_5 \text{IntSize}_{st} + \beta_6 \text{FRetRate}_{st} + \beta_7 \text{SexOffenses}_{st} + \epsilon_{st}$$

Of note, the dependent variable (which takes the value of "1" when the campus applies for a VAWA grant and "0" otherwise) is observed one year later than the independent variables (*Applied* is in year t+1, not year t). This is used to mitigate issues of reverse causality in the model. If the regressors of this model are all measured in the

year before the campus either applies or doesn't, then the direction of correlation is clear. The sample in this regression is all campuses in the United States for which all necessary data are available.

Pub   This regressor is a dummy variable that takes the value of "1" when the campus in question is a public institution and "0" otherwise. It is perhaps more likely that this variable will have a positive relationship to grant solicitation, as a public campus should be under more public scrutiny and thus be more likely to apply for a federal grant.

Priv_nProf   This regressor is a dummy variable that takes the value of "1" when the campus in question is a private not-for-profit institution and "0" otherwise. I expect a slightly negative coefficient due to a lower amount of public scrutiny, compared with public campuses, around the number of sexual assaults. These last two variables are part of a trio of specifications that come from IPEDS. Each post-secondary campus is categorized as public, private not-for-profit, or private for-profit, based on the control scheme of the institution. The presence of the two above dummy variables is intended to capture this difference.

Res   This regressor is a dummy variable that takes the value of "1" when the campus in question provides optional on-campus housing facilities options for students. I expect **Res** to be a highly positive predictor of Campus Grant application, as campuses with residences should have a high number of sexual assaults on campuses and therefore reported by Clery. Given that Clery Act data on sexual assaults

is for on-campus reporting, it is important to distinguish those campuses that offer on-campus housing from those that do not.

PercentFem   This regressor is derived by dividing the total student enrollment by the total female student enrollment. For this regression, I predict a positive coefficient for this variable, as a larger female enrollment might mean a proportionately greater awareness of sexual violence problems on campus and resulting greater likelihood of application for a Campus Grant.

IntSize   This independent variable necessarily addresses the effect of a campus's size on the dependent. In the first regression, I predict a positive relationship between institution size and the decision to solicit for a Campus Grant. Based on the earlier graphs depicting the higher levels of average enrollment that grant-receiving campuses had, and using logic to consider that the OVW would likely fund higher-populated campuses to target more students, the relative size of each campus must be important to the grant award process and predicting levels of sex offense. Figure 3, above, shows that campuses with grants have much higher enrollment levels, on average.

FRetRate   This regressor represents the full-time retention rate of a given campus, which is the percentage of first time, first-year students that return for a second year. While this measure is clearly biased against schools and professional focuses with high dropout and turnover rates, it is commonly used as a proxy measure for the quality of student services. This follows the logic that the higher the student services, the more likely students will be to return for another year. Likewise, as the

quality of student services varies across campuses, I expect the dependent variables for all three models to change as well. As was observed in Figure 4, campuses with grants had, on average, higher full-time retention rates. For the first regression model, I expect higher enrollments to be positively correlated with applying for Campus Grants.

SexOffenses   The coefficient on this variable displays the correlation between the number of Clery Act reported sex offenses for a given campus with decisions to apply for the Campus Grant. Clery Act data is organized by campus, which is why every other specification had to be in this same format. It would have been simpler and perhaps more concise to have each institution be its own observation for a given year, but this was not possible with the data. For the *SexOffenses* variable, I expect that campuses with higher number of sex offenses would be more inclined to apply for Campus Grants, so the coefficient should be positive.

In the second regression, I examine the campuses that apply for a VAWA grant and explore the factors that determine whether a campus is successful in receiving the grant. Please note that the dependent variable *InGrant* is in the year t+1 to guarantee the direction of correlation.

$$InGrant_{st+1} = \beta_0 + \beta_1 Pub_{st} + \beta_2 Priv\_nProf_{st} + \beta_3 Res_{st} + \beta_4 PercentFem_{st} +$$
$$\beta_5 IntSize_{st} + \beta_6 FRetRate_{st} + \beta_7 SexOffenses_{st} + \epsilon_{st}$$

Pub   In the second regression, because I expect public campuses to be overrepresented, I also expect there to be a positive relationship between this variable and grants awarded.

Priv_nProf   In terms of variables predicting grant awards, *Priv_nProf*

should also have a positive coefficient. However, with the smaller dataset of the

second model, it is difficult to say how strong institution type is in predicting grant

awards.

Res   For this regression, I predict that the presence of residence

options for students will be positively correlated with the campus being awarded a

Campus Grant. The presence of residence options is likely related with relatively more

on-campus sexual assault reports, and I expect VAWA grants to target campuses with

demonstrated need.

PercentFem   I expect the coefficient of this independent variable to be

negative in relation to successfully receiving a campus grant. Figure 5 shows that

campuses with grants have about 5% less female enrollment than the average of those

without grants. This is pre-regression and it is difficult to say what exactly this captures,

but the relationship seems to be slightly negative.

IntSize   For much the same reason as the first regression, I expect

the relative size of the campus to be positively correlated with receiving a campus

grant. A larger campus might have a proportionately larger number of sex offenses

where the funding from a Campus Grant would affect the most people.

FRetRate   Since this regressor used as a proxy for the quality of student

services, I predict a positive coefficient. I believe a grant award would be more likely to

be given to a campus that demonstrates a capacity for its effective use. Therefore, a

higher full-time retention rate would be correlated with a higher likelihood of being awarded a Campus Grant.

SexOffenses   Similar to the first regression, I expect a greater number of sex offenses to be positively correlated with the presence of a grant in the following year. The grant decision process likely targets campuses with larger demonstrated numbers of sex offenses so that the awarded funding will have the greatest positive impact.

Finally, in a third regression I explore whether grants are effective in reducing sex offenses:

$$\text{SexOffenses}_{st} =$$

$$\beta_0 + \beta_1 \text{Pub}_{st} + \beta_2 \text{Priv\_nProf}_{st} + \beta_3 \text{Res}_{st} +$$

$$\beta_4 \text{PercentFem}_{st} + \beta_5 \text{IntSize}_{st} + \beta_6 \text{FRetRate}_{st} +$$

$$\beta_7 \text{InGrant}_{st} + \beta_8 \text{Applied}_{st} + \beta_9 \text{Grant Year0}_{st} +$$

$$\beta_{10} \text{Grant Year1}_{st} + \beta_{11} \text{Grant Year2}_{st} + \beta_{12} \text{Grant Year3}_{st} +$$

$$\beta_{13} \text{Grant Year4}_{st} + \beta_{14} \text{Grant Year5}_{st} + \beta_{15} \text{Grant Year6}_{st} +$$

$$\beta_{16} \text{Grant Year7}_{st} + \epsilon_{st}$$

Pub   In this third regression, the effect being a public campus has on the number of sex offenses is difficult to predict. Neither this nor the following **Priv_nProf** were focuses of pre-regression modeling. However, my expectation is that public campuses will have, on average, more reported sex offenses than private campuses due to higher public awareness.

Priv_nProf   Largely the opposite from **Pub**, I predict that **Priv_nProf** will have a negative coefficient due to lower public scrutiny.

Res   Even more than the previous two models, **Res** should have a highly positive coefficient. Since the Clery Act data on the number of sex offenses is an on-campus measure, it is likely that this dummy variable will have a large positive impact on the dependent.

PercentFem   For this regressor, I expect a negative coefficient. As the proportion of female enrollment increases above 50%, I expect the number of sexual assaults would decrease. This is based on statistics from the 2003 National Crime Victimization Survey, which found that 9 out of 10 sex offenses are identified as a male perpetrator on a female survivor. With proportionately fewer male identified students on a given campus, the number of perpetrators and therefore sex offenses would likely fall.

IntSize   Based on proportionality, I expect the enrollment size of a campus to have a positive coefficient in predicting the number of sex offenses.

FRetRate   For the full-time retention rate, this proxy for the quality of student services should be negatively related to the number of sex offenses. With better student services, we would hope that perpetration of sex offenses would be less.

Applied   This was the dependent variable in the first regression, but now its correlation with sex offenses is examined in the opposite direction, for which I expect a positive coefficient. In the first regression, the question was to what extent the number of sex offenses on campuses explained Campus Grant applications in the

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following year. Now, the inclusion of this independent variable asks to what extent having applied for the Campus Grant explain sex offense numbers.

InGrant   In this regression, this dependent variable is used in conjunction with the variables following to parse out the connection between an active campus grant and the number of sex offenses on a given campus. I expect the coefficient of this variable to be confusing, because it will capture two conflicting influences. It could be negative, displaying the reducing effect of the Campus Grant on the number of sex offenses; but it could also be positive, perhaps indicating a bias towards relatively higher number of sex offenses on those campuses with grants.

Grant YearX   Here, *Grant YearX* actually refers to eight separate variables where *X* takes the values 0 to 7. For a given campus *s* and year *t*, the dummy variable *Grant Year2* (for example) would have a value of 1 if that campus had an active Campus Grant and that grant was in its second year of functioning, and a 0 otherwise. This purpose of this variable is twofold: first, to combat the reverse causality of the *InGrant* variable in the third regression, and second, it is to capture whether or not a grant varies in effect strength during its duration. I expect these variables to have negative coefficients, with decreasing strengths the farther away from *Grant Year0*.

VI. Results

Since both the first and second models use dummy variables for the left-hand-side, endogenous variable (meaning they can only take values of 0 or 1), coefficients on the independent variables can be interpreted as the increase in the probability that the dependent variable takes the value of "1" for a given one-unit change in the independent variable.

While the third model, with its examination of Campus Grant results, is the primary focus of this research, because of the non-random assignment of VAWA Campus Grants, it is not possible to say with confidence that my results have the authority of cause and effect.

In all three regression models, the coefficient on every independent variable is statistically significant at standard confidence levels. Essentially, this means that every variable had some observed and justified influence on the left-hand-side variable for each given model.

First Regression

The first model examines the characteristics that are correlated with a campus applying for a Campus Grant. In the first model, *Pub* and *Priv_nProf* have about the same magnitude of influence. *Pub* is positively correlated with applying for a grant, while *Priv_nProf* is negatively correlated. This indicates that public campuses are more likely to apply, while private ones are less likely to. Some reasoning for this might be that private campuses handle more of their own affairs and are under less public

scrutiny; therefore, they are less likely to apply for a grant that could signal an issue with their campus's security.

Of the seven independent variables used in this model, whether or not a campus provides on-campus housing options seems to be the strongest predictor of soliciting for a Campus Grant. The coefficient of the variable *Res* returned positive, which implies that having an on-campus student population has an impact on application. This might be from greater awareness of a problem, the difference between campus and school police responses, and/or

First Regression Results

	Applied_{st+1}	Standard Error
Pub	0.00840	(0.00098)
Priv_nProf	-0.00743	(0.00180)
Res	0.01977	(0.00188)
PercentFem	0.00645	(0.00151)
IntSize	2.78e-7	(9.75e-8)
FRetRate	0.00011	(0.00002)
SexOffenses	0.01031	(0.00125)
Observations (n)	37124	
Goodness of Fit (R^2)	0.04	

Figure 6: This table displays the coefficients and standard errors of the first regression model.

PercentFem has a positive relationship with the dependent variable, implying that a larger female proportion of total enrollment is correlated with a campus sending in a solicitation. One possibility is that campuses with relatively larger female enrollments also have higher awareness of the realities of sexual violence, thus leading to more proactive solutions.

IntSize has the weakest relationship to the dependent variable in the first regression, most likely due to the high amount of variance between the many observations. However, the positive nature of the coefficient indicates that larger enrollment sizes are correlated with campuses making grant solicitations. This makes sense, as campuses with larger numbers of students might have proportionately larger sex offense problems.

In the first model, the positive coefficient of *FRetRate* indicates that a higher full-time retention rate is correlated with campuses applying for a Campus Grant. This could mean that campuses more likely to keep students will apply for the grant. Alternatively, this variable might also be capturing some influence of systematically better student services that increases both the likelihood of applying for and receiving grants and also the full-time retention rate.

For the *SexOffenses* variable, the result is a positive coefficient that predicts grant applications. This supports the idea that grant dispersal among campuses is, to some degree, influenced by the number of sex offenses present. In the first model, *SexOffenses* has the second strongest relationship that explains grant solicitation; right after *Res.*

Second Regression

The second model estimates which attributes are correlated with a campus successfully receiving a Campus Grant. The *Pub* relationship is the same in the second model as in the first, although stronger. However, *Priv_nProf* has to be omitted due to multicollinearity problems. This is due to fewer observations in the second model, because the sample includes only those campuses that applied for a Campus Grant. What is important is that the coefficient of *Pub* shows a positive relationship to campuses being awarded funding.

In the second model, *Res* is no longer the strongest predictor, but it is still positive and strongly predicts if campuses will be awarded a grant.

PercentFem is the largest positive predictor of a successful award at three times more influential than either *Pub* or *Res*; the next strongest. With this smaller group of observations, it seems that a larger female enrollment is a much more important indicator that a campus will receive a Campus Grant. This is interesting, as it strongly contradicts my expectations. The subset of schools that applied for Campus Grants is likely quite different in makeup compared to the average of all post-secondary campuses. It could be that my earlier table, which shows that schools with grants have a relatively lower percent female enrollment, was biased upward for campuses without grants.

IntSize is again the weakest predictor. The coefficient is still positive, but, by comparison, *PercentFem* is 100,000 times more important an indicator. Again, the smaller sample of observations is expected to bias the coefficient. However, since

schools that receive grants have, on average, higher enrollment sizes, we might have expected the relationship to be larger.

In the second model, the full-time retention rate is one of the smaller coefficients. Its relationship to receiving a grant is positive, suggesting that higher rates are correlated with receiving a Campus Grant.

Second Regression Results

	InGrant$_{st+1}$	Standard Error
Pub	0.14458	(0.05111)
Priv_nProf	n/a	n/a
Res	0.14943	(0.05675)
PercentFem	0.45830	(0.20249)
IntSize	1.26e-7	(2.60e-6)
FRetRate	0.00383	(0.00193)
SexOffenses	0.01259	(0.00525)
Observations (n)	462	
Goodness of Fit (R^2)	0.07	

Figure 7: This table displays the coefficients and standard errors of the second regression model.

For *SexOffenses,* I expected the relationship to the dependent variable would be higher. The relationship is positive, which makes sense as more sex offenses should signal both a problem and also greater awareness of said problem. On the other hand,

all of the observations in this model were campuses that selected into the group that solicited the OVW for a Campus Grant. All of these campuses should have a higher awareness of their sex offenses. If anything, I would expect this relationship to be bias upwards for this model, and it still might be. However, it is interesting that *PercentFem* is far more important, and it makes me question if *PercentFem* is capturing more than just the percentage of females at a given campus.

Third Regression

The third model is interesting for *Pub* and *Priv_nProf*, because they are both negative, with *Priv_nProf* larger than *Pub*. The negative relationship indicates that the control scheme of a given campus is important in determining the number of sex offenses, as both seem to influence the number down. This could be interpreted as *Priv_nProf* have fewer sex offenses than *Pub,* but it might instead be that private not-for-profit schools are under less scrutiny and tend to report fewer occurances. Regardless, my results suggest that the influence of the *Priv_nProf* variable is over 10 times stronger in this regard than *Pub*.

The *Res* variable is a stronger positive coefficient in the third model. This dummy variables suggests that providing on-campus residence is correlated with 0.73 more sex offenses. Now, this does not necessarily mean that on-campus residences cause sex offenses. Recall that the number of sex offenses in each observation are a reflection of only on-campus reporting. It makes logical sense that the presence of a residence area would bias the relationship upwards. This model cannot comment on

whether or not a given sex offense occurred on-campus because of the existence of on-campus housing.

The *PercentFem* variable has a negative coefficient representing its estimated effect on the number of sex offenses. The coefficient implies that for each percent increase in the female percent of total enrollment of a given campus, the number of sex offenses would go down 0.11. This might be explained by the high rates of sex offenses where a female-identified person is the survivor, and where the perpetrator is male-identified. As the female percent of enrollment increases, we then might expect the number of sex offenses to decline with the percent of male-identified people. Again, because my data only captures on-campus reporting, it is impossible to know whether sex offenses would still occur, albeit off-campus and likely in the jurisdiction of the local police.

Once again, total enrollment is the weakest predictor of the dependent variable. The positive nature of the coefficient does suggest a proportional increase in sex offenses with larger student bodies. However, in this measure, an increase of almost 10000 students would be needed to infer an integer change in the number of sex offenses at a given campus.

The full-time retention rate is positively correlated with higher sex offenses in the third model. This could be the result of multicollinearity between four-year-program focused campuses that have relatively higher retention rates and also possess residence halls. It could also be that these same campuses have more students, and therefore spend proportionately more on student services for the larger enrollment.

Third Regression Results

	SexOffenses$_{st}$	Standard Error
Pub	-0.01480	(0.01993)
Priv_nProf	-0.21670	(0.02388)
Res	0.72808	(0.02388)
PercentFem	-0.11110	(0.03812)
IntSize	0.00003	(9.66e-7)
FRetRate	0.01082	(0.00043)
Applied	1.40252	(0.08322)
InGrant	7.55570	(0.52179)
Year0	-6.97776	(0.52739)
Year1	-5.47721	(0.54273)
Year2	-4.93183	(0.54629)
Year3	-5.61260	(0.54383)
Year4	-1.03745	(0.55789)
Year5	-1.42981	(0.63099)
Year6	-0.01117	(0.75298)
Year7	0.89850	(0.70479)
Observations (n)	37124	
Goodness of Fit (R^2)	0.18	

Figure 8: This table displays coefficients and standard errors for the third

regression model.

Whichever it is, the influence of this variable is not high. A ten percent increase

in given campus's full-time retention rate predicts 0.1 more sex offenses. This could

mean that student services is not a good predictor of the number of sex offenses at a

given campus, but I believe it is more likely that the variable is just a little too rough of a proxy.

The *Applied* variable indicates whether a given campus, in year t, sends in a solicitation a Campus Grant. Only in the third regression model is this variable a regressor, and its coefficient is highly positive. This suggests that applying for a campus grant is correlated with a relatively high number of sex offenses, estimated at an increase of 1.4. Now, it does not logically proceed to say that applying for a grant causes more sex offenses, but it does make sense to suggest that campuses with a relatively high number of sex offenses are more likely to apply. On average, I would expect campuses with higher numbers of sex offenses to apply.

The *InGrant* variable indicates whether, at a given campus and year, there is an active Campus Grant. This variable is only used as a regressor in the last model, and is correlated in a highly *positive* manner with the number of sex offenses; on the order of a 7.5 increase. Like the *Applied* variable, this should immediately ring some warning bells, because an active Campus Grant should not be correlated with a result completely opposite that of the intention. Before we accept that Campus Grants are related to an *increase* in sex offenses, perhaps it is more likely that this is an issue of reverse causality. It makes more sense if we think in the opposite direction, that a relatively higher number of sex offenses would be correlated with having an active grant. Unfortunately, this is not what we are interesting in knowing. We want to know the effect having an active grant has on the number sex offenses.

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The *YearX* shorthand, as listed above, describes the last eight variables shown on the Figure 6. The purpose of these variables is to counteract the reverse causality problem of the *InGrant* variable. Since we cannot differentiate to what extent the *InGrant* variable influences *SexOffenses* and vice versa, we instead use these eight variables to isolate the influence of a grant for each year it functions.

As can be seen from the coefficients of these variables, a Campus Grant in its early years of functioning is highly correlated with lower numbers of sex offenses. The strength of this impact seems to drop off after the third year, but for the first three years Campus Grants have strong negative influence on sex offenses. The first year of functioning predicts a 7.0 decrease in the number of sex offenses, 5.5 fewer in year 1, 4.9 fewer in year 2, and 5.6 fewer in year 3.

VII. Conclusion

From the findings section, we know that there are, on average, obvious differences between those campuses that are awarded Campus Grants and those that are not. For those awarded grants, their average enrollment size is about 3 times larger, their average full-time retention rate is about 10% higher, and their average female percent of total enrollment is about 4% lower than the average of those without grants. Even without my regression models, it is obvious that there are systematic reasons that some campuses apply for grants, that some campuses are awarded grants over others, and that some campuses have a relatively higher number of sex offenses. The first two sets of results display this conclusion well. The control scheme, availability of on-campus housing, female percent of total enrollment, campus total enrollment size, and full-time retention rate are all statistically significant influences. There needs to be an understanding, that, because the distribution of grants is non-random, the results of the third regression should be taken with a grain of salt.

The estimated coefficients of the *InGrant* and *YearX* variables have strongly significant effects on the dependent *SexOffenses*. The *InGrant* coefficient implies that the presence of an active grant is correlated with about a 7.5 increase in sex offenses, but it is likely that campuses with an active grant already have a relatively higher number of sex offenses, and the grant may well be the intended treatment. While this may be the norm for campuses likely to receive Campus Grants, the *YearX* variables suggest counteractive, negative influences on the number of sex offenses. For at least

the first three years of functioning, the correlated negative impact is quite high;

starting at 7.0 in the first few months and tapering down to 5.6 in the third year.

It is difficult to say why there is such a dramatic drop in implied effect at *Year4*

and after. It might be due to the limited time period covered in the sample data or a

more natural diminishing of returns.

VIII. Suggestions for Future Research

A worthwhile extension of this study might utilize various standards of "likeness" to compare similar schools and better draw out the effects of a Campus Grant or the like. I would recommend trying out various enrollment size qualifiers, regional location groupings, and perhaps major specializations to see if any of these predicted sex offenses or grant award likelihood to some degree.

Another possibility would be to take the IPEDS data, and compare campuses across enrollments at different levels of education. For example, it might be interesting to see if there was some relationship between forcible sex offenses and the presence or extent of a campus's graduate level programs.

A worthwhile variable to add might be the presence of a campus police force, rather than something akin to "public safety." The relationship could be influential, though it might be difficult to tell in which direction such a relationship would be biased.

A valuable extension or line of analysis might be whether the presence of another OVW grant makes the award of a Campus Grant less likely. I would have liked to include some measure of this in my analysis, as the coefficient term would likely have been non-zero and negative if it had been a variable in either the first or second regressions. I imagine that "grant saturation" at a given campus is considered in the decision, but I lacked the time to include it.

While I did receive data on the amounts of each awarded Campus Grant,

between 2008 and 2012, I did not use this information in any of my regressions. The

amount was most commonly near $300,000, but included some huge outliers that I

feared would bias results; especially considering the small proportion of postsecondary

campuses that actually received a grant in any of the five years.   An excellent

continuation of this study would incorporate this measure, either as a replacement for

the *InGrant* variable, or as another dependent variable to test against in Regression 3.

IX: Limitations and Omissions

It is important to understand the limitations of the Clery Act sexual offense data that this study utilized. While it was true that all the examined schools filed reports based on Clery classifications, each individual sexual offense report was the product of a reporting process and culture that probably differed widely from one campus to another. This is not to say that sexual assaults differed based on the campus, but that the likelihood of a sexual assault being reported was highly variant, and in such a way that the direction of the bias was not always clear.

For example, assume that the faculty or campus police at a given campus are widely known not to believe survivors of sexual assault when they report it. While these people might be bound by Clery to report the incident regardless of their opinion, if the atmosphere created by them is hostile in any way toward a survivor, then that survivor would be less likely to tell someone. Thereby, the reported rate for that campus would be biased downward, underrepresenting the actual rate of sexual assault for a given year and potentially hiding a problem. A low rate might not indicate a low amount of sexual assault.

Consider the opposite, where a relatively high number of sexual assaults are recorded at a campus that is actively participating in sexual violence awareness and education programs, and the faculty of said campus is highly trained to respond supportively to survivors of sexual assault. If the actual number of sexual assaults was comparable to that of other campuses, this more accurate report would seem

disproportionately high in comparison. A campus like this would appear to have a large problem with sexual assault, when in truth it might be fairly average.

Without a case-by-case understanding of each campus's reporting-policy history, and lacking a method of accurately measuring sexual assault across all post-secondary campuses, there is no way to tell the direction and degree of a campus's bias.

The Clery reporting process is classified by severity, and the levels of severity are hierarchical. There are ten levels of severity: ranging from rank 1, homicide; to rank 10, alcohol, drug and weapon violations. However, these tiers are superseding, meaning that if some offense is classified as stalking (rank 9) and as robbery (rank 3), then the crime is reported to Clery as a robbery and the stalking bit is not included.

For my dataset, this means that sexual assault, ranked at 2 on the severity list, is superseded only by homicide. There are some homicides that should also count as sexual assaults, but will not appear in my analysis.

Additionally, the use of a date rape drug alone is considered aggravated assault, a rank 4 crime, rather than as sexual assault.

Clery data is recorded based on the year a given crime is reported, not when it occurred. A given year may include data that does not reflect the actual number of sexual assaults attributable to that year alone. The extent to which this occurs is unknown.

It should be understood that the grant award decision itself is judged by both a panel of peer reviewers (which are drawn from professionals who work to reduce

sexual assault) and the OVW. This means that the peer review and OVW decision both

have uncaptured effects on grant awards, and therefore fall into the error term.

The OVW manages 20 grant programs besides the Campus Grant Program;

some of which can also be awarded to postsecondary campuses. There is a possibility

that the presence of another ongoing grant makes the award of a Campus Grant less

likely.

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