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# Association Between Student Loan Debt on Graduation, Demographic Characteristics and Initial Choice of Practice Setting of Pharmacists

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### Abstract

**Objectives:** (1) To examine trends in level of student loan indebtedness for groups of pharmacists that were first licensed between 1980 and 2006; (2) To examine if demographic variables are associated with level of student loan indebtedness; (3) To examine the association between student loan debt and choice of practice setting while controlling for demographic variables.

**Methods:** Data for this study were collected from a national random sample of 3,000 pharmacists using a self administered survey. Descriptive statistics were used to examine trends in level of indebtedness. The relationships between level of indebtedness, demographic variables and practice setting choice were examined using Chi-square statistics. Multinomial logistic regression was used to determine the independent association of student loan debt and choice of practice setting while controlling for demographic variables.

**Results:** The proportion of licensed pharmacists reporting student loan debt after graduation, and the mean amount of debt incurred increased between 1980 and 2006. Non-white pharmacists incurred debt at a higher proportion compared to white, and they also incurred significantly higher levels of debt. A lower level of indebtedness was associated with choosing independent practice over chain practice.

**Conclusions:** Student loan indebtedness has been increasing over time, especially for non-white pharmacy students. Future research should be done to examine other factors that might influence student debt load, work contributions and choice of practice settings. The affordability of pharmacy education for students of color and how salaries may or may not help off-set these costs also should be examined closely.

### Introduction

Over the past few decades, there has been a sharp drop in the public share of higher education financing, shifting an increasing share of the cost burden to students<sup>1,2</sup>. Since the adoption of the PharmD as the entry level degree into the pharmacy profession in 2000, pharmacy school tuition has been on the rise.<sup>3</sup> Between 2004 and 2010, average in-state tuition for public schools of pharmacy increased by 70%.

Rising tuition coupled with a shift in student financial aid from need-based grants to loans has led to an increasing student loan debt among pharmacy school graduates.<sup>4</sup> A national survey in 2009 showed that, about 9 out of 10 graduating pharmacy students reported that they borrowed money to help pay for their college expenses, the median amount borrowed being \$100,000.<sup>5</sup> As pharmacy school tuition is likely to continue to increase because of decreasing taxpayer funding of public educational institutions, the proportion of students incurring debt and the amount of student loan debt accrued by pharmacy school graduates also is expected to continue to rise.

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It has been reported that at least at the undergraduate level, low-income students borrow more to cover their tuition costs; and they are significantly more likely than white students to say that loans had prevented them from staying in school when they did not complete a degree.<sup>6</sup> Furthermore, there is evidence in the literature that the likelihood of accruing additional student loan debt after graduation may be stopping potential applicants, especially those from economically disadvantaged backgrounds from considering graduate and professional education.<sup>7</sup> The increasing number of applicants to colleges of pharmacy suggests that high student loan debt may not yet be an inhibiting factor against acquiring pharmacy education<sup>8</sup>; however this may not be true for potential applicants who belong to low-income and/or underrepresented minority groups. Because of a desire for diversity in the workplace, there is a need to understand differential student loan debt levels in pharmacy students from disadvantaged socio-economic backgrounds. Furthermore, since there is a trend towards feminization of the pharmacy workforce, knowledge of the differential debt levels in men and women may have important implications; as women exhibit different workforce characteristics compared to men.<sup>9</sup>

It is well known that post-graduation, debt can influence students' career choices and graduates with high debts are more likely to seek out higher paying employment opportunities and work more hours at their primary place of employment.<sup>10,11</sup> In a study of pharmacists who graduated between 1993 and 2003, Mott and colleagues found that pharmacists that currently owe higher student loan debt work significantly more hours than those with low amounts of current student loan debt.<sup>4</sup> This finding suggests that student loan debt may be exercising considerable impact on amount of work contribution and workforce development. There is thus a need to understand the potential impact of debt on pharmacists' choice of practice setting and contribution to the workforce.

The theoretical foundation of the current study is based on the postulations of human capital theory.<sup>12</sup> The premise of human capital theory is that humans employ resources for the development of capacities from which an improvement of individual welfare in the future occurs. Investments in human capital improve productivity of individuals and they can thus command higher wages when they sell their labor to employers. Forms of investments in human capital include investment in individual's physical and mental health, on-the-job training and schooling.

Investment in education has benefits for both the individual and the society.<sup>13</sup> Similarly, the cost of education can be

borne by the individual, the society or both. Society bears some of the cost by direct funding of investment in education or through subsidies and publicly-financed scholarships. The private costs of investment in education borne by individuals include tuition, other educational costs and earnings forgone. An individual makes the decision to bear these costs and invest in education because of the potential future, private monetary and non-monetary returns. In the United States, a majority of students typically take out loans to bear these costs<sup>14</sup>, and these loans accumulate over time during education to create a debt burden after graduation. Hence, faced with a decision to make a choice between different jobs after graduation, a rational individual will choose the job that maximizes his earnings in order to offset the cost of investment in human capital and reap maximum returns. It is thus expected that having student loan debt will spur newly licensed pharmacists to choose higher paying jobs post graduation. If the wages that pharmacist's labor command in the market varies by practice settings,<sup>15-17</sup> it can be hypothesized that pharmacist with higher student loan debt post-graduation will choose employment in higher paying practice settings, all else being constant.

### Objectives

The objectives of this study were: (1) to examine trends in level of student loan indebtedness for groups of pharmacists that were first licensed between 1980 and 2006; (2) to examine if demographic variables are associated with level of student loan indebtedness; (3) to examine the association between student loan debt and choice of practice setting while controlling for demographic variables.

### Methods

#### *Data Source and Sample*

This study used data from the 2009 National Pharmacists Workforce Survey. The design of the survey has been more fully described elsewhere.<sup>18</sup> The 2009 National Pharmacist Workforce Survey used a cross-sectional, descriptive survey design to collect data from a random sample of licensed pharmacists in the continental United States. Using open-ended questions, respondents were asked to report their year of first licensure, their student loan debt at time of graduation, current balance of their student loan debt and the practice setting of their first job after graduation. The survey was conducted between March and August 2009.

Of the 3,000 survey forms mailed to pharmacists, 333 (11%) were considered "undeliverable or not applicable" and 1,395 were considered a "survey response" yielding a 52% response rate. The survey forms that were considered "undeliverable" were those that could not be delivered to the intended participant for a number of reasons including wrong address.

The assessment of non-response bias has been described elsewhere.<sup>18</sup> The usable surveys for the purpose of this analysis were those in which pharmacists reported the year of first licensure to be between 1980 and 2006 and responded to the question requesting the amount of student loan debt they incurred after graduation (n= 711). An assessment of potential outliers was conducted by (1) plotting distribution of debt amount and (2) identifying any cases for which the amount was ten times greater or ten times less than the mean. For those first licensed between 1985 and 1989, one case was ten times greater than the mean (i.e. greater than \$400,000). Thus, 710 cases were included in this study.

#### *Trends in the level of indebtedness*

The study encompassed the time period between 1980 and 2006. We defined a respondent's indebtedness relative to those who were first licensed in the same year. For each year of licensure, respondents who reported having some student loan debt at graduation were categorized into those having low debt and high debt based on the median of reported, non-zero debt distribution.

The trend in level of indebtedness was examined in two ways. First, we compared the proportion of respondents having no debt to those that reported low and high amount of student loan debt for five-year periods between 1980 and 2006. The 2005-2006 time period encompassed only two years because no pharmacist in our sample was licensed after 2006. Second, for respondents reporting debt after graduation; we examined differences in average amount of debt for five-year periods between 1980 and 2006 using analysis of variance (ANOVA). For this study, we adjusted reported debt amounts to constant 2009 dollars using the consumer price index (US city average, all items).

#### *Association between student debt load and demographic variables*

We examined the relationship between student loan debt at graduation and key demographic variables. Differences in proportion of respondents reporting zero, low and high amount of student loan debt at graduation were examined for gender (male or female) and ethnicity (white or non-white). Chi-Square analysis was used to compare proportions among groups of respondents using SPSS version 17. For respondents reporting low and high amount of debt, we compared the average debt amount reported by male and female; white and non-white using t-tests.

#### *Impact of student loan indebtedness on choice of practice setting*

To examine the association of debt with practice setting choice after graduation, the dependent variable was a categorical variable identifying the practice setting of employment for respondents' first job after graduation. Practice setting was defined as independent (single ownership pharmacies with fewer than four (4) stores under the same ownership), chains (traditional chains with four (4) or more stores under the same ownership), mass merchandisers/supermarkets, hospitals, and others. The key independent variable included in this study was level of indebtedness (zero debt, low debt and high debt); others were gender, ethnicity and decade of graduation.

A multinomial logit model predicting respondents first practice setting choice after graduation was calculated based on level of indebtedness (zero, low and high debt), gender (male, female), ethnicity (white, non-white) and decade of graduation (1980s, 1990s, 2000s). A multinomial logit model is a generalization of logistic regression to outcomes with more than two levels and it is used when the dependent variable is nominal and unordered.<sup>19</sup> The choice of chain setting was used as a comparator group and the model was estimated using maximum likelihood. The statistical significance of the coefficients was determined using t-statistics. We assessed the significance and the fit of the overall multinomial logit model using Chi-Square statistic and McFadden R<sup>2</sup> respectively. McFadden R<sup>2</sup> tests a model against the alternative that the model 'does not fit' and it is commonly used for assessing the goodness-of-fit of multinomial logit models.<sup>20</sup>

#### **Results**

Table 1 shows that about two (2) out of every three (3) pharmacists reported graduating with some student loan debt over the study period. A majority of the respondents in our study sample was female (60.7%), white (81.1%) and were first licensed in the 1980s and 1990s (82.4%). Chain pharmacy was the most common practice setting after graduation (38.4% of respondents).

The proportion of pharmacists reporting having student loan debt at graduation increased from 55% for pharmacists licensed between 1980 and 1984 to 87% for pharmacists licensed between 2005 and 2006 (Table 2). Similarly, the proportion of respondents having high student loan debt increased over the study period. Only 23.8% of respondents that were licensed in the 1980-1984 period reported a high student loan debt while 39.1% of those licensed between 2005 and 2006 reported a high amount of student loan debt. Between 1980 and 2006, the proportion of pharmacists reporting a high student loan debt increased by about 160%.

Of the respondents who had reported having student loan debt at graduation, the mean debt amount (adjusted to constant 2009 dollars) increased over the study period, from \$25,707 for those licensed between 1980 and 1984 to \$88,004 for those licensed in the 2005-2006 period ( $p < 0.001$ ). Also over the entire study period, non-white respondents reported a significantly higher average debt amount compared to white respondents (\$60,441 compared to \$42,778;  $p < 0.001$ ). There was no association between debt and, gender or choice of practice setting (see Table 2).

Multinomial logistic regression analysis showed that when adjusted for demographic variables, level of indebtedness appeared to have an impact on the choice of practice setting (Table 3). The coefficient estimates from our model suggest that having a low debt was associated with choosing an independent setting relative to chain setting. However choosing mass merchandiser/supermarket, hospital and other settings compared to chain setting was not associated with level of indebtedness.

The variables that best predicted respondents' choice of practice settings were the demographic characteristics (gender, ethnicity, decade of graduation). Men were more likely than women to choose independent and mass merchandiser/supermarket settings relative to chain settings while non-white respondents were less likely than whites to choose independent settings relative to chain settings. Choice of practice setting also was associated with decade of graduation. Compared to the 1980s, respondents who were first licensed in the 1990s and 2000s were more likely to choose mass merchandiser/supermarket relative to chain settings.

## Discussion

In recent years, there has been a rise in both the cost of pharmacy education and level of indebtedness of pharmacy school graduates. Our findings showed that between 1980 and 2006, a high proportion of licensed pharmacists graduated from pharmacy school with some amount of student loan debt and the average amount of debt accrued has been increasing. This finding is similar to results of the 2009 graduating pharmacy student survey which showed that 87.4% of graduating pharmacy students borrowed money for college expenses.<sup>21</sup>

The increasing number of applicants to pharmacy schools signifies that expectation of indebtedness may not yet be deterring potential applicants from applying to pharmacy schools. Because of the handsome remuneration for pharmacists; pharmacy education continues to be attractive despite high tuition costs. Pharmacists' salaries have been

increasing at a rate higher than the rate of inflation.<sup>22</sup> This suggests that pharmacists have been earning enough income to pay back the loans accrued while receiving pharmacy education. It is possible that pharmacists are making a higher annual loan debt repayment today than in the past decades, but the proportion of income spent on debt repayment may not be increasing. It is thus likely that the return on investment of pharmacy education is good enough to attract potential applicants to pharmacy education despite the high level of indebtedness post graduation. However, it is not known whether this will remain true if pharmacists' salaries stagnate. Also, a pharmacy career, much like other health care professional careers has substantial non-monetary benefits including job security, the care-giving nature of the work and ability to enter or leave practice. These non-monetary benefits also can make a pharmacy career more attractive and serve as a rationale for assuming increased debt burden.

Our findings show that non-white pharmacists reported having student loans at a rate higher than that of whites based on both proportion with debt at graduation ( $p = 0.01$ ) and the average amount of debt reported ( $p < 0.001$ ). It is thus possible that high tuition costs and likelihood of indebtedness can restrict access to pharmacy education for minority groups and potential applicants from lower socioeconomic background. In an attempt to better understand this finding, we examined the differences in the average amount of debt for five year periods between 1980 and 2006 stratified by race, using two-way analysis of variance. After controlling for year of licensure, race was still a significant predictor of debt load after graduation ( $p = 0.014$ ) but there was an interaction between year of licensure and race ( $p = 0.046$ ). As shown in figure 1, in the 1980s, white and non-white respondents practically incurred the same amount of student loan debt. However, between 1990 and 2006, non-white respondents reported a significantly higher amount of student loan debt at graduation. One possible explanation for this is the changing composition of "non-whites" in our sample over the study period. Between 1980 and 2004, the proportion of non-whites who were Asians increased from 22.2 % to 69.0% while the proportion of non-whites who were Black/African decreased from 44.4% to 10.3%. Thus, in the 1980s, non-white respondents in our sample were more likely to be black; but by 2006 they were more likely to be Asian. More research is needed to understand these trends.

According to the postulates of the human capital theory, a rational individual will choose the job that maximizes his earnings in order to offset the cost of investment in education and reap maximum returns.<sup>23</sup> We hypothesized that pharmacists with higher student loan debt after

graduation will tend to choose employment in higher paying practice settings. Compared to new pharmacists with high debt, we found that those with low debt were more likely to choose independent relative to chain setting after controlling for gender, ethnicity and decade of graduation (Table 3). This finding is not surprising as independent pharmacy settings are known to offer lower hourly wages to pharmacists.<sup>17</sup> However, we did not find significant associations between level of indebtedness and choosing mass merchandisers/supermarket, hospital or other settings compared to chain settings; suggesting that differences in wage levels for these settings are not large enough to make a practical difference when pharmacists contemplate choosing a practice setting after graduation. Also, other factors known to affect the choice of practice setting were not examined in this study and this may be another explanation for these findings. Such factors include availability of job at time of graduation, employment trends at time of graduation, geographical location of different practice settings, inability to relocate, personal and family issues.<sup>24-26</sup>

Several demographic variables were associated with the choice of independent setting compared to chain setting. Men were more likely than women to choose independent relative to chain settings and compared to whites, minorities were more likely to choose chain relative to independents. One possible reason for this finding is the lower degree of flexibility in work schedules in independent pharmacies. Women seek out more flexibility in schedules because they are more likely to work part-time and leave the workforce for childbearing.<sup>18</sup>

### Limitations

The 2009 National Pharmacists Workforce Survey was not specifically designed to provide information about student loan debt and associated variables. Hence, some variables related to student loan debt were not collected and this is a limitation of this study. Such factors include marital status of respondents as at time of graduation, variability in tuition fees among private and public schools of pharmacy, income trends of white and non-white pharmacists. We had a small

sample size for respondents that were first licensed between 2005 and 2006. We thus suggest that comparisons between this group of respondents and those that were first licensed in earlier time periods should be interpreted with caution. Also we have no information on respondent's household debt at the time of graduation. Since respondents were asked to report events that happened in the past, there is a possibility of recall bias.

### Conclusion

The findings of this study showed that pharmacists' student loan indebtedness has been increasing over time. We also found that pharmacy students who were minorities may be incurring more student loan debt than whites. Demographic variables proved to be significantly related to choice of practice setting after graduation. Our findings highlight impact of the level of student loan indebtedness on choice of employment setting. Compared to new pharmacists with low debt, we found that those with high debt were more likely to choose higher-paying chain pharmacies relative to independent pharmacies; highlighting the utility of the human capital theory in understanding the cost and returns to pharmacy education.

Other factors that can impact the relationship between student loan debt and pharmacists' workforce contribution include variability in tuition trends among private and public pharmacy schools, income trends of white and non-white pharmacists, and geographical locations of different pharmacy practice settings. Further research should be directed to studying these issues.

**Table1. Sample characteristics (n=710)**

Variable	N (%) <sup>a</sup>
Setting	
Independent	72 (12.6)
Chain	219 (38.4)
Mass merchandiser/Supermarket	38 (6.7)
Hospital	185 (32.5)
Other employment settings <sup>b</sup>	56 (9.8)
Level of indebtedness at graduation	
Zero debt	247 (34.8)
Low debt	251 (35.4)
High debt	212 (29.9)
Gender	
Male	279 (39.3)
Female	431 (60.7)
Ethnicity	
White	574 (81.1)
Non-white <sup>c</sup>	134 (18.9)
Decade of Graduation	
1980s	292 (41.1)
1990s	293 (41.3)
2000s	125 (17.6)

<sup>a</sup> Numbers may not add up to 710 due to missing data. Percentages may not add up to 100 due to rounding.

<sup>b</sup> Includes nuclear, clinic, academic and other settings.

<sup>c</sup> Includes Hispanic, Native American, African American and other.



Table 2. Year of Licensure, Race and Gender Versus Debt

Variables	Percent with <sup>a</sup> :			Debt Amount at Graduation <sup>b</sup>
	Zero debt	Low debt	High debt	Mean (SD)/ \$
Year of Licensure (n)				
1980 -1984 (160)	45.0	31.3	23.8	25,707 (27,041)
1985 -1989 (132)	40.2	31.8	28.0	33,794 (26,633)
1990 – 1994 (149)	35.6	33.6	30.9	41,609 (38,596)
1995- 1999 (144)	31.3	38.2	30.6	47,940 (36,235)
2000 -2004 (102)	20.6	42.2	37.3	73,663 (45,036)
2005 – 2006 (23)	13.0	47.8	39.1	88,004 (41,902)
	$X^2$ , p =0.007			ANOVA, p<0.001
Ethnicity (n <sup>c</sup> )				
White (574)	35.9	36.8	27.4	42,778 (36,120)
Non-white (134)	30.6	29.1	40.3	60,441 (49,837)
	$X^2$ , p =0.010			t-test, p<0.001
Gender (n)				
Male (279)	32.3	35.1	32.6	44,851 (39,949)
Female (431)	36.4	35.5	28.1	47,161(39,761)
	$X^2$ , p =0.364			t-test, p=0.540
Practice setting (n <sup>c</sup> )				
Independent (72)	37.5	43.1	19.4	33,219 (29,774)
Chain (219)	39.7	29.2	31.1	49,228 (43,453)
Mass merchandiser/ supermarket (38)	31.6	39.5	29.9	44,454 (23,864)
Hospital (185)	27.6	38.4	34.1	44,428 (38,787)
Others (56)	37.5	33.9.	28.6	44,323 (40,473)
	$X^2$ , p=0.121			ANOVA, p=0.224

<sup>a</sup>Cells represent proportion of pharmacists in each debt level category. Percentages may not add to 100 because of rounding.

<sup>b</sup> For respondents reporting non-zero debt, adjusted to constant 2009 dollars.

<sup>c</sup>Numbers may not add up to 710 due to missing data.

Table 3. Multinomial logit model predicting practice setting choices (n=570)<sup>a</sup>

Variable	Independent vs. Chain	Mass Merchandiser /Supermarket vs. Chain	Hospital vs. Chain	Other settings <sup>b</sup> vs. Chain
Level of indebtedness	<b>Coefficient(t-statistics)</b>			
Zero debt	0.39(1.06)	0.09(0.04)	-0.46(3.32)	0.14(0.14)
Low debt	0.84(5.14) <sup>&amp;</sup>	0.45(1.06)	0.16(0.43)	0.27(0.48)
High debt	Reference	Reference	Reference	Reference
Gender				
Male	0.67(5.59) <sup>&amp;</sup>	0.76(4.36) <sup>&amp;</sup>	0.11(0.29)	-0.08(0.05)
Female	Reference	Reference	Reference	Reference
Ethnicity				
Non-White <sup>c</sup>	-1.01(4.02) <sup>&amp;</sup>	-0.23(0.22)	-0.22(0.62)	0.07(0.04)
White	Reference	Reference	Reference	Reference
Decade				
2000s	-0.45(0.69)	1.38(5.79) <sup>&amp;</sup>	0.11(0.11)	0.63(1.75)
1990s	-0.01(0.00)	1.2(7.27) <sup>§</sup>	-0.35(2.46)	0.53(2.45)
1980s	Reference	Reference	Reference	Reference

Model chi-square =50.00, p=0.001, McFadden Pseudo R<sup>2</sup>=0.03.

<sup>a</sup>Number is not equal to 710 due to missing data.

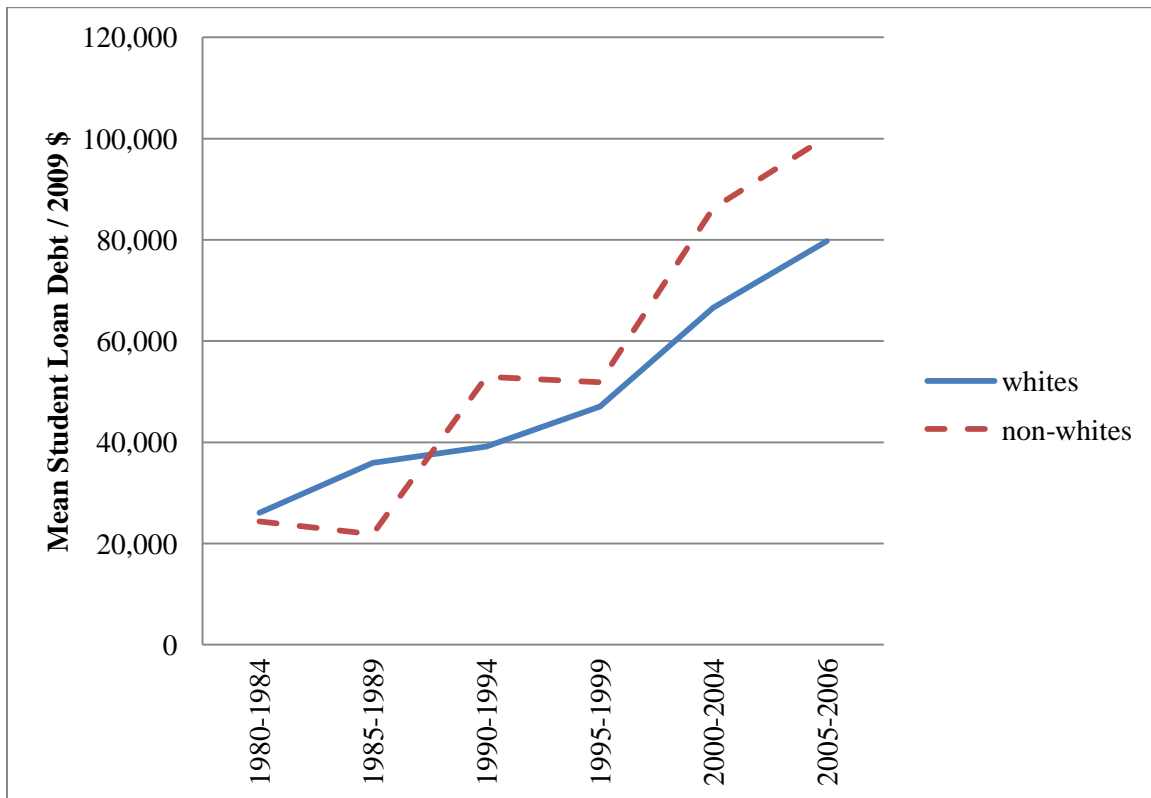
<sup>b</sup>Includes nuclear, clinic, academic and other settings.

<sup>c</sup>Includes Hispanic, Native American, African American and others.

<sup>§</sup>p<0.01.

<sup>&</sup>p<0.05.

Figure 1: Mean student loan debt (constant 2009 \$) versus year of licensure for white and non-white respondents<sup>a</sup>



<sup>a</sup>Mean student loan debt was computed for respondents reporting non-zero debt. Reported debt amounts were adjusted to constant 2009 dollars using the consumer price index.

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