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ARTICLE

Textbook Broke: Textbook Affordability as a Social Justice Issue

J. Jacob Jenkins*, Luis A. Sánchez*, Megan A. K. Schraedley†, Jaime Hannans*, Nitzan Navick‡ and Jade Young§

In light of rising textbook prices, open education resources (OER) have been shown to decrease non-tuition costs, while simultaneously increasing academic access, student performance, and time-to-graduation rates. Yet very little research to date has explored OER's specific impact on those who are presumed to benefit most from this potential: historically underserved students. This reality has left a significant gap of understanding in the current body of literature, resulting in calls for more empirically-based examinations of OER through a social justice lens. For each of these reasons, this study explored the impact of OER and textbook pricing among racial/ethnic minority students, low-income students, and first-generation college students at a four-year Hispanic Serving Institution (HSI) in Southern California. Drawing upon more than 700 undergraduate surveys, our univariate, bivariate and multivariate results revealed textbook costs to be a substantial barrier for the vast majority of students. However, those barriers were even more significant among historically underserved college students; thus, confirming textbook affordability as a redistributive justice issue, and positing OER as a potential avenue for realizing a more socially just college experience.

Keywords: OER; open education resources; student equity; redistributive justice; Hispanic Serving Institution

The rising cost of college textbooks has been well documented (e.g., Senack & Donoghue 2016). Since the late 1970s, textbook prices have increased more than 1,000% (DiGangi 2015). Through the 1980s, prices increased three times the rate of inflation (Popken 2015), and since the 2000s, they surged four times inflation rates (Weisbaum 2016). As a result, the average undergraduate student today spends \$1,200–\$1,300 per year on textbooks and supplies. In the United States, this sum equates to 72% of the total tuition and fees at an average two-year institution, and 26% of the total tuition and fees at an average public four-year institution (USGAO 2005; see also USGAO 2013).

Fortunately, as textbook prices continue to increase, so has the use of open education resources (OER)—openly licensed materials that can be accessed, edited, and shared without cost or restriction (Hewlett Foundation 2017). After surveying over 2,700 faculty, Seaman and Seaman (2017) found OER use at two- and four-year institutions had nearly doubled between 2016 and 2017. That figure

is projected to triple by year 2021 (Cengage 2016), as faculty awareness nears 50% (Allen 2019) and OER adoption in introductory courses begins to rival that of traditional textbooks (Straumsheim 2016; see also Allen & Seaman 2016). Consequently, OER are estimated to have saved students over \$1 billion dollars worldwide between 2013–2018 (Allen 2018; Nyamweya 2018), with the potential to save students an additional \$1.4 billion each year in the United States alone (Senack 2015).

Despite OER's ability to reduce current price barriers to higher education (Hodgkinson-Williams & Arinto 2017), very little research to date has explored OER's specific impact among those who are presumed to benefit most from that potential: historically underserved student populations (see Arbor 2011; Jenkins et al. 2018; Clinton & Khan 2019; Colvard, Watson, & Park 2018; Delgado, Delgado, & Hilton 2019). This is because OER and textbook affordability studies typically control for issues of difference, or else fail to disaggregate their final data altogether. Other studies intentionally control for such factors through propensity score matching (PSM) or multilevel modeling (MLM). As Ekowo (2017) writes:

Researchers are currently unable to tell us whether OER are working as well for ... students of color, low-income students and other student populations... This is a significant limitation in available research

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on OER. Those who study innovative educational practices have a responsibility to unearth how such strategies improve – or don't improve—the success of every student. (para. 7, 8)

Such a dearth of understanding makes it impossible to gauge the impact of textbook costs on entire student populations, prompting calls for additional OER research among historically underserved populations (Colvard et al. 2018; Figlio, Rush, & Yin 2013) – particularly through a social justice lens (Lambert 2018).

Because of the current oversight in literature relating to OER and textbook costs' repercussions on underserved groups, this study explored the social justice implications of textbook affordability among racial/ethnic minorities, low-income students, and first-generation college students at a four-year Hispanic Serving Institution (HSI) in Southern California. By examining this specific student population, our study offers the first empirical study of textbook affordability's influence on stress levels, purchasing habits, first-day access, academic performance, and time-to-graduation rates among historically underserved college students (Virginia Commonwealth University 2019).

We begin this process with a brief review of relevant literature, further highlighting OERs' uncertain effect on underserved populations and their potential role in redistributive social justice. Drawing upon more than 700 undergraduate student surveys, we then detail the quantitative methodology used in our study. Next, we reveal our study's univariate, bivariate, and multivariate results. We then discuss our findings, which show textbook costs to be a substantial barrier for the vast majority of students surveyed. Those barriers were found to be even more significant, however, among racial/ethnic minorities, low-income students, and/or first-generation college students. In light of these results, we conclude by affirming the disproportionately negative impact of textbook costs on historically underserved students as a social justice issue, while calling for the prioritization of affordability in order to promote educational equity.

In the end, the goals of this study are multifaceted. We not only hope to shed light on the gap that exists within current OER literature regarding difference, but also to address this oversight by offering empirically-informed results on the impact of textbook pricing. By doing so, we aim to spur other researchers in pursuing a similar line of inquiry. We also hope to highlight how OER can be used to promote student equity in higher education, while offering guidance to university staff, faculty, and administrators who aspire to help realize a more socially just college experience.

Literature

The burgeoning field of OER research has increased exponentially in recent years. Research topics include OER's impact on student enrollment (Grewe & Davis 2017), faculty perceptions (Jung, Bauer, & Heaps 2017), teaching practices (Lane & McAndrew 2010), public engagement (Scanlon 2014), funding policies (Stacey 2013),

classroom ecology (Blyth 2014), institutional culture (Cox & Trotter 2016), multicultural competence (Lin & Wang 2018), and digital proficiency (Ramirez-Montoya, Mena, & Rodriguez-Arroyo 2017), to name but a few. Although a limited number of these studies negatively correlate OER with student performance (Gurung 2017; Robinson 2015), while others yield mixed results (Delgado et al. 2019) or inconclusive findings (Griggs & Jackson 2017), the overwhelming consensus of OER research reveals consistently high levels of academic quality and efficacy.

Fischer et al.'s (2015) multi-institutional study of over 15,000 students spanning ten institutions, for example, found students who used OER typically outperformed those who used traditional textbooks. OER users were also more likely to take additional credits in the subsequent semester, thus improving their time-to-graduation rates. Meanwhile, a meta-analysis by Hilton (2016) of nine previous studies revealed no evidence of OER negatively affecting student learning outcomes. Rather, three of the meta-analysis' nine studies showed a significantly positive correlation between OER use and learning outcomes. The remaining six studies revealed mixed and/or nonsignificant findings.

Additional studies have shown OER to positively influence student grades (Winitzky-Stephens & Pickavance 2017), buy-in (Sapire & Reed 2011), accessibility (Cooney 2017), study habits (Jhangiani & Jhangiani 2017), sense of perspective (Choi & Carpenter 2017), and so on. Consequently, Ross, Hendricks, and Mowat (2018) found 73% of students rated their open textbooks as "excellent" or "above average," and Bliss et al., (2013) found a staggering 89% of educators and 94% of students rated their open course materials as being equal or better in quality than the traditional textbooks they previously used.

Textbook Affordability Among Historically Underserved Students

Although OER exhibit positive potential related to textbook affordability and academic achievement, few studies have explored that potential among historically underserved students (Clinton & Khan 2019; Gurung 2017). Due to increasingly high textbook prices, it is believed that OER can reach socially excluded students (Lane 2013), increase participation among underrepresented groups (Bossu, Bull, & Brown 2012), and bridge the gap between formal and informal education (Meiszner 2011). Each of these assumptions emphasize OER's presumed ability to bring more socially just practices into higher education (Hodgkinson-Williams & Trotter 2018). There is still a dearth of empirically-based evidence, however, on the specific role and impact of OER versus traditional textbooks among racial/ethnic minorities, low-income students, and first-generation college students.

One reason for this lack of research among historically underserved students is that previous studies rarely account for issues of difference, while others fail to disaggregate their final results (Ekowo 2017; Hilton & Laman 2012). Fischer et al.'s (2015) aforementioned study of over 15,000 students, for instance, used propensity score matching (PSM) to mitigate such factors as race/ethnicity.

Similarly, Winitzky-Stephens and Pickavance's (2017) examination of student outcomes used multilevel modeling (MLM) to control for student differences. Although they found a positive correlation between OER use and grades, they did not explore the role of personal demographic factors.

Within the small body of OER literature that acknowledges difference, research is often confounded by a lack of rigorous controls (i.e., Grewe & Davis 2017; Ozdemir & Hendricks 2017; Pawlyshyn et al. 2013). Figlio, Rush, and Yin (2013) offer one of the only OER studies to consider student-level demographics in higher education. Contrary to the majority of OER literature, their study found test scores for Latinx¹ students to be higher in the case of live instruction, as compared to OER-based courseware. Yet contrasting OER-based courseware with live instruction still fails to inform how Latinx students respond to open materials when live instruction is also present. Figlio, Rush, and Yin conclude by advocating for future research that more closely examines sensitive student subgroups (i.e., historically underserved populations).

Most other OER studies recognizing difference are relegated to primary and secondary education. One such examination of the Enlarged City School District in Middletown, New York credited its new OER curriculum with closing both graduation-rate gaps and test score achievement gaps entirely. As Horn (2018) reports, this progress occurred even as the number of racial/ethnic minorities in the district doubled to 84% and students receiving free or reduce-priced lunches rose over 30 points to 74%. Yet again, such examinations have not been conducted at the university level, even as student demographics in higher education increasingly diversify: "So as colleges become more diverse, disaggregated performance data will be essential to understanding if our efforts are having their desired impact for all students" (Ewoko 2017, para. 8).

Colvard et al.'s (2018) large-scale study of OER adoption offers the only known exception to this trend by disaggregating student performance based on race/ethnicity, financial need, and registration status: "We are not aware of any research that has evaluated student performance with regard to student financial need or disaggregated student data to better understand the impact OER might be having on various student subpopulations" (p. 264). Notably, Colvard and his colleagues not only found OER to positively influence grades and to decrease withdrawal rates for all students, but also to do so at higher rates for low-income students, part-time students, and racial/ethnic minorities. In the end, such a gap in OER literature not only perpetuates the higher education system's neglect of historically underserved students, but also overlooks the potential for textbook affordability to promote social justice values (Jenkins et al. 2018).

Textbook Affordability as Redistributive Social Justice

Social justice refers to the fair and unprejudiced rights of an individual with regards to systemic/societal norms, privileges, opportunities, etc. Contemporary understand-

ings of social justice are heavily influenced by the 20th century writings of John Rawls (1971), who first outlined the two primary principles of liberty and equality. From this framework, more recent social justice scholars have detailed the three specific dimensions of *redistributive justice* (Keddie 2012), *recognitive justice* (Fraser 2005), and *representational justice* (Young 1997). Redistributive justice promotes "the distribution of resources towards individuals who by circumstances have less" (Lambert 2018: 227). Recognitive justice promotes respect for diversity and difference; representational justice promotes equitable voice and participation.

Each of these three dimensions merit further attention from OER scholars for their pedagogical ability to incorporate marginalized views, imagery, experiences, and perspectives (see Lambert 2018). As the most long-established dimension of social justice, however, redistributive justice is particularly pertinent to this study's focus on textbook affordability. OER holds promise for facilitating redistributive justice by reducing course material costs for those who have otherwise been marginalized in/through formal educational processes. Redistributive justice is therefore intrinsically tied to the role educational institutions play in liberating personal potential and promoting social mobility (Agartan 2014; El Khoury 2015), a reality exemplified by the United Nations General Assembly's (1948) characterization of education as a fundamental human right (see Biswas-Diener & Jhangiani 2017).

Despite open education's potential to help students who "by circumstances have less," the number of OER studies with an implicit focus on social justice has become increasingly rare, prompting Lambert (2018) to question: "Where is social justice in contemporary open education literature?" (p. 226). Lambert's ensuing analysis revealed the implication of social justice principles within most foundational OER texts (e.g., UNESCO 2002). In later years, those implications dissipated as OER's focus began to overlap with dominant educational discourses: "As a theme in the literature, social justice faded, particularly as the field broadened and came to more closely resemble mainstream eLearning" (p. 237). Lambert subsequently echoes the aforementioned sentiments of Ekowo (2017), Figlio et al. (2013), and Colvard et al. (2018) by calling for more empirically-based research that examines OER's potential for redistributive social justice among historically underserved students.

For each of these reasons—OERs' increased use in higher education, coupled with their relatively unexamined connection to redistributive social justice for historically underserved student groups—this study explored the impact of textbook costs among racial/ethnic minority students, low-income students, and first-generation college students. The subsequent section outlines our quantitative methodology for doing so in more detail.

Methodology

In order to explore the impact of OER and textbook pricing on historically underserved college students, this study surveyed over 700 undergraduates at a public four-year university in Southern California. Designated as an

HSI, the university boasted a uniquely diverse student population, making it especially suited for this research study's focus on historically underserved college students. The present section further details our (1) research participants, (2) student surveys, and (3) analytic process.

Research Participants

Participants for this study were recruited via convenience and snowball sampling. Using the university's learning management software (i.e., Canvas), authors began by sharing a link with their students to the study's online survey. Students were assured their responses were voluntary and anonymous; their choice to participate had no effect on their academic standing. Students were given a minimum of one week to respond. The survey was then shared with additional faculty members across campus, in an effort to obtain a larger representation of the university's overall study body. This process continued until responses were received from 10% of the university's total student population ($n = 705$).

Of the 705 undergraduate students who chose to participate, 69% self-identified as female, 29% male, and 2% other. Forty-five percent self-identified as Latinx, 37% White, 7% multiracial, 6% Asian, 4% Black, and 2% other. Twenty majors were represented from across campus, with the three most frequent responses being Communication (18%), Business (17%), and Psychology (12%). Approximately 70% of students were dependent on financial aid for college, and 60% were first-generation college students. On average, students were currently enrolled in fifteen units, with a median grade point average of 3.2. Their median age was 21. Each of these measures were proportionate to the university's larger population, allowing us to generalize our findings for its entire student body.

Student Surveys

The survey used for this study was created using Google Forms. It consisted of 43 questions, divided into six sections. The survey's first section asked demographic questions, such as age, gender, race/ethnicity, and first-generation status. In order to determine students' first-generation college status, the survey supplied them with the most commonly accepted definition of this term: "For the purposes of this study, a first-generation college student is defined as a student whose parent(s) or legal guardian(s) have not completed a bachelor's degree" (see Fernandez 2018).

The second section of this study's survey asked students about their current semester (e.g., how many classes they were enrolled in, how many of their classes used free/online resources). Section three asked students about their textbook purchasing habits. Sample questions included: "Have you ever not bought the required textbook for a class due to cost?," "Have you ever not had a textbook on the first day of class due to cost?," "Have you ever not bought a textbook for class due to cost, and later felt it hurt your performance during the semester?," etc. Sections four and five asked about the students' study habits and course material preferences (e.g., how often

they used the textbooks assigned in class, which types of materials they preferred using in class). The final section included four open-ended questions about the students' best and worst experiences, both with OER and traditional textbooks respectively. In order to avoid any undue confusion among student participants, the phrase "free/online resources" was used in lieu of "OER" throughout sections two through six. A complete version of our survey (licensed CC BY) can be viewed online at: <https://docs.google.com/forms/d/1WvlayFUgxuGEOY7HW9nHlDa2qUebzn60-Hzr5UXlyOQ/edit?usp=sharing>.

Analytic Process

We examined our survey results utilizing univariate, bivariate, and multivariate analyses. First, we used univariate analyses (means and proportions) to examine student responses to OER-related questions, and to provide a general portrait of their educational experiences. Next, we used bivariate analysis (chi-square and t-tests) to compare the experiences of students from historically underserved groups. Chi-square tests examined differences between groups on categorical outcome/dependent variables (e.g., whether students did not buy the required textbook due to cost), while t-tests were used to compare for significant differences between groups on continuous outcome/dependent variables (e.g., self-rated stress levels). Given the correlation between demographic and socioeconomic characteristics, we then employed multivariate linear and logistic regression models. This allowed us to investigate the significant predictors of educational burdens related to OER and textbook affordability, while also accounting for various factors. We used ordinary least squares (OLS) linear regression for continuous outcome variables while utilizing logistic regression for dichotomous, categorical outcomes. When comparing racial/ethnic groups, our analyses were limited to Latinx and White students. Mirroring the university's demographic profile, these two groups accounted for nearly 80% of total respondents, thus, leaving a relatively small sample of other races/ethnicities.

Results

In review, this study explored the impact of textbook costs on undergraduate students at a four-year, HSI in Southern California—with particular emphasis on historically underserved populations. Because our data relied on a 10% sampling of the overall student body ($N = 705$), we used inferential statistics to generalize our findings to the larger university population. These results revealed textbook prices to pose an educational burden for the overwhelming majority of respondents, yet several of those barriers were found to be even more significant for racial/ethnic minorities, low-income students, and/or first-generation college students.

Univariate Results

Our univariate results revealed textbook prices to be a barrier for most college students, when measured according to stress levels, purchasing habits, first-day access, academic performance, and time-to-graduation rates

(**Table 1**). In total, 89% of all students reported feeling additional stress due to textbook costs. Furthermore, student responses averaged 7.0 when asked to measure their increased stress levels on a Likert-type scale from 1 to 10 (1 = no stress; 10 = extreme stress).

In addition to increased stress, nearly two-thirds of students (65%) reported not buying a required textbook due to cost, and 80% reported not having their required textbook on the first day of class due to cost. A majority of students (56%) did not buy a required textbook due to cost and later felt it hurt their performance in the class; nearly half (44%) did not buy a required textbook due to cost, even though they knew beforehand it would hurt their performance in the class. Regarding time-to-graduation rates, more than a quarter of students (27%) avoided taking class, 12% reported dropping class, and 9% reported failing class due to textbook costs.

Bivariate Results

In conjunction with our univariate results, bivariate analyses revealed several statistically significant correlations in relation to race/ethnicity, income status, and first-generation status—each of which exposed a disproportionately negative effect of textbook costs upon historically underserved student populations.

Racial/ethnic minorities

Over 91% of Latinx students reported feeling additional stress due to textbook costs, as compared to only 86% of White participants ($p < .05$). When asked to measure that stress on a Likert-type scale from 1–10 (1 = no stress; 10 = extreme stress), Latinx students also reported a significantly higher level of stress than their White counterparts: 7.23 versus 6.45 ($p < .001$). Along with increased stress levels, approximately 84% of Latinx students reported not having first-day access to their necessary course materials due to cost ($p < .05$). Nearly one-third of Latinx students admitted to avoiding a class altogether due to textbook costs ($p < .05$), and 12% attributed textbook costs as the reason for failing at least one college course ($p < .01$). Each of these findings were statistically significant when compared to White student participants, whose average responses were 75%, 23%, and 4% respectively (**Table 2**).

Low-income students

Our bivariate analyses of students who reported being dependent on financial aid also revealed several sta-

tistically significant correlations. Again, each of these significant findings exposed a disproportionately negative effect of textbook costs on low-income students (**Table 3**). Nearly 91% of low-income students reported feeling additional stress due to textbook costs, as compared to only 84% of those who were independent of financial aid ($p < .05$). In addition, aid dependent students reported

Table 1: Univariate Results from All 705 Student Surveys.

Educational Burden Type	Students Affected
Experienced increased stress levels due to textbook costs	89%
Ratings of increased stress levels (Likert-type scale of 1–10)	7.0
Did not buy required textbook for class due to costs	65%
Did not have textbook on the first day of class due to costs	80%
Did not buy textbook due to costs and later felt it hurt performance	56%
Did not buy textbook due to costs, knowing it would hurt performance	44%
Avoided taking class due to textbook costs	27%
Dropped class due to textbook costs	12%
Failed class due to textbook costs	9%

Table 2: Statistically Significant Results for Latinx Students.

Educational Burden Type	White	Latinx
Experienced increased stress levels due to textbook costs	85.7%	91.1%*
Ratings of increased stress levels (Likert-type scale of 1–10)	6.45	7.23***
Did not have textbook on the first day of class due to costs	75.0%	83.6%*
Avoided taking class due to textbook costs	22.6%	30.7%*
Failed class due to textbook costs	4.4%	12.3%**

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3: Statistically Significant Results for Students Dependent on Financial Aid.

Educational Burden Type	No Fin. Aid	Fin. Aid
Experienced increased stress levels due to textbook costs	84.4%	90.9%*
Ratings of increased stress levels (Likert-type scale of 1–10)	6.34	7.14***
Did not have textbook on the first day of class due to costs	74.1%	82.5%*
Did not buy textbook due to costs and later felt it hurt performance	49.8%	58.6%*

Note: Fin = financial.

* $p < .05$, ** $p < .01$, *** $p < .001$.

feeling a significantly higher level of stress than their peers: 7.14 versus 6.34 ($p < .001$).

Low-income students were also less likely to have first-day access to their materials and more likely to feel textbook costs had negatively impacted their learning. Specifically, 83% of low-income students reported not having their materials on the first day of class due to cost ($p < .05$); 59% reported not buying their course materials due to cost, and later feeling that decision hurt their academic performance ($p < .05$). Comparatively, the response from students who were not dependent on financial aid was 74% and 50% respectively.

First-generation college students

Due in part to the uniquely high percentage of first-generation college students at the university used for this study, first-generation status was our third major area of focus via inferential analysis. Our bivariate analyses revealed even more statistically significant correlations for this student population than for racial/ethnic minorities or low-income students. Yet again, each of these correlations showed textbook costs to have a disproportionately negative impact on historically underserved college students—including stress levels, purchasing habits, first-day access, academic performance, and time-to-graduation rates (Table 4).

Approximately 91% of first-generation college students reported additional stress from textbook costs; 86% of non-first-generation students reported additional stress ($p < .05$). On a Likert-type scale from 1-10 (1 = no stress; 10 = extreme stress), first-generation college students measured this stress as 7.14, versus 6.52 among non-first-generation students ($p < .01$). More than 84% of first-generation college students reported not buying a required textbook for class due to cost, as compared to 73% of non-first-generation students ($p < .001$), and nearly 68% of first-generation college students did not have their textbook on the first day, as compared to 61% of non-first-generation students ($p < .05$). Nearly two-thirds of first-generation college students (61%) did not buy their textbook for class and later felt it hurt their performance, as compared to 49% of non-first-generation students ($p < .01$). Almost one half of first-generation college students (48%)

did not buy their textbooks for class, knowing beforehand it would hurt their performance, as compared to 39% of non-first-generation students ($p < .05$). Finally, nearly twice as many first-generation college students reported failing a class due to textbook prices, as compared to non-first-generation students (11% v. 6%; $p < .05$).

Multivariate Results

In addition to our bivariate results related to textbook affordability and the utilization of free/online resources, we also employed multivariate analyses to examine which indicators remain significant predictors after controlling for additional factors, such as transfer status (i.e., students who begin coursework at one institution before moving to another institution). Results within Table 5 show odds ratios, with values larger than one indicating variable groups with a higher likelihood of responding “yes” to the question at hand. Using a 95% confidence threshold ($*p$ value $< .05$), asterisks indicate results that are statistically significant.

Our previous bivariate findings suggested Latinx and first-generation students were more likely than White and non-first-generation students to experience increased stress due to textbook costs, but our multivariate analyses demonstrated these differences as nonsignificant after controlling for financial aid and transfer status. Once we controlled for transfer, first-generation, and financial aid status, we also found Latinx students were as likely to experience stress due to textbook prices as White students (p value $> .05$). That said, we found significant associations in our multivariate analyses concerning other outcome variables. For instance, transfer students (odds ratio = 1.53; p value $< .05$) were 53% more likely than non-transfer students to avoid buying their textbooks due to price. Low income students (odds ratio = 1.59; p value $< .05$) and transfer students (odds ratio = 1.90; p value $< .01$) were also more likely to report not having a textbook on the first day of class because of cost. Additionally, low income students (odds ratio = 1.53; p value $< .05$) were 1.5 times more likely to report not buying a textbook for class and later believing it hurt their performance in the course. Similarly, transfer students (odds ratio = 1.78; p value $< .01$) were significantly more likely than non-transfer

Table 4: Statistically Significant Results for First-Generation College Students.

Educational Burden Type	Non-First-Gen	First-Gen
Experienced increased stress levels due to textbook costs	85.9%	91.0%*
Ratings of increased stress levels (Likert-type scale of 1–10)	6.52	7.14**
Did not buy required textbook for class due to costs	73.4%	84.3%***
Did not have textbook on the first day of class due to costs	60.5%	67.9%*
Did not buy textbook due to costs and later felt it hurt performance	48.7%	60.8%**
Did not buy textbook due to costs, knowing it would hurt performance	38.5%	48.2%*
Failed class due to textbook costs	6.3%	11.2%*

Note: Gen = generation.
 * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5: Multivariate Logistic Regression Predicting Textbook Experiences.

	Ever Experienced Stress		Did Not Buy Text		No Text on First Day		No Text – Hurt Performance		No Text Knowing it Would Hurt Performance		Avoided Class		Failed Class	
	Full Model	Odds Ratio Sig.	Full Model	Odds Ratio Sig.	Full Model	Odds Ratio Sig.	Full Model	Odds Ratio Sig.	Full Model	Odds Ratio Sig.	Full Model	Odds Ratio Sig.	Full Model	Odds Ratio Sig.
Latinx (ref = white)	1.40 n.s.		1.09 n.s.		1.46 n.s.		1.11 n.s.		1.17 n.s.		1.65*		3.26**	
First Generation (ref = non first-gen)	1.19 n.s.		1.25 n.s.		1.44 n.s.		1.36 n.s.		1.22 n.s.		0.88 n.s.		0.97 n.s.	
On Financial Aid (ref = not on aid)	1.40 n.s.		1.13 n.s.		1.59*		1.53*		1.21 n.s.		0.95 n.s.		0.73 n.s.	
Transfer (ref = non-transfer)	0.80 n.s.		1.53*		1.90**		1.78**		1.46*		1.10 n.s.		0.89 n.s.	

* $p < .05$, ** $p < .01$, *** $p < .001$.

students to experience negative academic performance due to not buying their textbook for class.

Our multivariate findings also demonstrate how some students decided to not buy a textbook due to price even when they knew beforehand it would hurt their performance in the course. Transfer students (odds ratio = 1.46; p value < .05) were nearly 1.5 times more likely than non-transfers to forgo purchasing a textbook knowing beforehand it would later hurt their academic performance. We also found Latinx students (odds ratio 1.65; p value < .05) were significantly more likely than White students to avoid taking class due to textbook costs, and Latinx students (odds ratio = 3.26; p value < .01) were three times more likely to report failing a class due to textbook costs. These last two findings are particularly salient given their direct implication on student retention and time-to-graduation rates.

Discussion

Consistent with previous research, the results of this study verify textbook costs as an additive burden for the vast majority of today's college students (Martin et al. 2017). Regardless of race/ethnicity, income or first-generation status, students consistently reported textbook pricing to negatively impact their stress levels, purchasing habits, first-day access, academic performance, and time-to-graduation rates. The educational hardships posed by high textbook prices were even more significant, however, for historically underserved student groups—particularly in regard to stress, (first-day) access, class choice, and academic performance. Thus, the disproportionately negative effect of course material costs on historically underserved students reemphasizes textbook affordability as a redistributive social justice issue.

This study's results affirm textbook costs to be a social justice issue for several reasons, beginning with student access. Eighty-four percent of college professors believe students are unable to pass their course without having first purchased the required course materials (Zogby 2005). Therefore, the disproportionate number of low-income and first-generation college students in this study who were unable to buy their required textbooks due to cost reveals an equivalently disproportionate likelihood of those same students to underperform academically, based on their inability to access said course materials.

In addition to students' unequal access to required materials, the timing in which students obtain that access also posits textbook affordability as a social justice issue. Several studies indicate the positive effects of first-day access on student success. Jhangiani and Jhangiani (2017) found 70% of students rated the importance of immediate access as either "very important" or "absolutely essential"—an even higher rating than cost savings (68%). Baker et al. (2015) found that simply opening the required text prior to class was a major predictor of academic achievement, and Agnihotri, Essa, and Baker (2017) found that high performing students accessed their course materials within the first few days of class. Therefore, costly textbooks not only place an unjust burden on student populations who

are unable to purchase the required materials, but also on those who are unable to do so in a timely manner—a reality echoed in this study among Latinx, low-income, and first-generation college students (see also McKenzie 2018).

Textbook costs unjustly affect the long-term success of historically underserved students as well. This is because racial/ethnic minorities and first-generation college students who avoid or fail classes due to textbook pricing (as indicated by this study's results) are simultaneously delaying the pace at which they complete their degree. Such decreased time-to-graduation rates have direct and indirect influences upon student loan debt, career paths, and—ultimately—lifetime earnings (Snider 2014). Houle and Addo (2018) found racial/ethnic minorities acquire 85% more student loan debt than their White peers and hold 185% more student debt fifteen years postgraduation. Other studies have shown every 10% increase in student loan debt decreases a graduate's likelihood to become a homeowner by 2% (Mezza et al. 2016), and every \$5,000 increase in student load debt decreases a graduate's likelihood to pursue their most desired profession by 5% (Gervais & Ziebarth 2019). Conversely, college students who graduate debt-free are 138% more likely to pursue an advanced degree (Kantrowitz 2010) and have saved 100% more toward retirement by age 30 (Rutledge, Sanzenbacher, & Vitagliano 2016).

The social justice implications of textbook costs are especially salient in light of the complex relationship between education and marketization, and the position that academic publishers occupy between the two (Natale & Doran 2012). Assessments like those completed by The Student Public Interest Research Groups (PIRGs) found many publishers to intentionally engage in business practices aimed at increasing course material costs (Senack 2014, 2015; Senack & Donoghue 2016). These business practices include the precipitous release of new editions that lack substantial updates or improvements. Other questionable business practices include licensing and bundling, which can result in the need to spend hundreds of dollars on supplementary materials beyond the cost of a textbook alone. Yet with only five corporations controlling over 80% of the United States' \$8.8 billion publishing market, today's academic publishers enjoy an oligopoly that insulates them from competition: "In the textbook industry, no...system of checks and balances exist. The professor chooses the book, but the student is forced to pay the price. Because of this, the student is, in essence, a captive market" (Senack 2014: 6).

In the end, the unjust burden created by course material costs on historically underserved students—combined with the cost-savings potential of OER and the current oligopolistic state of academic publishing—reveal the United States' education system to be far from the meritocratic bastion it proposes to be. Rather, educational institutions and academic publishers in the United States have created a systemic condition in which students' learning potential is limited by their purchasing power. This realization exposes a social mandate for universities to take more concerted efforts toward their increased use of no-cost course

materials. The ultimate responsibility of eliminating educational barriers in higher education falls upon those with the power to do so, and public universities are compelled to bridge achievement gaps perpetuated by costly course materials (Civil Rights Project 2011). Accordingly, university staff, faculty, and administrators should include textbook affordability as part of their broader efforts to promote student equity (Adams & Bell 2016). Said differently: Universities must heed this study's empirical results by using OER and/or other no-cost course materials to pursue a more socially just classroom, university, and higher education system writ large.

Conclusion

In light of mounting textbook prices, OER adoption has shown to decrease non-tuition costs, while simultaneously increasing student access, academic performance, and time-to-graduation rates. Because preceding studies either fail to disaggregate their data or to adequately account for difference, however, very little research to date has examined the specific impact of OER and textbook pricing on historically underserved student populations (for the only known exception, see Colvard et al. 2018). This reality has left a significant gap of understanding in current bodies of literature, prompting calls for more empirically-based examinations of OER through a social justice lens (Lambert 2018; Ekowo 2017; see also Colvard et al. 2018; Figlio et al. 2013). For each of these reasons, the present study explored OER's connection to redistributive social justice among racial/ethnic minority students, low-income students, and first-generation college students at a four-year HSI in Southern California. Drawing upon more than 700 undergraduate surveys, our results confirmed textbook costs to be a substantial barrier for the vast majority of students. Yet those barriers were even more significant among historically underserved college students; thus, confirming textbook affordability as a redistributive justice issue.

The United States' higher education system has long been criticized as falling short in addressing the educational needs of historically underserved groups, particularly among California's growing number of Latinx students (Matkin 2009). Meanwhile, Harley et al. (2010) contend that low-income students are more likely to rely on no-cost course materials than their counterparts because of these students' dependence on resources provided by their institution (Civil Rights Project 2011). Consequently, one potential avenue for addressing the disproportionately negative effects of textbook costs affirmed by this study is through a greater institutional commitment to the use of OER and other no-cost course materials. Two notable exemplars who have already pursued this goal at the institutional level are Tidewater Community College (TCC) and California State University Channel Islands (CSUCI). In the fall of 2013, TCC became the first college in the United States to offer what it coined as a "Z-degree:" an associate's degree pathway relying entirely on OER (Wiley et al. 2016). This milestone was later extended to four-year universities when CSUCI introduced

the first zero-textbook-cost majors (i.e., "Z-majors") in the California State University system—and perhaps the first undergraduate Z-majors in the entire nation (D'Angelo 2018; Gonzalez 2018; Kelly 2018). CSUCI's Z-majors do not rely solely on OER, per se, but utilize openly licensed texts alongside library resources, government reports, fair use copyright, etc. Nonetheless, TCC and CSUCI each illustrates OER's ability to increase access and cost savings for both associate's and bachelor's degrees, while simultaneously realizing a more socially just college experience.

As significant as this study's findings are to the future of higher education, further research is still needed to explore the social justice implications of OER and textbook affordability. As Hockings, Brett and Terentjevs (2012) attest, the skills required to teach diverse students effectively are not well understood at the college or university level. This unawareness is due in part to diversity's multifaceted and everchanging condition, sans clear or universal constructs of what it means to be a "diverse" student in the first place (Hockings et al. 2012; see also Jenkins 2014a, 2014b; Jenkins & Dillon 2012). Relatedly, Andrade et al. (2011) have long since called for scholars to extend examinations of OER beyond cost mitigation alone to include novel pedagogical approaches—a call that was echoed again in this study to incorporate marginalized voices via redistributive justice, cognitive justice, and representational justice (see also Lambert 2018). Finally, future scholars should also examine textbook prices in conjunction with other non-tuition costs (e.g., housing expenses, food insecurity, transportation costs). Although beyond the scope of this particular study, such research holds promise for a more holistic understanding of the educational barriers faced by today's college students, while contributing empirically-informed best practices on how universities can address textbook affordability as a social justice issue.

Note

- ¹ Latinx is a gender-neutral term used in lieu of Latino and Latina that refers to people of Latin American culture and/or racial identity within the United States.

Additional File

The additional file for this article can be found as follows:

- **Student Survey Results.** Raw survey results from student questionnaires. DOI: <https://doi.org/10.5334/jime.549.s1>

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Competing Interests

The authors have no competing interests to declare.

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