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Study Abroad for Low-income Students: The Relationship Between Need-based Grant Aid and Access to Education Abroad

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Cover Page Footnote

We are grateful to Jennifer May-Trifiletti and Noelle Witherow, as well as two anonymous reviewers, for their constructive feedback on this manuscript. All remaining errors are our own.

Study Abroad for Low-income Students: The Relationship Between Need-based Grant Aid and Access to Education Abroad

By: Melissa Whatley & Ashley B. Clayton

This study explores factors related to low-income students' decisions to participate in study abroad while focusing specifically on the role of need-based grant aid in this decision-making process. Estimates account for systematic differences between students receiving and not receiving need-based grant aid using propensity score modeling (PSM) before disaggregating models by need-based grant aid status. Results indicate that need-based grant aid significantly increases a student's probability of participating in study abroad. Additionally, disaggregated models show that the study abroad decisions of students receiving need-based grant aid differ significantly from those not receiving this aid, particularly when considering other forms of financial aid, such as loan debt. Specifically, low-income students appear to take on additional loan debt to access study abroad when they do not receive need-based grant aid. These findings have important implications for policy and practice that is focused on increasing access to study abroad to a diverse U.S. student population.

Keywords: *Study abroad, low-income students, need-based grant aid*

In April of 2019, the Senator Paul Simon Study Abroad Program Act was introduced in committee to the U.S. Senate (NAFSA, 2019). This bill reiterates what many in the international education field have been advocating for years – that international experience and knowledge are essential to the success of college graduates in today's global economy (NAFSA, 2019). Indeed, prior research suggests that study abroad is among the most efficient ways in which students can acquire valuable skills such as foreign language ability, intercultural competency, and international awareness (e.g., Engle & Engle, 2004; Freed, 1995; Lokkesmoe, Kuchinke, & Ardichvili, 2016; Regan, Howard, & Lemée, 2009; Williams, 2005). To this end, recent reports from the Institute of International Education are promising in that in the 2017-18 academic year, over 340,000 U.S. students studied abroad for academic credit, an increase of more than 2% over the prior academic year (IIE, 2019). However, consistent increases in study abroad participation at U.S. institutions of higher education hide a persistent lack of diversity in education abroad, which continues to be comprised primarily of white, female, and upper-middle socioeconomic status students (Dessoff, 2006; Luo & Jamieson-Drake, 2015; Salisbury, Umbach, Paulsen, & Pascarella, 2009).

Researchers and education abroad professionals alike cite a lack of financial means to pay for an international experience as a primary barrier to study abroad participation among underrepresented students

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(e.g., Brux & Fry, 2010; Chieffo, 2001; Dessoff, 2006; Luo & Jamieson-Drake, 2015; McClure, Szelenyi, Niehaus, Anderson, & Reed, 2010; Van Der Meid, 2003). At the same time, researchers have failed to explore the study abroad participation patterns among the student population that is possibly most vulnerable in this regard: low-income students. These students may be less likely to participate in study abroad given their low-income status but may also receive need-based grant aid that mitigates the negative relationship between low-income status and financial ability to participate in educational activities such as study abroad. Indeed, students have been able to use federal financial aid for study abroad, including Pell grant funding, which is awarded to low-income undergraduate students, since the 1992 Higher Education Act. This act mandated that students could use federal financial aid for study abroad as long as they participated in a program approved by their home institution (NAFSA, 2018).

The current study aims to fill this gap in the literature through an exploration of the study abroad participation of low-income students and focuses especially on the relationship between need-based grant aid and a student's decision to study abroad. Specifically, the following research questions guide this study:

1. What is the relationship between receiving need-based grant aid and study abroad participation among low-income students?
2. What factors (demographic, financial, and academic) predict study abroad participation among low-income students who receive need-based grant aid and those who do not?
3. Are there significant differences in patterns of participation between these two groups of students (those who receive need-based grant aid and those who do not)?

Conceptual Model

This study is guided by Perna's (2006) multi-level model of college choice, which outlines factors to explain students' postsecondary educational decision-making, adapted to the study abroad context. Just as students decide to enroll in college, they also decide whether to enroll in study abroad (Luo & Jamieson-Drake, 2015; Salisbury et al., 2009; Salisbury, Paulsen, & Pascarella, 2010, 2011). Perna's (2006) model conceptualizes enrollment decisions as nested within four contextual layers: (1) student/family context (habitus); (2) school/community context; (3) higher education context; and (4) social, economic, and policy context.

Human Capital Theory is at the center of Perna's (2006) conceptual model, which assumes that students' college choice behaviors are based on a comparison of expected benefits with expected costs (Becker, 1993). Perna's (2006) model also proposes that students make postsecondary decisions based on their supply of resources (family income and financial aid) and demand for education (academic preparation and academic achievement). From this perspective, one might expect the study abroad decision-making of low-income students to differ substantially from that of their higher-income counterparts. Additionally, one might also expect that low-income students receiving financial aid (e.g., need-based grant aid) to make substantially different study abroad decisions from those who do not receive such aid.

Perna's (2006) model suggests that a student's decision to participate in higher education (or study abroad, in this case) is not based solely on financial factors. The innermost layer of this model, student and family context, represents a student's *habitus*. An individual's habitus is an internal system of beliefs, thoughts, and perceptions that is shaped by one's environment and experiences, and inevitably influences postsecondary enrollment decisions (Bourdieu & Passeron, 1977; McDonough, 1997; Perna, 2006). In this view, even if students have access to financial resources to pay for higher education, and subsequently study abroad, their cost/benefit analyses of these experiences may not lead them to pursue such endeavors based on their individual *habitus*. The second layer of the model, school and community context, is focused on resources, supports, and barriers that influence students' college-going decisions (Perna, 2006). In terms of study abroad, low-income students may be less likely to be exposed to international travel in their family, K-

12 schools, and communities compared to those from higher-income families (Simon & Ainsworth, 2012; Weenink, 2014). Given their low-income status, students with financial need likely lack not only necessary financial resources but also come from families *(habitus)* and *school/community* contexts wherein study abroad participation is not the norm (Simon & Ainsworth, 2012).

Further, both third and fourth layers of Perna's (2006) model also likely influence students' decisions to study abroad. In the *higher education* context, a student's major and study abroad offerings at their institution likely influence their decision to study abroad (Whatley, 2019). Likewise, the broader *social, economic, and policy* contexts can also influence a student's study abroad decision, as these larger factors can encourage or discourage international travel. While we focus primarily on how students' financial resources or lack-thereof relate to their study abroad decision, we acknowledge that study abroad decisions take place within the many layers that comprise Perna's (2006) conceptual model. As such, we position variables corresponding to these layers as control variables in our statistical models.

Prior Literature

Two bodies of literature inform this study. The first examines the relationship between financial aid and the higher-education-related decisions of low-income students. While this literature provides insight into the relationship between financial aid and students' decisions surrounding college enrollment, persistence, and completion, there is limited research that addresses other decisions that students make while in college as they relate to financial aid (Boatman & Long, 2016). A second body of literature describes factors contributing to students' decisions surrounding study abroad. As this section will demonstrate, this prior work has uncovered numerous relationships between student characteristics and study abroad participation. However, very limited research addresses the relationship of financial aid to study abroad participation (Salisbury et al., 2009; Whatley, 2017), and none of this work focuses specifically on low-income students.

Low-Income Students and Financial Aid

Low-income students enroll in college at lower rates compared to their middle- and high-income peers (Ma, Pender, & Welch, 2016). Those that do enroll in college often receive need-based financial aid, such as the federally funded Pell Grant. Indeed, need-based aid is the primary method used by the federal government and institutions of higher education to increase enrollment of low-income students (Baum, 2016; Dynarski & Scott-Clayton, 2013). Although the Pell Grant provides financial support for low-income students, there is not substantial evidence that it increases postsecondary enrollment or persistence (Baum & Scott-Clayton, 2013; Hansen, 1983; Kane, 1994; Rubin 2011). Some researchers suggest that the Pell Grant may not be of sufficient size to make a difference in enrollment decisions (Rubin, 2011). In the 2017-18 academic year, the maximum Pell Grant was $5,920, which has increased from the 2007-08 maximum of $4,310 (Dortch, 2018). One study did find that the Pell Grant has a positive, significant effect on college persistence and reduces the likelihood of dropping out (Bettinger, 2004). As such, while Pell funding specifically may not affect student enrollment decisions as much as one might expect, it does seem to relate to students' decisions about higher education once they enroll in college. Study abroad may be one of these decisions.

Several studies have examined the relationship between other forms of need-based financial aid and the success of low-income students in college (Castleman & Long, 2016; Goldrick-Rab, Kelchen, Harris, & Benson, 2016; Kane, 2003). Researchers have found that need-based financial aid has a positive impact on college outcomes (Castleman, Schwartz, & Baum, 2015). For example, two studies have found that state financial aid programs with a need-based component have positive effects on immediate postsecondary enrollment after high school (Castleman & Long, 2016; Kane, 2003). Specifically, a need-based grant program in California increased college enrollment by 3-4 percentage points (Kane, 2003). Similarly, a need-based award program in Florida increased the likelihood of students earning a Bachelor's degree in six years

by 4.6 percentage points (Castleman & Long, 2016). Further, researchers found that need-based grants randomly assigned to Pell Grant recipients in Wisconsin increased retention rates by 1-3 percentage points per term and the likelihood of on-time degree attainment by 4.7 percentage points (Goldrick-Rab et al., 2016).

Despite many efforts to provide low-income students with information about postsecondary education, many qualified low-income students never apply to college or for financial aid (Castleman et al., 2015; Castleman & Page, 2014). While many low-income students would qualify for financial aid and other forms of need-based aid, some of these students do not take advantage of these financial aid opportunities while in college (Avery & Hoxby, 2004; Boatman et al., 2017; Perna, 2008). Further, two studies have found that over 13 percent of students who enroll in college and would be eligible for need-based aid never actually apply (King, 2004; Kofoed, 2017). Although there have been numerous efforts to simplify the application for Free Application for Federal Student Aid (FAFSA) and provide students with more information about financial aid opportunities, unfortunately many low-income students who would be eligible for such aid miss out on funding because they never apply. According to a recent national study of high school graduates, 29 percent of students in the lowest socioeconomic quintile did not complete the FASFA compared to 22 percent of students in the highest quintile (Bahr, Sparks, & Hoyer, 2018). Indeed, as the following section indicates, some of the low-income students included in this study's sample did not receive need-based grant funding while enrolled in college. This lack of financial resources likely influences many of their decisions surrounding higher education, including the decision to participate in education-enhancing opportunities like study abroad.

Who Studies Abroad?

Prior investigations have taken a variety of perspectives when exploring factors that contribute to a student's decision to participate in study abroad. One line of research has sought to identify specific barriers to and motivations for study abroad participation, finding that employment obligations and family responsibilities serve to deter students' participation in international experiences (De Jong, Schnusenberg, & Goel, 2010; Sanchez, Fornerino, & Zhang, 2006) while the opportunity to have fun and experience new things are common motivators of study abroad (Anderson, 2008). In support of the notion that students conduct a cost/benefit analysis when considering study abroad are the results of Goel, De Jong, and Schnusenberg (2010), who found that students' beliefs surrounding the benefits of study abroad to their future career trajectories significantly related to their study abroad participation patterns. Similarly, Hackney, Boggs, and Borozan (2012) found that the value students placed on benefits of study abroad, such as foreign language proficiency, predicted their willingness to participate.

Most related to the current study is a line of research that explores the relationship between students' background characteristics and their study abroad participation patterns. Luo and Jamieson-Drake (2015) found that factors positively related to first-year students' intent to study abroad included being female, having plans to obtain an advanced degree, spending time socializing with friends in high school, intending to understand other cultures, and expecting to be satisfied with college and to participate in student-centered clubs and groups (including fraternities and sororities) while in college. These findings are largely echoed by other researchers (Naffziger, Bott, & Mueller, 2008; Rust, Dhanatya, Furuto, & Kheiltash, 2008; Salisbury et al., 2009), who also found that factors such as academic achievement and distance between college and a student's home were positive predictors of study abroad (Paus & Robinson, 2008; Stroud, 2010). Additional inquiry has focused exclusively on groups of students who are currently underrepresented in U.S. study abroad, such as underrepresented racial minorities (e.g., Brux & Fry, 2010; Guerrero, 2006; Kasravi, 2009; Lozano, 2008; McClure et al., 2010; Salisbury et al., 2011; Simon & Ainsworth, 2012; Van Der Meid, 2003), males (e.g., Gore, 2005; Lucas, 2009; Salisbury et al., 2010; Shirley, 2006), community college students (Amani, 2011; Amani & Kim, 2018), and first-generation students (Andriano, 2010). While almost all of this

literature mentions finances in some form or another as a significant barrier to study abroad participation, either through the direct cost of study abroad or the foregone earnings costs that students incur when they spend time abroad rather than earning wages, research that specifically focuses on the relationship between financial aid and study abroad participation is only beginning to emerge. Moreover, this recent work has yet to focus exclusively on the student population that is possibly most vulnerable to financial barriers to study abroad participation: low-income students.

Financial aid and study abroad. Prior research exploring financial aid and study abroad participation has accounted for variations in students' finances in several ways, despite a lack of focus on low-income students. For example, Paus and Robinson (2008) presented evidence that the financial contributions that students' families made to their educational expenses positively related to study abroad participation. In examining financial aid, Salisbury et al. (2009) and Salisbury et al. (2010) found that students, especially females, receiving federal grants were less likely to intend to study abroad compared to those who did not receive such grants. In additional analyses, Salisbury et al. (2011) found this same result specifically among White students. In contrast, federal grant aid related positively to intent to study abroad among Hispanic students. In considering other types of student aid, these authors found that among Hispanics, receiving student loan aid negatively predicted study abroad intent. Among Asian American students, institutional grant aid related positively to intent to study abroad. In a recent study, Whatley (2017) found that increased amounts of both need- and non-need-based grant aid related to an increased likelihood of study abroad participation while increases in aggregated student loan amounts appeared to discourage study abroad participation. All this prior work has analyzed data from students representing a wide range of income backgrounds.

The current study builds on this research through an examination of the role of need-based grant aid in the study abroad decision-making of low-income students specifically. In this way, it expands on knowledge surrounding financial aid and student decision-making more generally, financial aid and study abroad, and the study abroad participation patterns specifically of low-income students, a group that has yet to be the focus of empirical inquiry in the study abroad literature.

Method

Data

The dataset employed in this study originates from the Georgia Learning Outcomes of Students Studying Abroad Research Initiative (GLOSSARI) and was collected between 2001 and 2008 from students enrolled at institutions in the University System of Georgia (USG), the unified system of 26 public higher education institutions in the state of Georgia (http://usg.edu). Although this dataset is somewhat older than might be ideal, it is currently the only multi-institutional dataset that contains detailed information surrounding both study abroad participation and financial aid. This dataset follows students from their entry into the USG (initial enrollment/transfer in) through their exit (graduation, transfer/drop out). Specifically, data were collected at five points during a student's enrollment at a USG institution: first semester of enrollment, a semester immediately prior to possible study abroad participation, semester of study abroad, semester immediately following study abroad, and last semester of enrollment. For students who did not study abroad, a randomly selected academic term served as the semester of potential participation. In addition to containing information about students' study abroad experiences, this dataset also contains rich information on students' financial resources (e.g., expected family contribution, student loans), academic characteristics (e.g., GPA, major), and basic demographic information at various points in time throughout students' studies. This information allowed us to account for other aspects of students' backgrounds and their higher education contexts in our statistical models. Although the selection of students with study abroad experience for inclusion in the dataset was straightforward in that these students represent all students who

studied abroad for academic credit from USG institutions between 2001 and 2008, students without study abroad experience were selected randomly from USG's data system by the creators of the GLOSSARI.

The analyses presented here make use of a subset of this dataset, defined by students' expected family contribution (EFC) amounts. Specifically, students whose EFC during their first semester of enrollment at a USG institution totaled to $5,000 or less were retained for analyses. This decision was made given that students were eligible for federal need-based grant aid (i.e., Pell) if their EFC was $4,110 or less during the 2007-08 academic year, thus providing an operational definition of *low-income*. The $5,000 cut-off point was chosen so that students who exhibited a low EFC and received need-based financial aid from sources aside from the federal government, but did not qualify for federal grant funding, were included in the data subset. Given that this definition of low-income required information concerning a student's familial financial resources, analyses were by default limited to students who filed a Free Application for Federal Student Aid (FAFSA). In total, this data subset consisted of 4,068 students with complete data, 1,356 (33.3%) with study abroad experience and 2,712 (66.7%) without. Of these students, 1,920 (47.2%) received need-based grant aid during their first term of enrollment, while 2,148 (52.8%) did not. During the semester immediately prior to a student's possible study abroad participation, 1,063 (26.1%) students received need-based grant aid, while 3,005 (73.9%) did not.

There are several reasons why a student with a low EFC, who is otherwise eligible for federal need-based aid, might not receive any aid aside from not making the federally mandated EFC cut-off. One example is that students are disqualified from receiving Pell grant funding if they have a criminal record (Department of Education, 2018). Another more common example is that students with low EFC amounts are often asked to complete additional paperwork over the course of the verification process (Smith, 2018). This verification process asks students to submit documentation such as a tax transcript and W-2 statements to verify that the information submitted to the federal government is accurate. Per federal mandate, some students are selected at random for verification when they receive their student aid report from the Office of Federal Student Aid, while other students must complete the verification process because they attend colleges that verify all FAFSA forms. As such, even if a student completes the required federal paperwork and otherwise qualifies for federal need-based aid, they may not receive Pell funding without submitting additional paperwork to the institution. Although the dataset used for this study does not contain information about *why* low-income students did not receive need-based financial aid, 465 of the 1,094 students with an EFC of zero did not receive any need-based grant aid during their first term of enrollment.

Analyses

Propensity score modeling. Because need-based financial aid is not randomly assigned to students, and because there is reason to suspect that low-income students receiving and not receiving need-based aid are systematically different from one another, we used propensity score modeling to account for the non-random assignment of students into need-based aid groups (treatment and control). This analytic strategy provides a means of establishing statistical baseline equivalency on observable characteristics among these two student groups in the absence of true randomization (Lewis, 1973; Rubin, 2005). The first step of analysis consisted of the estimation of a probit model as in (1)

$$Z_i^s = \beta^{s\prime} X_i^s + \epsilon_i^s, \tag{1}$$

wherein Z_i^s is the probability, ranging from 0 to 1, that a student received need-based grant aid in a given semester. This probability was estimated based on a vector of student-level characteristics, X_i^s, including basic demographic characteristics (e.g., gender, race/ethnicity), type of institution attended (research or non-research institution), approximate age at enrollment (calculated by subtracting a student's birth year from the year during which they enrolled at a USG institution), and a student's expected family contribution during

the first semester of enrollment (see the first column in Table 1). This propensity toward receipt of need-based grant aid was then used to assign *b(x)* to each student, a balancing score that is assumed to approximate an individual's empirical propensity toward treatment assignment *e(x)*. This assumption bases propensity toward treatment on observed student characteristics and ignores the possibility that unobserved or unmeasured factors, such as a student's parents' level of educational attainment, may also influence selection into the treatment condition (Rosenbaum & Rubin, 1983). A student's balancing score, *b(x)*, was then used to create a propensity score weight, *w(x)*, representing a student's likelihood of receiving need-based grant aid (treatment). This weight was calculated as in (2)

$$w(x) = K\frac{f(z=1|x)}{f(z=0|x)} = K\frac{b(x)}{1-b(x)}, \quad (2)$$

where *K* is a normalizing constant that cancels out in analysis (Ridgeway, McCaffrey, Morral, Burgette, & Griffin, 2016). This weight is, by default, equal to 1 for all students who received need-based grant aid, and ranges in value for students not receiving need-based grant aid based on their propensities toward treatment assignment. Calculating propensity score weights in this way provides a way to estimate average treatment effect on the treated (ATT), which assesses the effect of treatment (in this case, receiving need-based grant aid) on the outcome (study abroad) (Ridgeway et al., 2016).

Table 1

Variables Included in Analyses

Propensity Score Modeling	**Regression Analyses**
Outcome: Need-based aid receipt	*Outcome:* Study abroad participation
	Predictor of interest: Need-based aid receipt
Demographic Characteristics	*Demographic Characteristics*
Gender	Gender
Race/ethnicity	Race/ethnicity
In-state residency	In-state residency
First-term Characteristics	*Pre-Study Abroad Financial Aid*
Approximate age at enrollment	Amount of non-need-based grant aid
Expected family contribution	Amount of aggregate subsidized loans
Research institution attendance	Amount of aggregate unsubsidized loans
	Academic Characteristics
	Research institution attendance
	GPA
	Major field of study
	Class standing

In this study, we considered receipt of need-based grant aid at two time points during a student's tenure at a USG institution: first semester of enrollment and semester immediately prior to possible study abroad participation. For this reason, we estimated propensity scores using the steps just outlined twice, once for each time point. Table 2 displays the balance of the two student groups (those receiving and not receiving need-based grant aid) before and after applying propensity score weights to the data, while Figures 1 and 2 illustrate the distribution of propensity scores from which weights were derived for each of the two semesters considered. As Table 2 indicates, in a student's first semester of enrollment, four significant differences between students receiving and not receiving need-based grant aid were present prior to

weighting. Specifically, students receiving need-based grant aid had, on average, significantly lower amounts of expected family contribution and were less likely to be male, to be Black, and to attend a research institution. After weighting, only one of these significant differences remained, that concerning expected family contribution in a student's first semester of enrollment. This remaining significant difference further motivated the inclusion of measures of students' financial resources during college (i.e., financial aid) in this study's primary analyses, described next.

When taking receipt of need-based grant aid in the semester immediately prior to a student's possible study abroad participation as the treatment, six significant differences were present prior to weighting (see Table 2). Students receiving need-based grant aid reported significantly lower expected family contribution amounts and were significantly younger at enrollment in a USG institution compared to their non-need-based-grant-aid counterparts. These students were also more likely to attend a research institution. Concerning race/ethnicity, students receiving need-based grant aid were more likely to be Asian or Hispanic, but less likely to be Black. After weighting, none of these significant differences persisted.

Table 2

Balance of Treatment (Need Aid) and Control (No Need Aid) Groups Before and After Weighting

	Treatment: Need Aid in First Semester			**Treatment: Need Aid in Semester Prior to Potential Study Abroad**		
Variable	Need Aid	No Need Aid (raw)	No Need Aid (weights)	Need Aid	No Need Aid (raw)	No Need Aid (weights)
Age at enroll	21.71	21.96	21.77	21.12	22.10***	21.23
Exp. fam. cont.	1091	2040***	966**	1245	1714***	1239
Research institution	0.42	0.48***	0.42	0.48	0.44**	0.48
Male	0.30	0.33*	0.30	0.30	0.32	0.31
Asian	0.08	0.09	0.08	0.10	0.08*	0.10
Black	0.30	0.34*	0.30	0.23	0.35***	0.23
Hispanic	0.04	0.03+	0.05	0.05	0.03*	0.05
Amer. Indian	0.00	0.00	0.00	0.00	0.00	0.00
Multiple ethnicities	0.04	0.03	0.04	0.04	0.03+	0.04
In-state residency	0.84	0.85	0.84	0.84	0.85	0.84
N	1920	2148	2148	1063	3005	3005

+ $p<.10$, * $p<.05$, ** $p<.01$, *** $p<.001$

Figure 1

Area of Common Support for PSM (Treatment=Need Aid in First Semester of Enrollment)

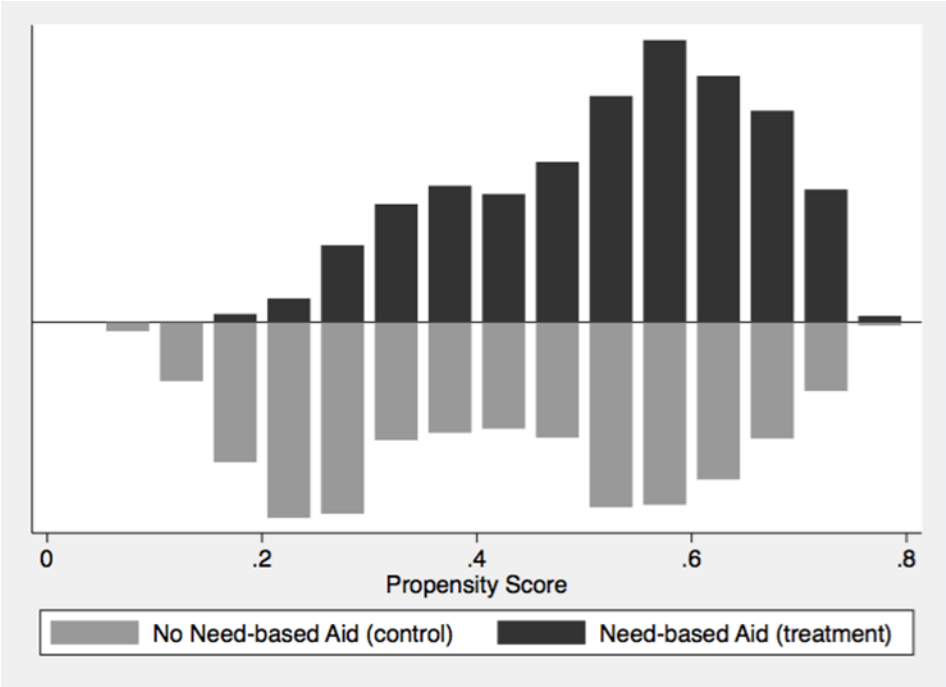
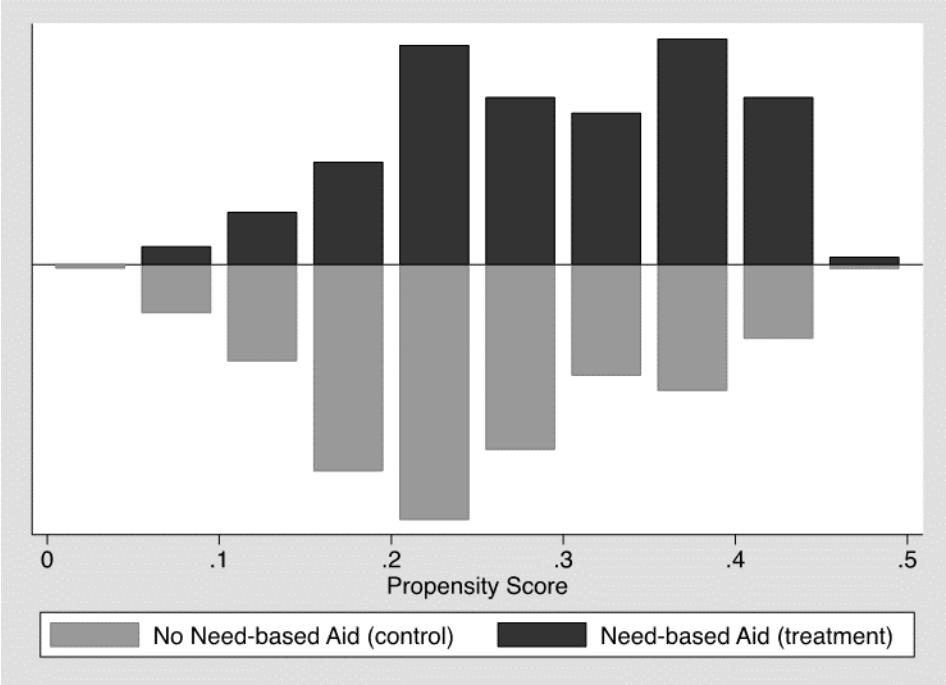


Figure 2

Area of Common Support for PSM (Treatment=Need Aid in Semester Prior to Possible Study Abroad)



Regression modeling. After weighting, probit regression models were used to predict the latent probability that a student would participate in study abroad, as shown in (3).

$$Y^* = \alpha + NeedAid\beta + Demographics\,\gamma + FinAid\,\delta + AcadChars\,\theta + u \quad (3)$$

In this model, the outcome is represented as Y^* on the left-hand side of the equation, while β corresponds to the predictor of interest, receipt of need-based grant aid. The remaining predictors on the right-hand side of (3) represent variable vectors that control for student demographic characteristics, financial aid amounts, and students' academic characteristics (see the second column in Table 1). These variables were selected based on our conceptual model and prior literature that examines student participation in study abroad, as described previously. Variables that change over time (e.g., GPA, financial aid amounts) represent their measures during the semester immediately prior to a student's possible study abroad participation. In these analyses, financial aid amounts were logged for analytic purposes to avoid undue influence from outliers, and regression coefficients were transformed to marginal effects.

For the sake of completeness, the model outlined in (3) was estimated eight times, four times for each treatment variable (need-based grant aid in the first semester of enrollment and need-based grant aid in the semester immediately prior to potential study abroad). The first two times did not include propensity weighting (naïve models), with one model including only the predictor of interest (receipt of need-based grant aid) and the other including control variables. The next two models were analogous to the first two but included propensity score weights (weighted models).

Robustness check. Although higher education administrators, policy-makers, and researchers may differentiate between need-based and non-need-based grant aid when making decisions surrounding policy and practice, from the student perspective, receipt of any grant aid, whether need- or non-need-based, may be enough to spur increased interest in participating in study abroad. To this end, we estimated additional models like the ones just described that took as the treatment variable receipt of any sort of grant aid, need- or non-need-based. The results of these models were similar to the ones presented in the following section. Because of this similarity in results and because the distinction between need- and non-need-based aid is important from a policy and practice perspective, especially when considering low-income students like those in this study, we do not discuss the results of these additional models further. However, results of these robustness checks are available from the authors upon request.

Model disaggregation. While the analyses just described provide insight into the role that receiving need-based grant aid may play in a student's subsequent decision to participate in study abroad, they do not demonstrate differences in the study abroad decision-making patterns among students receiving and not receiving need-based grant aid. To further examine how factors, including other types of financial aid, might operate differently for students receiving and not receiving need-based financial aid vis-à-vis study abroad participation, two additional regression models, taking the form of (4) were estimated, this time using data disaggregated by need-based grant aid status in the semester prior to possible study abroad.

$$Y^* = \alpha + Demographics\,\gamma + FinAid\,\delta + AcadChars\,\theta + u \quad (4)$$

This model is similar to that depicted in (3) but does not include need-based grant aid status on the right-hand side of the equation, as this variable was the basis for disaggregation. For the same reason, these disaggregated models do not include propensity score weights. Unfortunately, observations from students representing American Indian race/ethnicity backgrounds had to be dropped from these analyses (N=10) as nine of these ten students did not receive need-based grant aid in the semester immediately prior to potential study abroad, causing issues of multicollinearity in regression models.

After estimating these disaggregated regression models, individual linear coefficient contrasts (DeMaris, 2004) were calculated for all predictors to test for significant differences in how each variable related to study abroad participation for the two student groups. These contrasts were calculated as in (4)

$$t = \frac{b_j - b_k}{\sqrt{seb_j^2 + seb_k^2}}, \quad (4)$$

where b_j represents a model coefficient for students receiving need-based aid and b_k represents the coefficient corresponding to students not receiving need-based aid. The resulting statistic follows a t distribution with $n - (p + q) - 1$ degrees of freedom and is significant at the $\alpha < .05$ level when t is greater than 1.96 or less than -1.96 (DeMaris, 2004).

Results

Descriptive Statistics

Slightly less than half of students received need-based grant aid during their first term of enrollment at a USG institution (47%) while even fewer, 26%, received need-based grant aid in the semester immediately prior to their potential study abroad participation. Overall, approximately 33% of students participated in study abroad. Descriptive statistics for students disaggregated by need-based-grant-aid status are displayed in Table 3. Striking differences emerged between the need-based grant recipients and non-recipients. Specifically, over half of the students receiving need-based grant aid in their first semester studied abroad (56%) and a full 90% of those receiving need-based grant aid immediately prior to potential study abroad participated. Meanwhile, only 13% of students not receiving need-based grant aid in either semester studied abroad. Additional key differences between these two student groups concern students' financial resources. Specifically, students receiving need-based grant aid exhibited lower average levels of expected family contribution compared to their no-need-aid counterparts. These students also received higher amounts of average non-need-based grant aid. Need-based grant recipients exhibited higher average GPAs, likely qualifying them for merit-based aid accounted for in this category.

Table 3

Descriptive Statistics for All Students and Disaggregated by Need-based Aid Status

	First Semester		Semester Prior to Possible Study Abroad	
	Need Aid	No Need Aid	Need Aid	No Need Aid
Study Abroad	0.56	0.13	0.90	0.13
First-term Characteristics				
Approximate age	21.71	21.96	21.12	22.10
Exp. fam. contribution	1090.95	2039.54	1245.41	1714.37
Research institution	0.42	0.48	0.48	0.44
Demographic Characteristics				
Male	0.30	0.33	0.30	0.32
Asian	0.08	0.09	0.10	0.08
Black	0.30	0.34	0.23	0.35
Hispanic	0.04	0.03	0.05	0.03
American Indian	0.00	0.00	0.00	0.00
Multiple ethnicities	0.04	0.03	0.04	0.03
White	0.53	0.50	0.57	0.50
In-state residency	0.84	0.85	0.84	0.85
Financial Aid				
Non-need-based grants	893.94	341.68	1503.48	283.56
Subsidized loans	2738.47	2846.60	2791.99	2796.83
Unsubsidized loans	836.73	1080.28	794.44	1025.78
Academic Characteristics				
GPA	3.09	2.96	3.18	2.96
Major: Business	0.12	0.13	0.10	0.13
Major: Arts/Human.	0.17	0.14	0.21	0.14
Major: Social Science	0.13	0.11	0.13	0.12
Major: STEM	0.15	0.16	0.17	0.15
Major: Education	0.08	0.09	0.07	0.09
Major: Other	0.32	0.34	0.30	0.34
Freshman	0.17	0.18	0.16	0.18
Sophomore	0.31	0.31	0.30	0.31
Junior	0.31	0.32	0.33	0.31
Senior	0.21	0.20	0.22	0.20
N	1,920	2,148	1,063	3,005

Regression Results

Table 4 displays results of this study's regression analyses. The first group of models uses receipt of need-based grant aid in the first semester of enrollment as the treatment. The second group of models considers receipt of need-based grant aid in the semester prior to potential study abroad as the treatment. The first column in each set of models corresponds to a naïve model without propensity score weights or control variables depicting the relationship between the receipt of need-based grant aid and study abroad participation. The second column corresponds to a similarly unweighted model, but one that includes control variables. The third column represents a model that lacks control variables, but that does include propensity score weighting. The model summarized in the fourth column includes both propensity score weights and control variables.

As the results of the models displayed in Table 4 indicate, receiving need-based grant aid was consistently and significantly associated with an increase in the likelihood of participation in study abroad, a finding that was robust to the inclusion of control variables in the model and propensity score weighting. Marginal effects for the models considering receipt of need-based grant aid in a student's first semester of enrollment are consistently smaller than the marginal effects corresponding to receipt of need-based grant aid in the semester immediately prior to possible study abroad. Specifically, these findings estimate that students receiving need-based grant aid in their first semester of enrollment are between 43% (column 1) and 50% (column 4) more likely to study abroad. Students who receive need-based grant aid later in their studies, prior to a semester when they are likely to study abroad, are between 67% (column 6) and 77% (column 7) more likely to participate.

In the models containing control variables (columns 2, 4, 6, and 8), several significant findings emerged that were consistent across models. Specifically, male gender, Asian and Black races/ethnicities (compared to White students), in-state residency, and majoring in STEM, Education, or a field falling into the 'Other' category (compared to a Fine Arts or Humanities field) were significant at a standard level and negatively related to study abroad participation. Non-need-based grant aid presented a positive association with study abroad participation across models.

Table 4

Regression Results for All Students (Marginal Effects)

	Treatment: Need-based aid in first semester of enrollment				**Treatment: Need-based aid in semester prior to possible study abroad**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Naïve Model	Naïve Model with Controls	Weighted	Weighted with Controls	Naïve Model	Naïve Model with Controls	Weighted	Weighted with Controls
Need-based Aid	0.433***	0.460***	0.497***	0.495***	0.766***	0.668***	0.771***	0.707***
	(0.013)	(0.018)	(0.013)	(0.015)	(0.011)	(0.019)	(0.011)	(0.016)
Male		-0.048*		-0.033+		-0.060**		-0.056+
		(0.021)		(0.019)		(0.022)		(0.032)
Asian		-0.107***		-0.075*		-0.156***		-0.207***
		(0.031)		(0.031)		(0.028)		(0.054)
Black		-0.171***		-0.133***		-0.183***		-0.201***
		(0.020)		(0.018)		(0.021)		(0.038)
Hispanic		0.043		0.016		0.077		0.072
		(0.054)		(0.046)		(0.055)		(0.067)
American Indian		-0.103		-0.127*		-0.023		0.049
		(0.167)		(0.054)		(0.197)		(0.105)
Multiple races/ethnicities		-0.032		-0.004		-0.040		-0.005
		(0.047)		(0.044)		(0.051)		(0.059)
In-state residency		-0.079**		-0.064*		-0.065*		-0.095*
		(0.029)		(0.029)		(0.031)		(0.039)
Log Non-need Grant Aid		0.112***		0.094***		0.083***		0.070***
		(0.004)		(0.004)		(0.004)		(0.005)
Log Subsidized Loans		0.008**		0.006*		0.003		-0.003
		(0.003)		(0.003)		(0.003)		(0.004)

	Treatment: Need-based aid in first semester of enrollment				**Treatment: Need-based aid in semester prior to possible study abroad**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Naïve Model	Naïve Model with Controls	Weighted	Weighted with Controls	Naïve Model	Naïve Model with Controls	Weighted	Weighted with Controls
Log Unsub. Loans		-0.000		0.000		-0.001		-0.001
		(0.003)		(0.003)		(0.003)		(0.005)
Research institution		0.030		0.019		0.006		-0.013
		(0.022)		(0.021)		(0.023)		(0.032)
GPA		-0.050**		-0.042**		-0.026		-0.028
		(0.016)		(0.014)		(0.017)		(0.020)
Business		-0.109***		-0.092***		-0.045		-0.025
		(0.029)		(0.024)		(0.035)		(0.050)
Social Sciences		-0.087**		-0.086***		-0.023		-0.019
		(0.030)		(0.024)		(0.036)		(0.050)
STEM		-0.107***		-0.070*		-0.094**		-0.125*
		(0.029)		(0.028)		(0.031)		(0.052)
Education		-0.183***		-0.153***		-0.185***		-0.237***
		(0.024)		(0.020)		(0.027)		(0.058)
Other		-0.122***		-0.095***		-0.081**		-0.084*
		(0.025)		(0.023)		(0.028)		(0.039)
Freshman		-0.078*		-0.072*		-0.058+		-0.036
		(0.032)		(0.029)		(0.035)		(0.050)
Sophomore		-0.077**		-0.089***		-0.056*		-0.029
		(0.026)		(0.025)		(0.028)		(0.044)
Junior		-0.051*		-0.063*		-0.031		-0.025
		(0.026)		(0.025)		(0.027)		(0.043)
Sample Size	4068	4068	4068	4068	4068	4068	4068	4068
Chi-Square	895.19	2947.96	1059.70	1356.03	2127.01	3228.73	1549.13	1085.43
Pseudo R2	0.17	0.57	0.26	0.60	0.41	0.62	0.49	0.60

Standard errors in parentheses

Reference groups include: White (for race/ethnicity), Fine Arts/Humanities (for major), and Senior (for class standing)

+ $p<.10$, * $p<.05$, ** $p<.01$, *** $p<.00$

Disaggregated Models

Table 5 displays the results of models disaggregated by need-based-grant-aid-receipt status in the semester prior to when a student might have studied abroad. The final column in this table corresponds to the calculated t value for each pair of coefficients. Significant differences ($\alpha < .05; t > 1.96 \; or \; < -1.96$) emerged when comparing coefficients corresponding to multiple races/ethnicities, non-need-based grant aid amount, subsidized loan amount, and freshman and sophomore status (these values are bolded in Table 5). Concerning students with multiple race/ethnicity backgrounds, these results suggested that those receiving need-based grant aid were more likely to study abroad (a result that bordered on a standard significance level), while those that did not receive need-based grant aid were less likely to participate. While non-need-based grant aid positively related to study abroad participation among all students, this association was stronger for students not receiving need-based grant aid. Specifically, for students who did not receive need-based grant aid funding, a 10% increase in non-need-based grant aid was associated with an almost 4 percentage point increase in the likelihood of study abroad participation. Results for subsidized loan amount were similar, but with a much smaller percentage point increase in the likelihood of study abroad participation (i.e., less than 1%). Unsubsidized loans, on the other hand, did not present a significant result for either need-based-grant-aid group. Finally, students at earlier stages in their studies (Freshmen and Sophomores) were less likely to participate in study abroad only if they did not receive need-based grant aid in the semester immediately prior to the possibility of participation. Classification as a freshman was, in fact, positively associated with study abroad participation among the group of students receiving need-based grant aid.

Table 5

Regression Results for Disaggregated Sample (Marginal Effects) and Coefficient Contrasts

	(1)	(2)	(3)
	Need Aid	No Need Aid	Coefficient Contrast (calculaed t)
Male	-0.028	-0.030***	0.09
	(0.020)	(0.008)	
Asian	-0.087*	-0.041***	-1.03
	(0.044)	(0.008)	
Black	-0.076**	-0.062***	-0.49
	(0.027)	(0.009)	
Hispanic	-0.005	0.044	-0.92
	(0.044)	(0.030)	
Multiple races/ethnicities	0.055+	-0.029*	**2.72**
	(0.028)	(0.013)	
In-state residency	-0.041*	-0.011	-1.32
	(0.018)	(0.014)	
Log Non-need Grant Aid	0.005+	0.038***	**-7.78**
	(0.003)	(0.003)	
Log Subsidized Loans	-0.004+	0.004**	**-3.58**
	(0.002)	(0.001)	
Log Unsubsidized Loans	-0.002	-0.001	-0.32
	(0.003)	(0.001)	

	(1)	(2)	(3)
	Need Aid	No Need Aid	Coefficient Contrast (calculaed t)
Research institution	-0.026 (0.019)	0.007 (0.010)	-1.54
GPA	0.009 (0.017)	-0.009 (0.007)	0.98
Business	0.021 (0.028)	-0.014 (0.013)	1.13
Social Sciences	0.017 (0.027)	-0.008 (0.014)	0.82
STEM	-0.038 (0.034)	-0.016 (0.013)	-0.60
Education	-0.103+ (0.055)	-0.051*** (0.007)	-0.94
Other	-0.009 (0.026)	-0.021+ (0.012)	0.42
Freshman	0.053* (0.021)	-0.032** (0.011)	**3.59**
Sophomore	0.039+ (0.020)	-0.037*** (0.010)	**3.40**
Junior	0.012 (0.020)	-0.019+ (0.010)	1.39
Sample Size	1062	2996	
Chi-Square	70.10	1363.63	
Pseudo R2	0.10	0.58	

Standard errors in parentheses
Reference groups include: White (for race/ethnicity), Fine Arts/Humanities (for major), and Senior (for class standing)
+ $p<.10$, * $p<.05$, ** $p<.01$, *** $p<.001$

Limitations

Although researchers have long-identified socioeconomic status as a key driver of study abroad (non-)participation (e.g., Brux & Fry, 2010; Chieffo, 2001; Dessoff, 2006; Luo & Jamieson-Drake, 2015; McClure et al., 2010; Van Der Meid, 2003), this investigation is the first to consider study abroad participation specifically among low-income students. As such, it makes a considerable contribution to our understanding of study abroad participation among underrepresented student groups. However, as with any research, this study is not without its limitations. First, the dataset employed in this study represents a single state (Georgia) and a single institution type (those that comprise the USG, which are all public, four-year institutions). As such, the generalizability of the results presented here are somewhat limited in that the low-income students attending these institutions are likely not representative of low-income students in general. Indeed, prior research indicates that low-income students tend to concentrate in the two-year community college sector (e.g., González Canché, 2014), a sector not represented in the GLOSSARI dataset. Additionally, Georgia represents a state with a strong merit-aid program (Sjoquist & Winters, 2014), and consequently student decision-making happens within a unique financial aid context.

A second limitation is that, while the GLOSSARI dataset is ideal for this type of research in that it contains very detailed information regarding student finances, the inclusion of information such as students' attitudes towards multiculturalism, prior interactions with the world beyond U.S. borders, and levels of ethnocentricity are not among its strengths. These factors likely contribute to a student's decision-making surrounding study abroad (e.g., Carlson, Burn, Useem, & Yachimowicz, 1990; Goldstein & Kim, 2006; Luo & Jamieson-Drake, 2015; Miller, 2004). The inclusion of major field of study as a control variable in the current study may account for these student-level attitudes and interactions to an extent. Similarly, the GLOSSARI lacks some variables typically associated with a student's *habitus*, namely first-generation status and measures corresponding to access to information about college.

This study has two additional limitations specifically regarding its sample of low-income students. First, there are some potential limitations with the EFC variable itself that was used to create the sample. Many times, students with a low EFC amount on their FAFSA are selected for verification process, as mentioned above (Smith, 2018). We are limited with this dataset in that we do not know if the verification process is the reason why some students did not receive need-based financial aid, nor do we know if the EFC numbers were even verified by the college's financial aid office. Although the institutions themselves provided these EFC amounts, it is possible that they were not subjected to a verification process. A final limitation of this study relates to how low-income status was defined. For the purposes of this study, students were considered to be low-income using a $5,000 EFC threshold. EFC is calculated directly from parental income and other factors reported in the FAFSA, and it is likely that EFC is a fairly accurate representation of a student's income status. However, it is possible that some low-income students were omitted from this study due to missing FAFSA and EFC information. Therefore, this study is limited to low-income students who applied for financial aid using the FAFSA.

Discussion

Many prior studies have focused on the relationship between demographic and socioeconomic variables as they relate to students' participation in study abroad, but this study more clearly examines the role of need-based grant aid in study abroad choice decisions specifically among low-income students. Results indicated that low-income students who received need-based grant aid were more likely to study abroad compared to their low-income peers that do not have this financial resource. Specifically, the weighted models including control variables indicated that low-income students who received need-based grant aid were 50-71% more likely to study abroad. While this percent increase may at first glance appear to be large, it is not surprising when one considers the cost of study abroad and how much of that cost is offset by need-based grant aid. These results support initiatives both to ensure that low-income students who do qualify for need-based financial aid apply for it and to provide these students with information about how they can use this aid to study abroad. Need-based financial aid appears to play a significant role in providing low-income students with access to educational experiences such as study abroad.

Our results also speak to the relationship between other kinds of financial aid and study abroad participation, especially among students who did not receive need-based grant aid. Non-need-based grant aid was a positive, significant predictor of study abroad participation among low-income students in our aggregated models. In general, it appears that any form of grant aid is likely to increase study abroad participation among low-income students. However, our disaggregated models indicated that this positive relationship between non-need-based grant aid was only significant for students who did not receive need-based grant aid. This finding suggests a situation wherein low-income students who do not receive need-based grant aid must supplement with some other form of financial aid in order to participate in educational activities that are more easily accessed by their higher-income peers, such as study abroad.

This interpretation is reinforced when considering findings for student loans. That is, results of our aggregated models suggested that unsubsidized loans were not significantly related to study abroad participation and that subsidized loans had a very small positive relationship with study abroad (less than 1%). However, disaggregated models indicated that this latter finding held only for low-income students who did not receive need-based grant aid. In other words, this student group might incur additional loan debt in order to access education abroad when they do not receive need-based financial aid that helps them pay for these experiences. These findings surrounding loan aid are in contrast to prior literature (Salisbury et al., 2010; Whatley, 2017), which found that loans were negatively related to study abroad participation. These conflicting findings are possibly related to the focus of the current study on low-income rather than all students. That is, low-income students come from backgrounds that are different from those of their higher-income peers, potentially altering their perspective of financial aid and the ways in which they react to it. Higher-income students might choose not to participate in study abroad to avoid taking on additional loan debt, while this is less of a concern for lower-income students, who may already have substantial student loan debt. This situation might be especially applicable for low-income students who do not receive other types of financial support.

In addition to findings surrounding financial aid, our results indicated that several low-income populations are less likely to study abroad holding constant their need-based-grant-aid status. Aligned with the literature, male students in our study were less likely to study abroad (e.g., Lucas, 2009). Additionally, majoring in STEM or Education was negatively related to study abroad participation. Universities might consider ways to encourage more male participation in study abroad, such as through targeted promotional materials (Lucas, 2009), and how to integrate study abroad opportunities more seamlessly into certain degree programs. STEM and Education majors often have practicum, internship, or co-operative education requirements, which could potentially hinder participation in study abroad (Niehaus & Inkelas, 2016).

The overall results from this study inform our conceptual model surrounding study abroad choice among low-income students. We found that for students from families with lower financial resources, the receipt of need-based grant aid and non-need-based grant aid are significant positive predictors of study abroad choice. Moreover, these students appear to react to student loan aid in ways that are different from their higher-income peers vis-à-vis study abroad participation. We further find some evidence to suggest that gender and race/ethnicity are significantly related to study abroad choice, as our conceptual model suggests. The higher education context also appeared to play some role in students' study abroad choice behaviors, as low-income students from some majors were less likely to engage in study abroad. Institutions have an opportunity to market and recruit students for study abroad opportunities and can encourage more low-income students to participate by offsetting the expected costs. More work is needed to examine other layers of our conceptual model, such as the broader higher education policy context, to reach a better understanding of the role that families, communities, and the social, economic, and policy contexts play in low-income students' study abroad choice behaviors.

Overall, the main finding of this study is the positive significant relationship between receipt of need-based grant aid and study abroad participation among this group of low-income students. Significantly reducing the costs associated with postsecondary education seems to be associated with increased participation in specialized educational activities such as study abroad. Participation in education abroad may be particularly important for low-income students as they may benefit disproportionally from the increases in self-efficacy, expansions in social relationships, and improvements in post-graduation labor market outcomes associated with international experiences. That is, while higher-income students likely have opportunities to travel internationally beyond study abroad, international experience is likely most accessible to low-income students through a study abroad program at their university. It is important that, in addition to providing need-based aid to support students in postsecondary education broadly, institutions also

consider the role of need-based aid in making the benefits of education abroad a realistic opportunity for all students, regardless of income level.

Conclusion

This study extended the literature on access to study abroad by examining the relationship between need-based grant aid and participation in education abroad among low-income students. While prior research has indicated that financial resources are a key driver of student decision-making concerning study abroad, this study represents the first to examine data from low-income students specifically. Overall, this study found a positive, significant relationship between need-based grant aid and participation in study abroad among low-income students. The findings from this study have implications for both future research and practice.

Additional research is needed to further examine the relationship between financial aid and study abroad participation, especially among low-income students. Researchers should consider using a federal dataset that captures study abroad participation among students nationwide rather than in a single state, such as Baccalaureate and Beyond, to investigate the relationships between types of financial aid (e.g. loans, grants, scholarships, etc.) and study abroad participation. While this study focused on the receipt of need-based grant aid broadly, future studies should examine the effects of scholarship programs that are available specifically for study abroad participation. A useful future study would explore study abroad programs that offer additional financial assistance to low-income students and whether this aid increases participation rates among this student population. Such a study might also investigate best practices for distributing study abroad financial aid to low-income students. Finally, while this paper focused on low-income students, future studies should also focus on study abroad participation of other underserved groups such as first-generation students and community college students, student populations that are often, but not exclusively, comprised of low-income students.

Nexus: Connecting Research to Practice

- Key actors at post-secondary institutions should consider not only access to college, but also access to important educational opportunities once in college. While improvements have been made to close enrollment gaps, low-income students are less likely to participate in many specialized educational opportunities, such as study abroad. If global citizenship and engagement represent institutional priorities, then it is important that key actors work to ensure that all students, regardless of financial need status, have access to education abroad. In the case of this study, these key actors include administrators and advisors, who make decisions about financial aid specifically for study abroad and who advocate for study abroad at the broader institutional level. This group of individuals also includes financial aid officers and other officials working with financial aid, who make decisions surrounding how scarce financial resources are allocated among students at the broader institutional level.
- To increase access, institutions may consider establishing robust, need-based scholarships for study abroad that are directed specifically at low-income students. Such scholarships could be automatically distributed to low-income students along with other forms of financial aid, meaning that their availability would be clear to students when they access their student accounts. This type of action would require coordination and communication between an institution's financial aid office and the office on campus that coordinates study abroad. Much of this collaboration could be done electronically by linking students' financial accounts in both units.
- A particularly cost-effective way to encourage education abroad among low-income students would be to cover the costs of applying for a passport (e.g., the University of North Carolina's *Passport to GO!* program), which often represents the first financial barrier that low-income students encounter when considering study abroad.

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