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Financial Aid Packaging at Community Colleges: Which types of awards packages increase student persistence?

Cover Page Footnote

This manuscript was completed in partial fulfillment of the Ph.D. requirements in Higher Education Leadership and Policy Studies at the University of Houston, under the direction of Lyle McKinney, Ph.D., Andrea Burrige, Ph.D., Catherine Horn, Ph.D. & Sara Jones, Ph.D.

Financial Aid Packaging at Community Colleges: Which Type of Award Packages Increase Student Persistence?

By: Maria Luna-Torres, Lyle McKinney, Andrea Backscheider Burridge, Catherine Horn, and Sara J. Jones

Increasing college costs, coupled with decreasing financial aid has raised public concerns over the affordability of higher education. For the past four decades, the nation has seen the cost of tuition rise at levels that exceed inflation, and financial assistance rates that have not kept pace with that growth. Studies suggest that these financial resources play a role in influencing college attendance decisions and persistence for low-income students. This study examines the characteristics of zero-EFC students as compared to non-zero EFC students and determines the extent to which a gift-aid only, and gift-aid plus loans awards package affects the likelihood of persistence. Also, it explores the relationship between the ratio of loans-to-gift-aid, and the likelihood of persistence across income levels.

By employing logistic regression, this study aims to determine if there are differential effects among financial aid award packages, and if the ratio of a loans-to-gift-aid package affects persistence by income status. Results demonstrated that a gift-aid only package, and a gift-aid plus loans package negatively influenced the enrollment outcomes of zero-EFC students and positively influenced the enrollment outcomes of high-income students. Additionally, when examining the ratio of loans-to-gift-aid for students with a gift-aid and loans package, results showed that the higher the ratio of loans to gift-aid, the higher the likelihood of persistence for all income levels.

In an era where the rising costs of a college education are becoming more difficult to cover with present levels of financial aid, earning a higher education credential is possible if students are willing to take on educational debt. A comprehensive higher education plan that acknowledges financial barriers as fundamental obstacles to the college success of the lowest income students is necessary to preserving equal opportunity to upward social mobility.

Keywords: *Financial aid packaging, community colleges, persistence*

Increasing college costs, coupled with decreasing financial aid, has raised public concerns over the affordability of higher education. For the past four decades, the nation has seen the cost of tuition rise at levels that exceed inflation, and financial assistance rates that have not kept pace with that growth (College

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Board, 2017a). This phenomenon limits the opportunities of many students and families to obtain a higher education. Research shows that finances can have an impact on both students' decisions about whether they pursue a higher education (McDonough & Calderone, 2006; Perna, 2000; St. John, Paulsen, & Carter, 2005), and their ability to complete college (Chen, 2008; Cofer & Somers, 2001; Pascarella & Terenzini, 2005; St. John & Starkey, 1994).

Postsecondary access and completion for low-income students certainly merit the attention of the higher education community, but it is an especially pressing concern for the community college sector. About 40% of students served by the community college are Pell Grant-recipients which means that they are low-income (AACC, 2016). For low-income students in particular, financial assistance is essential as they are often unable to attend college otherwise. While the Pell grant may cover most of the tuition costs at a community college, tuition costs represent only about 20% of student's full cost of attendance; Consequently, students are left to find other sources to cover the remaining 80% of their college costs, including housing, books and supplies, and other expenses (AACC, 2016). Not surprisingly, with limited state aid support (Laderman & Carlson, 2017) coupled with the Pell Grant's limited purchasing power, the need to resort to the use of student loans at the community college sector has grown.

Indeed, federal student loans in combination with Pell grants and state aid has the potential to help students cover more of their college costs. However, borrowing can pose a risk for community college students who are more prone to repayment hardship and default (Campbell & Hillman, 2015; McKinney & Burridge, 2015). Additionally, studies suggest that both federal and state aid financial resources play a role in influencing college attendance decisions and persistence for low-income students (McDonough & Calderone, 2006; Perna, 2000; St. John, Paulsen, & Carter, 2005). The crux of the issue is figuring out which is the optimal financial aid package in order for low-income students to persist and graduate from college, thereby helping create more efficient use of limited state and federal resources.

Financial Aid Packaging

Postsecondary institutions distribute financial aid to students based on their financial aid packaging philosophies. By following federal and state aid program guidelines, financial aid administrators assemble a student's financial aid awards package. Within program guidelines, institutions have discretion over how they distribute aid and proportions they can award in gift-aid (e.g. grants, scholarships) versus self-help aid (e.g. loans, work-study) [Federal Student Aid, 2016]. Research suggests that institutional financial aid packaging philosophies are typically more mechanically-driven rather than grounded on theory (Olivas, 1985). In other words, financial aid awarding many times occurs on a first come-first serve basis for eligible students. A more intentional approach would be to base aid awards for eligible students on degree of need, and not on whether they applied first or last.

Further, studies show mixed results including both positive (Mendoza, Mendez & Malcolm, 2009; Stampen & Cabrera, 1988; St. John, Hu, & Tuttle, 2000; Murdock, 1989) and negative (DesJardins & McCall, 2010; Dowd & Coury, 2006; Fenske, Porter & Dubrock, 1999) effects on enrollment outcomes when packaging gift-aid with self-help aid. Also, there is evidence that institutions have experimented with the timing of financial aid packages (DesJardins & McCall, 2010; Lips, 2011). Particularly, four-year institutions have intentionally chosen to provide students with more favorable types of aid in the first college year in order to attract high-achieving students to their institutions (DesJardins & McCall, 2010). Higher-priced selective institutions have specifically experimented with debt-free award packages in an effort to attract high achieving, low-income students (Lips, 2011). However, literature on financial aid packages that specifically help average, low-income students persist, is scarce. Considering that community colleges hold almost half of the undergraduate enrollments (AACC, 2016), more information regarding which aid is most effective for helping these students achieve favorable enrollment outcomes is necessary.

Since low-income students are unable to derive and meet all their financial need from one source of aid, it is important that institutions understand the unique contributions as well as the combined impact that the different types of aid have on students' persistence and enrollment outcomes. Data by the NCES (2014), shows the overall six-year completion rate at 19.5% for students seeking a certificate or degree at a two-year public institution. This low rate coupled with the fact that community colleges also hold the highest default rate at 19.1% (FSA, 2016) calls for greater attention to how financial aid packages are assembled, especially for low-income students whose stakes are greatest if they do not complete a degree. They could end up incurring unmanageable debt loads. Literature shows that students who do not complete a degree are more likely to default on their student loans (Gladieux & Perna, 2005; Nguyen, 2012). Therefore, the way in which institutions package financial aid matters particularly for low-income students considering their already financially distressed situation.

Purpose and Research Questions

Towards that end, this study explored the differential effects of financial aid on enrollment outcomes of students by income status. While research abounds on the effects of financial aid on the persistence of students at four-year institutions, literature pertaining to specifically the relationship between persistence and financial aid award packages at the community college sector is relatively limited. Therefore, this study intended to fill this gap in the literature by examining the effects that federal grant aid, state need-based grants, and federal student loans, have on the enrollment outcomes of community college students with varying income statuses. Specifically, this study examined if gift-aid (e.g. Pell Grant, Federal Supplemental Educational Opportunity Grant, Texas Grant, Texas Educational Opportunity Grant, and scholarships), and Federal Subsidized and Unsubsidized Student Loans, in combination or alone, positively or negatively affect the enrollment outcomes of the lowest-income students at a large urban community college system in Texas.

The research questions that this study will answer are as follows: 1) What are the characteristics of zero-EFC students as compared to non-zero-EFC students at a large urban community college district? (a) Are there significant differences in background characteristics, academic preparation, gift-aid and federal student loan use? 2) For students with financial aid packages with gift-aid only, and gift-aid and loans, to what extent do these combination types affect the likelihood of persistence from the first year of enrollment to the second year by income status? 3) For students with a financial aid package consisting of gift-aid and loans, what is the relationship between the ratio of loans-to-gift-aid, and the likelihood of persistence from the first year of enrollment to the second year by income status?

Review of Literature

This section reviews existing research related to financial aid and student persistence. To gain an understanding about the implications of financial aid packaging on student persistence, the first section reviews studies pertaining to the effects of various financial aid combinations on students' enrollment outcomes. Also, it particularly draws from the literature on four-year institutions due to the limited number of studies available on community colleges. Considering the growing use of student loans by community college students, the second section reviews studies pertaining to the literature about the impact of federal student loans on community college students' persistence and enrollment outcomes.

Effects of Financial Aid Packaging on Persistence

The extant literature shows that the way in which financial aid is packaged definitely affects the enrollment outcomes of students. Studies also point to differences in financial aid impact across a student's socioeconomic status and academic achievement. Additionally, the timing of the financial aid package also appears to be a mediating factor in how financial aid types affect student persistence.

DesJardins and McCall (2010) found that when comparing four-year university students with financial aid packages, against students with no financial aid, students under the no-aid scenario had a higher likelihood of stop out and lower completion. Further, this study also experimented with frontloading gift-aid (e.g. grants and scholarships). Frontloading refers to providing only gift-aid (no loans) to students in the first two years of college (Breneman & Galloway, 1996). The authors found that frontloading grant aid, versus spreading the same amount of grant aid across terms, increased stop outs and reduced chances of graduation. Further, in simulating the effects of substituting loans with gift-aid, DesJardins and McCall (2010) found that a no-loans financial aid package improves overall chances of graduation.

Similarly, Smith (2010) examined a sample of 2,280 African-American students at a four-year public university using the Beginning Postsecondary Students Longitudinal Study (BPS), 2004-2006. By comparing non-financial aid recipients with recipients of financial aid packages consisting of either grants only, or grants and loans, Smith found no significant impact on a student's persistence in the first year. The study does not identify whether the types of aid included in the aid package are federal or state grants. Also, interpretation of the results should consider that the sample used in this study consists of only African-American students. Literature does point to race/ethnicity as playing a role in a student's decisions about the types of financial aid they are willing to take so the results could be different depending on a student's ethnicity/race (Cunningham & Santiago, 2008).

Additionally, Fenske, Porter, and Dubrock (1999) studied four freshman cohorts of underrepresented minority students in science, engineering and math (SEM) fields at a large four-year public research university in a metropolitan area. Overall, findings suggest that there was a positive association between gift-aid only financial aid packages, and persistence of SEM majors from year to year. In contrast, gift-aid and self-help (e.g student loans, college-work study) financial aid packages had a negative association with persistence in moving from the second to the third year. In line with other studies (DesJardin and McCall, 2010; Smith, 2010) they found self-help only packages to have a negative association with first-to-second year persistence.

Further, tuition costs and state funding appear to have an impact on the effects of financial aid packages on persistence. St. John, Hu, and Tuttle (2000) examined the financial aid packaging effects of grant and loan combinations, on with-in-year-persistence of low-income students at an urban four-year public university. In comparison with no-aid students, they found that significant positive effects during the first years disappeared by the fourth year. Authors point to a stagnant Pell grant, and tuition and state grant increases over the course of the study as external factors influencing financial aid value. State grants in this case appeared to mitigate the Pell grant's diminishing purchasing power.

In light of increasing tuition costs coupled with limited state funding, insights pertaining to whether financial aid awards are equitably distributed is critical to improving student enrollment outcomes. Stampen and Cabrera (1988) offer some insight into this phenomenon. They examined a three-year longitudinal sample of 10,200 freshman students beginning in the Fall semester at a public four-year university system. The contributions of this study were unique in that they tested for equity in the distribution of financial aid, consisting of both federal grants and student loans; they found that the lowest income students with aid have same attrition rate as non-aided students in the highest income bracket (Stampen & Cabrera, 1988). These findings reveal that considering income status in the determination of financial aid award types contributes towards creating an equitable financial aid distribution system. In this study, financial aid helped level the field between low-income students and higher income students.

Also taking income status into consideration, Nichols (1980) examined 360, full-time, junior college students to determine the relationship between financial aid package and socioeconomic status on academic achievement (e.g. GPA). He found that a robust financial aid package (including federal and state grants,

plus a federal student loan) for a low-income student yields a GPA that is only slightly lower than that of a similar high-income student having only an academic scholarship. These findings highlight wealth disparities which account for low-income students' dependence on financial aid as opposed to wealthier students who have more financial resources.

Similar to Nichols (1980), Coria and Hoffman (2016) used academic achievement (e.g. GPA and academic hours completed) as the outcome variable of interest as opposed to using access or persistence to test for the effects of financial aid packages on a student's progress. Coria and Hoffman (2016) examined a sample of urban community college students and found that financial aid awards for low-income students (e.g. financial aid recipients) offset the effects of being low-income on academic performance to a certain extent. The authors found that when comparing financial aid recipients to non-financial aid recipients (e.g. high-income students), there is a tipping point where low-income students stop experiencing the positive effects of the financial aid on their academic achievement. In this study, authors suggest that the tipping point (e.g. \$115 financial aid/ unit completed) is the point at which aid received does not make up for a student's higher unmet need. This study however does not account for ethnicity/race, academic preparation, nor does it distinguish between financial aid grant types or account for student loan use.

Further insight regarding the effects of financial aid packages on enrollment outcomes is provided by Murdock's (1989) meta-analysis which demonstrated that a combination, versus, a single form, of aid has a positive effect on persistence. However, he points to effects possibly being influenced by multiple aid forms yielding a greater amount of total aid, and not so much due to aid type. Also, effect sizes could be confounded not only by dollar amount of financial aid package but also by a student's academic ability. Notably, the meta-analysis revealed that financial aid appears to have a greater impact for community college students than four-year institutions' students. Finding could be attributed to the greater proportion of low-income students dependent on financial aid at community colleges versus students at four-year institutions (Community College Research Center, n.d.).

Impact of Loans on Student Persistence and Enrollment Outcomes

Studies conducted by The Institute for College Access and Success demonstrate that federal student loans can serve as a viable option and mechanism for expanding college access for underrepresented, low-income populations (Cochrane & Szabo-Kubitz, 2014). However, further research is necessary to determine if adding loans to a student's package improves student's enrollment outcomes. Using a sample of 18-to-22-year-old community college students from the NPSAS of 1987, St. John and Starkey (1994) studied the effects of loans and grants, and tuition costs on persistence. They found that loans did not have an effect on persistence while grants had a negative association. Taking a sample from the same database and year, Hippensteel, St. John, and Starkey (1996) studied community college students over the age of 23 and found that loans had a negative association with persistence, but the significant effect disappeared when tuition costs were taken into account. Authors attributed the negative association to the loans and grants not making up for the increases in tuition costs.

In another study, Dowd and Coury (2006) studied community college students' loans effects on both persistence and attainment of an associate's degree. In reviewing the BPS, 1990-1994, they found student loans had a negative effect on persistence and no form of financial aid, inclusive of loans, had an effect on associate's degree attainment. In a more recent and similar study, McKinney and Burrige (2015) controlled for self-selection bias and found loans to have a negative effect on persistence three and six years after students' initial enrollment. The authors attributed student borrowers' academic progress as influencing their confidence level on whether borrowing money would actually lead to positive returns.

Furthermore, Mendoza, Mendez and Malcolm (2009) examined a longitudinal, student-level dataset dating from 2002-2004 of full-time, first- and second-year students from Oklahoma's community colleges. They studied the effects of different combinations of financial aid inclusive of Pell Grants, Stafford Loans and state aid, on persistence. The results showed that student loans in combination with other aid had a positive effect on the persistence of community college students, but these effects are moderated by ethnicity and income. For instance, White students with Pell Grant and student loans were less likely to persist than African-American students who received neither of these types of aid. The authors suggest that income might play a role in outcome differences between the two ethnic groups.

In summary, the literature points to numerous factors which could impact the effects of financial aid packaging on persistence. Background characteristics of the student such as ethnicity/race, socioeconomic status, and academic preparation appear to mediate whether financial aid types help students persist. Further, the literature suggests that financial aid types coupled with amount of aid could account for differences in effect size among the various persistence studies. Additionally, evidence exists that tuition costs and state aid funding affect the persistence of low-income students more so than for higher income students who are less price sensitive. Finally, studies suggest that timing of the financial aid affects a student's persistence. Therefore, it matters to enrollment outcomes what types of aid, how much aid, and when aid is provided to students.

Conceptual Framework

Chen's (2008) heterogeneous research model on financial aid and student dropout in higher education served as the conceptual framework for the present study. While other models such as Tinto's student attrition model also aim to provide a framework for student dropout behavior, Tinto's model addresses primarily the social and academic factors affecting student departure for a more traditional-age student attending a four-year institution (Bean, 1981; Tinto, 1975). In contrast, Chen's model takes a more nuanced approach and recognizes a multitude of factors, beyond academic and social aspects, that can influence students' departure behavior.

Chen's model emphasizes socioeconomic and racial/ethnic differences as factors that should also be examined when studying student departure behavior. Furthermore, Chen points to studying financial aid factors across income and racial/ethnic groups versus on the general student population. Chen's approach to student departure borrows constructs from not only economic theories, but also theoretical frameworks from other disciplines, to allow for a holistic integrated approach to studying student departure. Frameworks and theories from other disciplines include self-efficacy theory (psychological), social-cultural capital model (sociological), Price's model of employee turnover (organizational), and Tinto's student attrition (interactionist) theory. Drawing from these different theories, Chen's integrated model suggests the inclusion of eight factors for studying student departure. These eight factors include student background characteristics, educational aspiration, pre-college preparation, financial factors, college experience, organizational effects, time and interaction effects (Chen, 2008). Chen's framework lends itself to the present study's objective which was to evaluate the differential effects of financial aid types on the enrollment outcomes of a particularly ethnically diverse, and economically vulnerable student population in a two-year college setting.

Methodology

Data Source and Sample

The data used in this study were derived from longitudinal student unit records from a large urban community college district in Texas. Metropolitan Community College (MCC), a pseudonym, is located in a

large urban area in the state and serves more than 70,000 students annually. Representing diverse racial/ethnic backgrounds, more than half of the student population's background is Hispanic or African-American, and MCC students are primarily of low-socioeconomic status. Less than half of MCC's first-time, full-time, fall 2007 cohort persisted through the second year of enrollment with a 41.8% two-year persistence rate. Also, MCC's three-year graduation rate for the Fall 2007 cohort was 11.9% and the six-year rate was 33% (THECB, 2017).

The dataset includes six academic years of data for a cohort of students starting in fall 2007 and tracks their enrollment through summer 2013. Student transcripts and financial aid records were examined for all first-time in college (FTIC) students filing a FAFSA and belonging to any of the following racial/ethnic groups—African American, Hispanic, White, and Asian. The full sample ($n = 2961$) was divided into three subsamples—1) students with a zero EFC, ($n=2,044$), 2) students with an EFC of \$1 thru \$2100, ($n=420$), and 3) students with an EFC of greater than \$2,100 ($n=497$). Considering that EFC is a federal measure of students' financial strength and is used to determine students' eligibility for federal student aid, this measure is an appropriate metric to differentiate between lower income and higher income students (Federal Student Aid, n.d.). Further, based on federal financial aid eligibility criteria, students with a zero EFC are considered the most economically disadvantaged students as they are granted the maximum Pell Grant award. Thus, this study uses EFC as a proxy for socioeconomic status. Zero-EFC students are categorized as the lowest income students living in poverty as suggested by Davidson (2013) and Romano and Millard (2006). Also, this study employed the student's EFC results from their first year in college. Research shows that EFC remains stable from one year to the next (Kelchen, 2015).

In addition to the zero-EFC group, two additional subsamples were created to serve as a comparison group to the zero-EFC group. The EFC ranges and cut-off points for the two additional groups were created based on the EFC range that corresponds to students who were eligible for Pell Grant during the 2008 award year. In 2008, students with a zero EFC received the maximum Pell Grant award (e.g. \$4,310) as they were considered the lowest income students (Federal Student Aid, 2007). Students with a \$2,100 EFC received 50% of the maximum Pell Grant amount for that award year (FSA, 2007). Therefore, \$2,100 which is the mid-range of the Pell Grant eligibility scale was used to create the cut-off for the second and third subsamples. The second subsample includes students who had EFC's between \$1 and \$2,100, which for purposes of this study represent the low-income category. The third subsample represents students who had EFCs above \$2,100, which for purposes of this study represent the higher income category.

To crosscheck the differences in income status across the three subsamples created, the adjusted gross income of the students within each category were examined and compared against federal poverty guidelines for 2008. The first subsample of zero-EFC students had a mean income of \$7,163 which according to 2008 poverty guidelines is considered below poverty level (Department of Health and Human Services, 2008). The second EFC group (e.g. \$1-\$2,100) had a mean income of \$30,841 which is 50% above poverty guidelines (DHHS, 2008). The third group (e.g. above \$2,100 EFC) are students whose mean income of \$63,881 corresponds to thresholds of approximately 150% above federal poverty level (DHHS, 2008).

Variables

As suggested by Chen's (2008) framework, the independent variables for this study were categorized into background characteristics, pre-college preparation, educational aspiration, college experience, and financial aid. These variables include students' sex, race/ethnicity, high school diploma earned, program of study, developmental coursework needs, program of study, enrollment intensity, GPA, and financial aid use. The coding for each variable is summarized in Table 1.

Table 1

List of variables and coding scheme

Variables	Coding Scheme
Predictors	
Race Black	Black = 0; White = 1
Race Asian	Asian = 0; White = 1
Race Hispanics	Hispanic = 0; White = 1
Sex	1 = male; 0 = female
High school diploma/GED	1 = GED/other; 0 = hs diploma
Developmental courses	Student referred to any developmental education course? 1=No; 0=Yes
Full or Part-time status	1 = 12 or more hours; 0 = less than 12 hours; As of first semester enrolled
GPA	Continuous measure as of first semester
Program of study:	
Certificate	Seeking certificate? 1=Yes; 0=No
Transfer Programs	Seeking program intended for transfer? 1=Yes; 0=No
Workforce associates	Seeking workforce-related associates? 1=Yes; 0=No
Financial aid combinations	1=gift-aid; 0=gift-aid and loans
Financial aid ratio	Continuous measure of loans to gift-aid ratio
EFC_3 groups	1=0 EFC; 2=\$1-\$2,100 EFC; 3=>\$2,101 EFC
Outcome Variable	
Persist to the second year	Persist from Fall 2007 to Fall 2008? 1=Yes; 0=No

Note: “1’s” are the reference group for every variable

Financial aid. The financial aid combination variable describes students use of the different financial aid types. Aid types include Federal Pell Grant, Federal Supplemental Educational Opportunity Grant (FSEOG), state grants consisting of Texas Grant and/or Texas Educational Opportunity Grant (TEOG), scholarships, and federal subsidized and/or unsubsidized student loans. The financial aid combination variable accounts for aid the student received in 2008 which is the first year of enrollment. The 2008 academic year includes fall 2007, spring 2008, and summer 2008. This variable is coded as a categorical variable with “1”

representing students who received gift-aid only which includes Federal Pell Grant, FSEOG, state grants, and scholarships, and “2” representing students who received gift-aid plus federal loans, which consists of students who received a combination of gift-aid (e.g. Pell Grant, FSEOG, state grants, scholarships), and also received federal subsidized/unsubsidized student loans. Gift-aid recipients represent the reference group.

Additional independent variables included a variable for total federal loan amount and a separate variable for total gift-aid amount. Both of these variables are continuous. The total federal loan amount represents the amount of total federal subsidized and unsubsidized loans that the student received in the 2008 award year. The total gift-aid variable represents the total amount of Pell Grant, FSEOG, state grants, and scholarships that the student received in the 2008 award year.

Another independent variable that was created was the financial aid ratio. Studies point to amount of aid type as an influencer in a student’s persistence (Coria & Hoffman, 2016; St. John, Hu, & Tuttle, 2000) with particular differential effects between gift-aid and loans (DesJardins & McCall, 2010). Therefore, this variable was derived as a continuous variable representing the ratio of loans-to-gift-aid that the student received in the first year. This ratio was computed by adding the 2008 total amount of federal subsidized/unsubsidized loans and dividing it by the total amount of Pell Grant, FSEOG, state grants, and scholarships for the 2008 award year.

Income status. A categorical variable, EFC groups, was created to represent three income levels. Students having a zero-EFC were coded as “1” and served as the reference group. The zero-EFC students represent students in poverty for purposes of this study. Low-income students were coded as “2” and they represent students having an EFC of \$1 thru \$2,100. The high-income group was coded as “3” and they consist of students having an EFC greater than \$2,100.

Outcome variable. The outcome variable of interest for the present study focuses on understanding the effects of the financial aid combination, and ratio on the enrollment outcomes of the lowest income students as compared to the higher income students. Specifically, this outcome measure assesses the effects of the aid award package, moderated by income status, on the likelihood of persistence in the first year of enrollment. Given the dichotomous nature of persistence, this dependent variable is coded as either 1) yes, student persisted from Fall 2007 to Fall 2008, or 2) no, student did not persist from Fall 2007 and Fall 2008.

Data Analysis

Descriptive and inferential statistics were used to answer the research questions. For the first research question, frequencies and percentages were used to show proportional distributions of the predictor variables. Specifically, a Chi-square test was applied among the three samples to determine whether proportional differences exist between students’ background characteristics, educational aspiration, academic preparation, financial aid, and college experience. This method allowed the researcher to uncover significant differences among the predictor variables for the three subsamples of interest.

Second research question. In the second phase of the analysis, logistic regression with a block-entry approach was used to determine the likelihood of persistence from Fall 2007 to Fall 2008. The ultimate objective was to determine the likelihood of each student’s membership in one of two events (e.g. persisted or dropout). Therefore, logistic regression was an appropriate method as the outcome of interest is dichotomous in nature (Meyers, Gamst, & Guarino, 2013). The student’s sex, race/ethnicity, academic preparation, enrollment intensity, GPA, program of study, federal student loan sum, and gift-aid sum were entered in block 1 of the regression model. Additionally, to test whether the effects of the financial aid combination on the likelihood of persistence were moderated by a student’s income status, the financial aid

combination type, EFC group, and the interaction term between EFC group and financial aid combination type were added in block 2 of the regression analysis.

Third research question. An additional regression model was built to determine if the ratio of loans-to-gift-aid influenced the likelihood of persistence from the Fall 2007 to Fall 2008. The loans-to-gift-aid ratio was centered to the mean to facilitate interpretation of the interaction term (Meyers, Gamst, & Guarino, 2013). The mean of the ratio serves as a reference point when examining the loans-to-gift aid ratio for the sample. The student’s sex, race/ethnicity, academic preparation, enrollment intensity, GPA, program of study, federal student loan amount, and gift-aid amount were entered in block 1 of the regression model. To test whether the effects of the loans-to-gift-aid ratio on the likelihood of persistence were moderated by a student’s income status, the loans-to-gift-aid ratio, EFC group, and the interaction term between EFC group and ratio of loans-to-gift-aid were entered in block 2 of the regression analysis.

Limitations

There are limitations to this study that could affect the results. Self-selection bias could influence the outcomes of this study. The full sample includes students who applied for financial aid because the goal was to understand the relationship between receiving different aid types and persistence. As the literature suggests, many low-income students do not apply for financial aid because they fail to complete the FAFSA (McKinney & Novak, 2012). Results from this study should be interpreted within that context, as the demographic and academic factors that influence persistence may be different for FAFSA filers, compared to non-filers. It is possible that students who completed the financial aid application process are students who possess other non-cognitive strengths (e.g. greater self-efficacy, grit) which are not accounted for in this study but could influence enrollment outcomes.

Results

Overall descriptive statistics were examined for the study’s predictor variables. Table 2 presents the sample size, mean, standard deviation and minimum and maximum values for GPA, loan sum, gift-aid sum, and the loans-to-gift-aid ratio. Results show that the average loans-to-gift-aid ratio was 1.46 with a standard deviation of 2.12 for the 417 students who had received a gift-aid plus loans awards package. In other words, students on average had \$1.46 in loans for every \$1 in gift-aid. The ratio ranged between 0 and 27.4 suggesting that the student with the lowest ratio had \$0 in loans to \$1 of gift-aid, and the student with the maximum ratio had \$27.4 dollars in loans for every \$1 of gift-aid.

Table 2

Descriptives for continuous variables

Predictor	N	Min.	Max.	SE	Mean	SD
GPA	2,961	0	4.0	.02	2.48	1.18
Loan sum	509	\$325	\$7,500	77.07	\$3,126.88	1738.89
Gift-aid sum	2,227	\$48	\$9,810	33.36	\$3,013.85	1574.08
Loans-to-gift-aid ratio	417	0	27.4	.10	1.46	2.12

Descriptive Statistics for Research Question (RQ) 1

What are the characteristics of zero-EFC students as compared to non-zero-EFC students at a large urban community college district? As illustrated in Table 3, the descriptive and chi-square analyses show that all of the proportional differences in the independent variables across the sub-samples were found to be statistically significant. Race, sex, high school diploma, developmental education, part/full-time, GPA, program of study, and financial aid types differed significantly across the zero-EFC, low-income, and high-income students at a .01 p-value.

Financial aid. Across the three subsamples, students with gift-aid only represented 79.6%, 88.7%, and 82.5% of the proportions in the zero-EFC, low income, and high-income group, respectively. Students with gift-aid plus loans held the greatest proportion (20.4%) among the zero-EFC group, compared to 11.3% and 17.5% in the low income and higher income groups, respectively. The proportional differences were statistically significant across the three groups ($\chi^2=15.9, p<.001$). In terms of the loans-to-gift-aid ratio, 59% of the zero-EFC students, and 72.5% of the low-income group both had a ratio less than 1. Among the high-income group, the greatest proportion of students (74.2%) had a ratio above 1. The proportional differences among the three subsamples were statistically significant ($\chi^2=16.7, p<.001$).

Table 3

Descriptives & Chi-Square for zero-EFC, low-income, and high-income students

	Zero-EFC (n=2044)		Low-income group EFC \$1-\$2100 (n=420)		High-income group EFC=>\$2100 (n=497)		Chi- square statistic
	n	%	n	%	n	%	
Sex							
Male	710	34.8%	169	40.2%	211	42.5%	12.8*
Female	1,333	65.2%	251	59.8%	285	57.5%	
Race							
Asian	227	11.1%	49	11.7%	51	10.3%	85.1%**
Black	974	47.7%	146	34.8%	160	32.2%	
Hispanic	655	32%	195	46.4%	200	40.2%	
White	188	9.2%	30	7.1%	86	17.3%	
Academic preparation							
H.S. diploma	1714	83.9%	411	97.9%	484	97.4%	114.2**
GED/Other	330	16.1%	9	2.1%	13	2.6%	
Referred to Dev Ed.							15.8**
Yes	1558	76.2%	357	85%	391	78.7%	
No	486	23.8%	63	15%	106	21.3%	
College experience							
Full-time	879	43%	226	53.8%	307	61.8%	63.8**
Part-time	1165	57%	194	46.2%	190	38.2%	
GPA 1 st sem.							
<2.0	443	21.9%	80	19.3%	83	16.8%	38.5**
2.0 – 2.9	602	29.7%	173	41.7%	201	40.8%	
> 3.0	981	48.4%	162	39%	209	42.4%	

Program of study

Seeking Certificate?

Yes	209	10.2%	23	5.5%	30	6%	
No	1835	89.8%	397	94.5%	467	94%	15.6**

Financial aid

Gift-aid & loans	341	20.4%	40	11.3%	32	17.5%	
Gift-aid only	1331	79.6%	313	88.7%	151	82.5%	15.9**
Loans-to-gift-aid ratio							
< 1	197	59.0%	29	72.5%	8	25.8%	
> 1	137	41.0%	11	27.5%	23	74.2%	16.7**

Note: ** p<=.000, *p<=.01

Logistic Regression Analysis for RQ 2

For students with financial aid packages with gift-aid only, and gift-aid and loans, to what extent do these **combination types** affect the likelihood of persistence from the first year of enrollment to the second year by income status? Logistic regression was applied to the full sample of FAFSA filers to assess whether a financial aid award type including gift-aid plus federal student loans improved students’ odds of persistence to the second year as compared to an award type of gift-aid only. Table 4 and 5 summarize the results of the regression analysis. Both the initial model (Table 4) with Block 1 variables (including sex, race, developmental education, high school diploma, full/part-time, GPA, program of study, federal loan amount, gift-aid amount) and the overall model presented in Table 5 (Block 1 variables plus Block 2 variables consisting of financial aid combination type, EFC group, and the interaction term between financial aid and EFC group) were statistically significant ($\chi^2=514.14, p<.001$; $\chi^2=568.70, p<.001$). Adding the additional predictors and interaction term to the model caused a statistically significant reduction in the -2 log likelihood statistic, suggesting that adding Block 2 variables improved the viability of the model. For the overall model (Table 5), the Nagelkerke R Square was 30% which was used as one measure of model viability. Additionally, the Hosmer and Lemeshow Test yielded a non-significant chi-square ($p=.11$), suggesting that the predictor variables in the model closely predict the actual probabilities of the enrollment outcome. Further, the overall model correctly classified 71.4% of the cases as compared to 71% that resulted from the model with the initial block of variables. Collectively, these results suggest a viable overall model.

In examining background characteristics, results from the overall model (Table 5) show that both sex and race are statistically significant predictors of the likelihood of persistence. Females had a 34% higher odds of persistence (OR=1.34) than males. Asians (OR=.39) had a 61%, and Hispanics (OR=.59) had a 41% lower odds of persistence than Whites. There was no statistically significant difference in the likelihood of persistence between African-Americans and Whites.

Only one of the academic preparation variables was statistically significant. Whether a student was referred to developmental education was not statistically significant in predicting the odds of persistence to the second year. However, students who had earned a high school diploma had a 42% higher odds of persistence (OR=1.42) than students who had earned a GED.

College experience variables had a statistically significant effect on the likelihood of persistence. Students who enrolled part-time had a 25% higher odds (OR=1.25) of persistence than the full-time students. GPA in the first semester was a statistically strong predictor of persistence ($p < .001$). For every one-unit increase in GPA, there was .59 increase in the log odds of persistence. Students' program of study was not statistically significant in predicting the odds of persistence. In examining the financial aid variables, both the loan sum and the amount of gift-aid were statistically significant in predicting the log odds of persistence. Both variables had an odds ratio of 1. There was a .000177 unit increase in the log odds of persistence for every one dollar of federal loans, and a .000394 unit increase for every one dollar of gift-aid. While statistically significant, these differences are relatively small and may have limited practical significance.

Interaction between financial aid combination type and income status. The logistic regression model also served to investigate whether the effects of the financial aid combination type (e.g. gift-aid plus loans vs. gift-aid only) was moderated by students' income status. The interaction term between financial aid combination type and the high-income group was significant ($p = .036$). Specifically, the significant interaction suggests that students who have gift-aid only and are high-income (EFC > \$2,100) are 4.24 times more likely to persist than the zero-EFC students who have gift-aid only. The interaction between the low-income group and aid types was not significant.

Table 4

Block 1 Model for Logistic Regression predicting the likelihood of persistence for students with gift-aid only, and gift-aid and loans award packages

Predictor	β	Wald χ^2	p	Odds Ratio
Background Characteristics				
Sex (Males)	.23	5.02	.025*	1.26
Race/Ethnicity (White)				
Asian	-.91	15.84	.000***	.40
Black	.29	2.74	.098	1.34
Hispanic	-.57	9.77	.002**	.56
Academic preparation				
Dev. Education (College-ready)	.28	5.42	.0208*	1.32
High School Diploma (GED/other)	.51	12.25	.000***	1.66
College experience				
Full-time/PT (FT)	.01	.01	.918	1.01
GPA-1st semester	.59	152.07	.000***	1.80
Program of study				
Certificates (other)	.40	5.07	.024*	1.49
Associates-Transfer (other)	-.17	2.21	.136	.85
Associates-Workforce (other)	-.02	.02	.90	.98
Financial aid				
Loan sum 07-08	.000083	5.59	.018*	1.00
Gift-aid sum 07-08	.000289	67.17	.000***	1.00

Model Fit Statistics

N	2207
Correctly classified	71.0%
Nagelkerke pseudo R ²	27.8%
-2 log likelihood (df)	2518 (13)

Note: ***p<=.000, **p<=.01, *p<=.05; Reference groups for each variable are displayed in parentheses

Table 5

Interaction between Financial Aid Award Package and Income Status: Block 2 Model for Logistic Regression predicting the likelihood of persistence for students with gift aid only, and gift-aid and loans award packages

Predictor	β	Wald χ^2	p	Odds Ratio
Background Characteristics				
Sex (Males)	.29	7.55	.006**	1.34
Race/Ethnicity (White)				
Asian	-.95	16.94	.000***	.39
Black	.24	1.68	.195	1.12
Hispanic	-.53	7.89	.005**	.59
Academic preparation				
Dev. Education (College-ready)	.21	3.06	.080	1.24
High School Diploma (GED/other)	.35	5.50	.019*	1.42
College experience				
Full-time/PT (FT)	.22	4.03	.045*	1.25
GPA-1st semester	.59	146.13	.000***	1.81
Program of study				
Certificates (other)	.34	3.62	.057	1.41
Associates-Transfer (other)	-.18	2.41	.12	.84
Associates-Workforce (other)	-.04	.06	.80	.96
Financial aid				
Loan sum 07-08	.000177	6.96	.008**	1.00
Gift-aid sum 07-08	.000394	97.92	.000***	1.00
Gift-aid & loans (gift-aid)	-.33	1.68	.195	.72
Income status (zero-EFC)				
Low-income	.52	11.94	.001**	1.69
High-income	1.45	42.07	.000***	4.24
Interaction				

Low-income <i>by</i> FA award type	.14	.12	.732	1.15
High-income <i>by</i> FA award type	-.96	5.17	.036*	.38

Model Fit Statistics

N	2207
Correctly classified	71.4%
Nagelkerke pseudo R ²	30%
-2 log likelihood (df)	2464(18)

Note: ***p<=.000, **p<=.01, *p<=.05; Reference groups for each variable are displayed in parentheses

Logistic Regression Analysis for RQ 3

For FAFSA filers with a financial aid package consisting of gift-aid plus loans, what is the relationship between **the ratio of loans-to-gift-aid**, and the likelihood of persistence from the first year of enrollment to the second year by income status? To evaluate if the ratio of loans-to-gift-aid positively or negatively affected students’ persistence to the second year, logistic regression was applied. Table 6 and 7 present the results of the regression model. Both the initial model (Table 6) with Block 1 variables (including sex, race, developmental education, high school diploma, full/part-time, GPA, program of study, federal loan amount, gift-aid amount) and the overall model (Table 7) with Block 2 variables (including initial model variables plus the loans-to-gift-aid ratio, EFC group, and the interaction term between the loans-to-gift-aid ratio and EFC group) were statistically significant ($\chi^2=74.39, p<.001$; $\chi^2=88.45, p<.001$). Adding the additional predictors and interaction term to the model did not significantly decrease the -2 log likelihood statistic (501.53 to 487.47). For the overall model (Table 7), the Nagelkerke R Square was 25.6% which was used as one measure of model viability. Additionally, the Hosmer and Lemeshow Test yielded a non-significant chi-square ($p=.27$), which suggests that the data fit the model well. Further, the overall model (Table 7) correctly classified 70% of the cases which is an improved prediction over the 67% success rate produced by Block 1 variables (Table 6).

In the overall model (Table 7), race/ethnicity was statistically significant in predicting the likelihood of persistence. Similar to the analysis for research question two, Asians and Hispanics were less likely to persist than White students. Asians had 77% lower odds of persistence and Hispanics had 63% lower odds than Whites. Also, the relationship between African-Americans and Whites was not statistically significant.

The two academic preparation variables (e.g. developmental education and high school diploma) were not statistically significant in predicting the likelihood of persistence. GPA in the first semester was the only college experience variable that was statistically significant. For every one-unit increase in GPA, a .41 increase in the log odds of persistence occurred. Students’ program of study and enrollment intensity were not significant predictors of persistence.

In examining the financial aid amount variables, only the gift-aid amount was statistically significant ($p<.001$). For every one-dollar increase in gift-aid, there was only a .001 increase in the log odds of persistence. Loan amount was not statistically significant. Also, the ratio of loans-to-gift-aid was statistically significant ($p<.01$). For every one-unit increase in the ratio, there was a .53 increase in the log odds of persistence.

Interaction between the financial aid ratio and income status. Similar to the earlier analysis, the logistic regression model also served to further investigate whether the effects of the loans-to-gift-aid ratio was moderated by a student’s income status when predicting the likelihood of persistence. The results (Table 7) showed that the interaction term between the financial aid ratio and EFC group was not significant ($p>.05$).

Table 6

Block 1 Model for Logistic Regression predicting the likelihood of persistence for students with a gift-aid and loans only awards package

Predictor	β	Wald χ^2	p	Odds Ratio
Background Characteristics				
Sex (Males)	-.08	.113	.74	.92
Race/Ethnicity (White)				
Asian	-1.22	3.36	.07	.29
Black	.06	.03	.86	1.07
Hispanic	-.99	4.46	.04*	.37
Academic preparation				
Dev. Education (College-ready)	.31	1.34	.25	1.36
High School Diploma (GED/other)	.49	3.14	.08	1.63
College experience				
Full-time/PT (FT)	.25	1.11	.29	1.28
GPA-1st semester	.44	20.94	.00***	1.56
Program of study				
Certificates (other)	.64	2.43	.12	1.90
Associates-Transfer (other)	-.15	.34	.56	.86
Associates-Workforce (other)	.22	.36	.55	1.25
Financial aid				
Loan sum 07-08	.000215	10.652	.001**	1.00
Gift-aid sum 07-08	.000163	3.89	.05*	1.002
Model Fit Statistics				
N	416			
Correctly classified	67.3%			
Nagelkerke pseudo R ²	21.8%			
-2 log likelihood (df)	501.5 (13)			

Note: *** $p\leq.000$, ** $p\leq.01$, * $p\leq.05$; Reference groups for each variable are displayed in parentheses.

Table 7

Interaction between Financial Aid Ratio and Income Status: Block 2 Model for Logistic Regression predicting the likelihood of persistence for students with gift-aid and loans only awards package

Predictor	β	Wald χ^2	p	Odds Ratio
Background Characteristics				
Sex (Males)	.02	.004	.95	1.02
Race/Ethnicity (White)				
Asian	-1.47	4.64	.03**	.23
Black	-0.01	.00	.99	.99
Hispanic	-1.01	4.40	.04*	.37
Academic preparation				
Dev. Education (College-ready)	.26	.93	.33	1.30
High School Diploma (GED/other)	.39	1.85	.17	1.47
College experience				
Full-time/PT (FT)	.40	2.56	.11	1.49
GPA-1st semester	.41	17.41	.00***	1.51
Program of study				
Certificates (other)	.68	2.64	.10	1.98
Associates-Transfer (other)	-.18	.44	.51	.84
Associates-Workforce (other)	.15	.16	.69	1.17
Financial aid				
Loan sum 07-08	.000025	.07	.79	1.00
Gift-aid sum 07-08	.000504	13.08	.00***	1.001
Ratio of loans-to-gift-aid 07/08	.53	7.8	.01**	1.70
Income status (0 EFC)				
Low income	.60	2.23	.14	1.81
High income	.36	.58	.45	1.44
Interaction				
Low-income <i>by</i> ratio of loans-to-gift-aid	-.22	.52	.47	.81
Model Fit Statistics				
N	416			
Correctly classified	70%			
Nagelkerke pseudo R ²	25.6%			
-2 log likelihood (df)	487.5 (18)			

Note. ***p<=.000, **p<=.01, *p<=.05; Reference groups for each variable are displayed in parentheses.

In summary, results showed that the independent variables including sex, race/ethnicity, academic preparation, GPA, enrollment intensity, program of study and financial aid amount influenced the odds of persistence in the first year. When controlling for background characteristics, academic preparation, program of study, GPA, and enrollment intensity, the financial aid types that the student received did not have a statistically significant effect on the odds of persistence. However, when financial aid type was moderated by income status, a financial aid package of gift-aid only yielded higher odds of persistence for the high-income group in comparison to the zero-EFC students with only a gift-aid awards package. In examining the effects of the financial aid amount on the odds of persistence, results showed that the ratio of

loans-to-gift-aid influenced the odds of persistence while controlling for background characteristics, academic preparation, college experience, and dollar amount of gift-aid and loans. However, income status did not moderate the effects of the loans-to-gift-aid ratio on the odds of persistence.

Findings and Discussion

This study's aim was to gain a deeper understanding about the effects that financial aid types have on the enrollment outcomes of the lowest-income students at a large, urban community college. The study found major characteristic differences between the lowest income students and higher income groups. Additionally, results showed that when taking socioeconomic status into consideration, the type of financial aid type that a student receives, affects persistence.

Differences Between the Lowest Income Students and Higher Income Groups

In terms of background characteristics, the zero-EFC students (poorest) were primarily African-American females. Hispanic-females comprised the greatest proportions among the low-income, and high-income group. These results align with present trends showing that the lowest income students, (in this case consisting of the zero-EFC students), and racial minority groups, comprise a growing majority of students enrolling at community colleges (AACC, 2016). However, these findings also raise a noteworthy point. While the two lowest income groups are minority groups, Hispanic and African-American groups are culturally very different, and those differences could influence dropout behavior differently (Chen, 2008). Literature suggests that low-income students are often the first-generation in college (Falcon, 2015; Perna & Steele, 2006). As such, Hispanic's point of reference for making decisions about college and finances is their families' experience. Families of low-income Hispanic students have little experience with domestic financial institutions due in part to language barriers, and immigrant status (Singer & Paulson, 2004). On the other hand, low-income African-American students, while also first-generation, may not share these cultural circumstances (Perna, 2000). Therefore, the types of financial aid awards for each ethnic group could affect a student's persistence differently depending on each groups disposition for one type of aid over another, especially when student loans are part of the award package. The literature supports the notion that Hispanics having an aversion to borrowing, while African-American students are more receptive to this type of aid (Cunningham & Santiago, 2008; Goldrick, Kelchen, & Houle, 2014).

In terms of academic preparation, the two lowest income groups (zero-EFC and low-income categories) were the least academically prepared. The zero-EFC students held the highest proportion of students with a GED/other, and the low-income group had the highest proportion of students that were referred to developmental coursework. Further, the second highest proportion of students that were referred to developmental education was the high-income group. Even though zero-EFC students comprised the lowest proportion of students referred to developmental education, there was a relatively small difference (2.5 percentage points) between the high-income group and the zero-EFC group. These findings have considerable implications when assembling financial aid award packages for students. Academic deficiencies that require students to take developmental education coursework are related to enrollment outcomes, and can negatively influence student persistence (Bailey, 2008; NCES, 2014). Including student loans in a student's award package without being mindful of the academic vulnerability of the student could leave the already financially distressed students susceptible to non-completion of a degree or credential. As the literature suggests, non-completion of a degree limits a student's employment opportunities and worsens chances of default for those students who incur educational debt (Gladieux & Perna, 2005; Nguyen, 2012). Furthermore, borrowing can be especially riskier for academically vulnerable students in certificate programs whose labor returns can vary greatly depending on the field of study, but which could be just as costly to obtain (Carnevale, Rose & Hanson, 2012; Xu & Trimble, 2016).

In regard to a student's college experience, findings suggest that the lowest income students have obligations other than school. More than half of the zero-EFC students enrolled part-time while only 38.2% of the high-income group went part-time. Further, in examining students' GPA across the three income status groups, zero-EFC students hold both the highest proportions among the two extremes of the GPA scale. The zero-EFC students have both the highest percentage of students with GPA's below 2.0, and above 3.0. These findings suggest that community colleges are serving two very distinct groups of low-income students. The literature does point to high-achieving low-income students opting for the community college for fear of not being able to afford the higher-priced and more selective institutions (Bowen, Chingos, & McPherson, 2009; Sherwin, 2012). In terms of the students struggling academically in the first semester, data suggests that these students could be part of the large number of students needing remedial education. National trends show that over 50% of students entering community college require developmental education (Complete College America, 2012; Pretlow & Wathington, 2013), which holds true in this study's sample as well. In regard to financial aid awards, these findings suggest that gift-aid awards, including grants and scholarships combined with student loans may be an appropriate package for the students with the greater academic potential. Studies have suggested that a combination of the two types of aid improves students' persistence (Mendoza, Mendez, & Malcolm, 2009; Murdock, 1989). On the other hand, literature points to the detrimental consequences that borrowing without caution could pose for academically-underprepared low-income students (Gladieux & Perna, 2005; Nguyen, 2012).

In examining the distribution of financial aid use among students in this study, a greater proportion of students had a gift-aid only package versus a gift-aid plus loans award for all income groups—zero-EFC, low, high. However, the split between the proportion of a gift-aid only package versus a gift-aid plus loans was 79.6% for gift-aid and 20.4% for gift-aid plus loans for zero-EFC students. For the other low-income and high-income groups, the gift-aid proportion was 88.7% and 82.5%, respectively. These findings suggest that the lowest income students are more dependent on a combination of aid types than the higher income groups, which is in line with previous studies (Alon, 2011; Mendoza, Mendez, & Malcolm, 2009; Nichols, 1980).

Further, the proportional differences in the ratio of loans-to-gift-aid across the three income status groups provide insight into each group's disposition towards borrowing. The proportion of zero-EFC students with a loans-to-gift-aid ratio that is above 1 is 41 percent. In contrast, 74.2% of the high-income group has a ratio above 1. These findings suggest that of the students with a gift-aid plus loans combination type, a greater proportion of the high-income students are relying more on loans than zero-EFC students. On the other hand, low-income students are relying more on gift-aid to meet college costs. Ironically, it is the low-income students who require the additional loans to meet college costs while borrowing may not be as much of a necessity for their higher income peers. The lower reliance on loans for zero-EFC students poses a threat to their persistence. While this study does not measure student employment, overall trends suggest that 58% of students in the lowest income quartile report having to work to afford college, while only 30% of students in the highest income quartile (Scott-Clayton, 2012). Further, studies suggest that working excessively negatively affects a students' academic performance (Dadgar, 2012; Kalenkoski & Pabilonia, 2008). Findings from this study point to the importance of ensuring that low-income students weigh all their financial aid options, to avoid excessive work or under reliance on loans (Cochrane & Szabo-Kubitz, 2014; TICAS, 2016).

Effects of Financial Aid Types and Ratio of Loans-To-Gift-Aid on Persistence

Accounting for factors suggested by Chen's model (2008) led to a discovery of the effects that financial aid types have on students' persistence depending on their socioeconomic status. Overall, results revealed that when controlling for background characteristics, academic preparation, college experience, program of study, gift-aid and loan amount, the financial aid award type does not significantly influence the likelihood of

persistence to the second year. However, when taking students' income status into account, findings suggest otherwise. Students' income status significantly moderates the effects of financial aid type on persistence. When comparing zero-EFC students to the high-income group, the high-income group has better odds of persistence with both the gift-aid package, and the gift-aid plus loans package. In other words, for the high-income group even when they only have gift-aid, their odds of persistence are better than for zero-EFC students.

Also, one noteworthy point when interpreting these findings is the enrollment intensity of the zero-EFC and high-income group. In this study's sample, the greatest proportion across groups that are attending part-time (57%) are zero-EFC students suggesting that they are incurring relatively lower tuition costs than if they were attending full-time. Even with the lower, part-time tuition costs, gift-aid alone did not seem to be sufficient to help their persistence. On the other hand, the highest proportion of students attending full-time (61.8%) are high-income students suggesting they are incurring relatively higher tuition costs, yet they still had better odds of persistence with just the gift-aid. Certainly, tuition costs are only a fraction of a student's cost of attendance. However, for low-income students even relatively low tuition costs can pose a financial strain. With their limited resources, they must cover expenses beyond tuition, such as books, transportation and housing. The literature suggests that low-income students must use 50% of their family income in order to pay for educational expenses, while higher income groups use less than 13% (Cochrane & Ahlman, 2017).

Results from previous studies provide evidence toward this notion that when financial aid is not enough to make-up for higher costs, its effects are not significant, or it negatively affects persistence (St. John, Hu, & Tuttle, 2000; Stampen & Cabrera, 1988). Also, in examining three decades of research and taking into account today's post-traditional student characteristics including part-time attendance, Pascarella and Terenzini (2005) found that not having enough financial aid continues to influence students' persistence. Essentially, federal grants and loans can help reduce economic disparities between low and high-income groups (Murdock, 1989; Stampen & Cabrera, 1988).

Further, the limited literature on financial aid award packages at community colleges provides some additional context to this study's findings. While not directly measuring persistence, Coria and Hoffman (2016) found that gift-aid positively affects low-income students' academic performance and progress. However, their work points to financial aid amount as a point for consideration when examining the impact about whether the financial aid award negatively or positively affect students' progress.

Toward that end, this study also examined the effects that the financial aid ratio of loans-to-gift-aid has on persistence. Findings indicate that the ratio of loans-to-gift-aid significantly influences persistence to the second year when controlling for students' background characteristics, academic preparation, college experience, program of study, and financial aid amount. Unlike the results for financial aid type, the influence on persistence of the ratio of loans-to-gift-aid was not significantly moderated by students' income status. In other words, for all income levels—zero-EFC's, low-income, high-income—the more loans to gift-aid that the student had, the higher the odds of persistence. Therefore, when taking the financial aid ratio into account and not just aid type, adding loans to a financial aid package appeared to help all students regardless of income, persist to the second year. These findings point to a gift-aid and loans combination as a viable financial aid package (e.g. gift-aid and loans) for positively affecting student persistence to the second year. Including loans in an awards package appears to facilitate persistence.

Nevertheless, the literature suggests that loan awards should be cautiously distributed considering the damaging effects loans could have on the most financially-distressed, and academically vulnerable students (Gladieux & Perna, 2005; Nguyen 2012). This study showed that academic preparation factors are significant predictors of persistence as well. Among the zero-EFC students, students who were more academically prepared by having earned a high school diploma versus a GED were more likely to persist,

and these students also represented the greatest proportion. For this particular group, a financial aid package with loans would be appropriate considering their stronger academic foundation thus greater potential for academic success and degree completion. However, for the low-income group which had the highest proportion (85%) of students referred to developmental education, an awards package with loans may not be the optimal package considering their susceptibility to non-completion.

In terms of race/ethnicity, findings revealed that Asians and Hispanics both had significantly lower odds of persistence than Whites. Further, financial aid awards in the context of race/ethnicity is an important point for consideration as it can play a role in students' decisions about the types of aid they are willing to take which can influence their dropout behavior (Chen, 2008). Therefore, while this study shows that a gift-aid plus loans package is a viable option for improving persistence, awarding this combination without regard to race/ethnicity could yield different outcomes. This study's results controlled for race/ethnicity. However, when not taking race/ethnicity into account, students' predispositions to loans may influence persistence differently. Some groups may opt for working more hours in order to avoid incurring debt (Cunningham & Santiago, 2008; King, 2003).

In regard to the persistence effects of enrollment intensity and developmental education, results were counterintuitive to what the extant literature demonstrates. This study's results showed that the odds of persistence were better for part-time students (versus full-time), and for students who had been referred to developmental education (versus college-ready). Also, even though not statistically significant, African Americans also had better odds of persistence than Whites. Results could possibly be attributed to the highly diverse student population at MCC. Also, there is evidence which suggests that students scoring near the college-level cut off for developmental education coursework could experience positive enrollment outcomes (Jaggars & Stacey, 2014). Also, part-time enrollment for a non-traditional population (e.g. adult learners with additional obligations) could be more appropriate and lead to better enrollment outcomes (Fain, 2015).

Implications for Policy and Practice

In today's era of limited federal and state resources, findings from this study can serve to create more efficient and effective policies on federal student aid. Considering that almost half of undergraduate students are enrolling at community colleges (AACC, 2016), policies should address the needs of this higher education sector's growing, diverse student population. In light of the current higher education landscape, policy reforms are indispensable to promoting the persistence of low-income students, whose enrollment behavior is most highly influenced by financial aid availability (Alon, 2011; Murdock, 1989).

Federal policy reform. Findings from this study suggest that gift-aid improves the persistence of high-income students, but it does not improve the persistence of zero-EFC students. Further, findings show that a greater proportion of low-income students are enrolling part-time, which suggests that they are taking longer to complete. Recent Congressional approval to reinstate year-round Pell Grant is a step in the right direction towards helping low-income students. Also, a move to a year-round policy on Pell Grant distribution acknowledges the enrollment patterns (continuous enrollment vs. fall-spring enrollment) of today's college student, especially the community college student. However, further policy reform beyond year-round awards is necessary to the Pell Grant Program considering that the current funding levels of a Pell Grant award per year are still at levels that make it difficult for low-income students to cover full-time attendance costs (AACC, 2016). As evident in this study, low-income, part-time students are not persisting at the same rate as high income students with a gift-aid award which notably includes aid (e.g. state grants) beyond just the Pell Grant. However, this enrollment pattern is an indication that even when a Pell Grant is combined with other gift-aid, it is still not enough to divert low income students toward their academics

entirely. Thus, this part-time enrollment pattern coupled with not enough gift-aid, could adversely affect their academic progress.

A promising policy reform for low-income students that could help address the diminishing purchasing power of the Pell Grant are proposals in support of free tuition. “College promise programs” advocate to reduce debt burdens for community college students by offering free tuition (Walizer, 2017). In the context of this study, these free tuition plans have the potential to alleviate zero-EFC students’ need to take excessive debt.

This study suggests that a greater proportion of zero-EFC students are dependent on a combination of gift-aid and federal loans. Also, gift-aid alone is not helping the zero-EFC and low-income students persist. For these students, free tuition as a supplement to gift-aid could facilitate their full-time enrollment which could lead to higher persistence rates. Nonetheless, research suggests that college promise programs must waive tuition in advance of applying other gift-aid to maximize financial aid (Walizer, 2015). Free tuition waivers without regard to the order in which they are applied to a student’s award package, will not help reduce students’ debt burden. As this study shows, higher loan-to-gift-aid ratios may be necessary in order to persist beyond the first year. However, that aid combination will only work if the student completes a degree. Otherwise, an accumulation of debt but no degree can lead the poorest students to an even further distressed financial situation.

Institutional practice. Policy reform at the state level oftentimes turns to state funding appropriations (National Conference of State Legislatures, 2016), and tuition deregulation in the case of Texas (Schwertner, 2016) to address college affordability. Findings from this study provide insight into other potential and alternative solutions to maximizing limited state aid across the nation. Institutional policy reforms to how financial aid is distributed and packaged could help deliver grant aid to the neediest students. Postsecondary institutions have discretion over how they distribute aid and the proportions they can award in gift-aid versus student loans (Federal Student Aid, 2016). Often disregarded is using an evidence-based approach versus a mechanically-driven approach when developing award packaging procedures (Olivas, 1985). Considering that this study provides evidence toward the significant differences that exist between the financial need and use of aid types among the varying EFC levels (zero EFC vs. greater EFC groups), it would make sense to consider distributing the limited state aid according to EFC level and not so much on Pell eligibility. A financial aid package consisting of a lower ratio of loans-to-gift-aid would be more effective for zero EFC students and low-income students. The lowest ratio could be aimed at the least academically prepared students.

Also, to ensure that loans are not excessively used for either income group, especially in times of scarce gift-aid resources, establishing a maximum loan ratio for each group would have to be built into the institution’s financial aid packaging procedures. As such, institutions would be bound to comply with predetermined parameters. Also, establishing these parameters would incentivize institutions to leverage social and community services, and connect students with those services to cover remaining economic need.

Conclusion

In an era where the rising costs of a college education are becoming more difficult to cover with present levels of financial aid, earning a higher education credential is possible if students are willing to take on educational debt. Diminishing support at the federal level for an expansion of federal financial aid programs, and limited appropriations for state-based aid programs will gravely continue to affect low-income populations’ access to a higher education. Students, especially the lowest income students, require every source of financial aid—federal and state—to realize their academic potential and educational goals.

A comprehensive nationwide higher education plan that acknowledges financial barriers as fundamental obstacles to college access and persistence of its poorest students is necessary to preserving equal opportunity to upward social mobility. Federal and state partnerships which promote leveraging of their financial resources to intentionally facilitate students' persistence are indispensable. Only such partnerships have the potential to ensure the availability of adequate financial aid support and programs for the fastest, growing majority of the undergraduate student population—low-income, community college students.

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