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ORIGINAL PAPER

Framing the Human Capital Investment Decision: Examining Gender Bias in Student Loan Borrowing

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Abstract
Recent literature suggests that the persistent gender wage gap, joined with a larger proportion of student loan debt, reduces the financial benefits of a college degree for women. Grounded in the theory of human capital and behavioral finance, this study investigates gender differences in student loan decisions using an experimental survey design with the online data collection. Participants ($n = 1926$) were randomly assigned to a treatment scenario about whether to enter college or the workforce that was manipulated by attribute frames of a gain, loss, or aspiration and varied by the gender of the character in a hypothetical scenario. The attribute frames did not influence the evaluation of student loan decisions. No significant gender differences were found in the evaluation of student loan borrowing or the experimental treatment scenarios, suggesting societal movement towards more gender-neutral attitudes regarding student loan borrowing and degree-seeking motivations.

Keywords Student loans · Human capital · Gender · College investment · Higher education · College attendance · Framing · Prospect theory

Introduction

Over the past few decades increased borrowing for higher education and the unprecedented growth in student loan debt and delinquencies (Baum et al. 2017; Federal Reserve Board 2018) has given rise to public discourse about the value of a college degree (Baum 2017; Looney and Yannelis 2015). In 2016, American households owed $1.3 trillion in student loan debt, an increase from $340 billion in 2001 (Feiveson et al. 2018). Student loan debt in late 2018 is approaching $1.6 trillion (FinAid 2018). Recent estimates show average education debt between $20,000 to $25,000[1] per borrower (Federal Reserve Board 2018), with debt levels doubling among young adults from $10,600 in 2003 to $20,900 in 2013 (Bleemer et al. 2014). In 2017, approximately one-fifth of student loan borrowers were behind on their payments, a slow upswing from previous years (Federal Reserve Board 2018).

[1] All currencies are measured in US dollars.

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The challenge of student loan debt concerns all students, yet it is developing into a women's issue as they carry about two-thirds of outstanding student loan debt in the US (Miller 2018). Females are more likely to borrow, tend to borrow more, and take about 2 years longer to pay off student debt compared to males (Miller 2018). In 2016, females with a 4-year degree carried $2700 more in student loan debt compared to male degree holders, an increase of $1300 from 4 years earlier (Miller 2018). This means women spend a larger proportion of their earnings repaying student loans, reducing the amount of available income to meet living expenses and achieve long-term financial goals such as homeownership or building adequate retirement savings.

There are known economic benefits of higher education as a college degree can be an essential element on the path to financial security and to making economic gains across the life course. The overall enrollment in US postsecondary institutions increased by 28% between 2000 and 2016, however, females made up the majority (56%) in 2016 (National Center for Education Statistics [NCES] 2018a). Since the mid-1980s, women have outnumbered men in post-secondary programs (Snyder et al. 2018), with a greater number of women completing 2-year, 4-year, and master's degrees compared to men (NCES 2018a). Despite these gains, there continues to be a differential return to education as men surpass women in earnings, regardless of educational degree level (US Department of Labor [DOL] 2017). The financial benefits of a college degree are reduced for women due to a number of reasons such as a persistent gender wage gap and reduced job training opportunities (Blau and Kahn 2017; Radar 2014), however, recent trends in student loan borrowing and the challenges of repayment may further exacerbate disadvantages.

Whether these gender differences emerge in attitudes towards pursuing and investing in a college degree is the focus of this study. We explore gender perspectives in the evaluation of student loan decisions by testing the influence of framing on the human capital investment decision. The study draws from two areas of research: (a) education as a human capital investment and (b) the framing effects literature and the role of gender and value orientation. By taking a gender perspective on student loan decision-making, we contribute to a sparse area of scholarship (Miller 2018).

Review of Literature

Education as a Human Capital Investment

Knowledge and skills gained through higher education are viewed as an investment in human capital. A human capital approach places emphasis on individual or government support for higher education demonstrated through a willingness to invest in educational loans or grants (Becker 1994; Simkovic 2013). According to human capital theory, individuals who graduate from college will be rewarded with higher incomes and their educational investment will pay off financially. Higher levels of education lead to higher earnings. A college graduate is twice as likely to earn over $40,000 per year as a high school graduate (Greenstone and Looney 2012). In 2015, females with a 4-year degree had weekly median earnings 2.5 times greater than females who never graduated from high school (DOL 2017).

The financial return associated with college credentials and the gaps in earnings by educational level have increased over time in the US and other developed nations (Baum et al. 2013; Lochner and Monge-Naranjo 2014), however, there are significant variations based on gender, age, race/ethnicity, and occupation (Carnevale et al. 2011). Various studies and analyses of government data have explored women's return on investment from a college education versus that of men. Women earn less than men, even when they have similar educational levels (DOL 2017). College educated women who work full-time make about one-quarter less than college educated men who work full-time (Miller 2018). Among young adults (ages 25–34) who work full-time, year-round, males holding a bachelor's degree had annual median earnings over $12,000 more than their female counterparts in 2016 (NCES 2018a).

This difference in earnings between men and women can be drastic and severe. Education pays off over the long-term through higher lifetime earnings. The present value of lifetime earnings for individuals holding a bachelor's degree is $500,000 more than a high school graduate (Black et al. 2016). The National Woman's Law Center (2015) estimated that an average full-time working woman will lose more than $460,000[2] in wages over a 40-year period due to the gender wage gap. Women would have to work at least 11 years longer than men to close the gap. A comprehensive analysis of the trends in the gender pay gap show a strong reduction in the gender wage gap between the 1950s and 1980s, with progress slowing down and becoming more uneven in the 1990s and 2000s (Blau and Kahn 2017).

Historically, views towards gender roles have had significant bearing on the opportunity for women to invest in their human capital. Over the last century, changes in the workforce expectations along with substantial shifts in the rights of and attitude towards women drastically reshaped the landscape of both higher education and the workplace across the US (Miller 2018). A shift in female employment out of many traditionally female-held occupations into many previously male-dominated jobs motivated women to invest in their own human capital. At the same time, divorce rates

[2] This variable was measured in US dollars.

were increasing, there was greater legal protection for gender equality in the workplace, and the rise in availability of reliable contraceptive methods was also occurring (Goldin et al. 2006). Blau and Kahn (2017) reported that a large portion of the gender wage gap remains unexplained, however, they show a rise in the explanatory power attributed to gender segregation by occupation and industry and a drop in the explanatory power of education and work experience (Blau and Kahn 2017).

There is ample evidence that the cost of investment in a college degree overshadows the benefits (Black et al. 2016), yet the confidence some Americans place on the value of a college degree may be eroding. In recent national polls, about half of Americans view a college education as a questionable investment (Dann 2017; Public Agenda 2016). In a 2016 nationally representative study, US college and university freshman expressed greater uncertainty in their ability to leverage funding for this important investment compared to previous years, female freshman expressed a greater concern than males (15.8% versus 10.1%; Eagan et al. 2017). Political rhetoric around college affordability may be fueling this public sentiment (Eagan et al. 2017; Miller 2018), while the rising cost of a college degree and the decrease in the availability of grants and scholarships may be fueling the narrative (Burdman 2005; Mezza and Sommer 2015). In summary, evidence supports the notion that higher education is a worthwhile human capital investment and that there are differential returns to education based on one's gender. As an extension of these findings, our study hypothesizes that respondents should value the investment in a college degree, regardless of gender.

Framing Effects and the Influence of Gender and Values

When presented with a choice, people are typically biased by a framing effect. The concept of framing effect refers to decision-making scenarios providing comparable information but manipulated semantically to cast it into either a positive or negative frame (Levin et al. 1998). Framing has been shown to affect choice in a variety of decision contexts (Boeynaems et al. 2017; Gong et al. 2013), however few studies investigate framing in the human capital realm of educational choice and student loan decisions (Lavecchia et al. 2016). Following the work of Cho et al. (2016), the experimental approach presented in this study employs prospect theory which describes a framing effect as outcomes presented through the lens of either a loss or a gain as defined by a reference point (Kahneman and Tverskey 1979; Kahneman 2003). A reference point allows a person to more clearly define the outcome as either a loss or a gain (Kahneman and Tversky 1979).

When a decision is presented as a negative, or loss frame, individuals are more likely to be risk-seeking whereas when a choice is viewed as a positive, or gain frame, they are more likely to be risk-averse (Tversky and Kahneman 1981). For example, the decision to take out a student loan to attend college is a risky choice. Prospect theory would surmise that an individual is more likely to undertake a student loan if the decision is presented through a loss frame by stating that those with a high school degree have, on average, lower monthly income than those with a college degree, the alternative. The potential loss of future income may increase the individual's willingness to take on the risk of educational debt to avoid "missing out" on higher lifetime earnings.

Frames are classified into three main types—risky-choice framing, goal framing, and attribute framing—based on the construction of the choice (Levin et al. 1998). This study investigates attribute framing which simply means when a participant is given a scenario to consider, their attention is drawn to a positive or negative feature, and on a scale they rate how attractive they perceive the scenario to be (Levin et al. 1998). For this study, participants were provided with equivalent information about the return on a human capital investment framed as an economic loss, economic gain, or individual aspiration and then asked to rate how wise it is to take out a student loan and the amount it is wise to borrow. Attribute framing is one of the simpler frames, and does not involve any type of risk, like the more common and classically applied risky-choice frame where respondents choose between risk and options (Levin et al. 1998). The framing literature supports a consistent effect of attribute framing, with positive attribute frames tending to yield favorable evaluations (Levin et al. 2002).

The framing literature identifies gender as a factor that influences the pattern of framing effects, but there is disagreement about whether males or females are more susceptible (Fujimoto and Park 2010; Huang and Wang 2010). In general, investigations of attribute framing find positive frames lead respondents to positive evaluations compared to negative frames (Krishnamurthy et al. 2001; Levin et al. 1998). However, previous researchers found men to be more susceptible to negative framing effects in the monetary/economic domain (Huang and Wang 2010). One explanation for men being more strongly influenced by negative frames in economic scenarios is that the frames are more compatible with men's gender role expectation concerning financial management (Huang and Wang 2010). Fagley and Miller (1997) investigated framing effects in the arena of risky choices (human life versus money) and reported an interaction between gender and framing, with women being found to make riskier choices than men when the outcome was framed negatively as opposed to being framed positively.

Value orientation has also been found to influence the pattern of framing effects (Park 2000). In some value domains,

such as altruism and cooperation, experimental work on gender effects are inconclusive (Fujimoto and Park 2010). The value presented in the attribute frame scenarios within this study is that of education and the human capital investment decision. Men and women tend to value education similarly, with slight differences emerging. Eskilson and Wiley (1999) found male and female college students did not differ in the importance they attached to economic success. Corts and Stoner (2011) found that both males and females were motivated to pursue a degree because of the promise of increased opportunities in careers whereas Green and Hill (2003) concluded women were more likely than men to view higher education as important for career advancement. In terms of value orientation regarding the human capital investment, some research suggests men put less value on college than women do, questioning whether it is necessary or if the cost is worth the benefit (Dwyer et al. 2013). Men have always been more likely than women to say the opportunity to make more money was a key reason for going to college, but the gap between the two genders reflecting this motivation has narrowed over the years (Rampell 2015).

Experimental Design

The experimental approach used in this study tests an attribute frame that aligns aspiration as a value orientation and to serve as a reference point for questions related to student loan borrowing decisions. Previous framing literature suggests study participants may be more influenced by frames they respond to more personally (Kiene et al. 2005). This study's scenarios feature the financial consequence of pursuing a degree and taking on student loans, but also an emotional trigger of "aspiring" to pursue a degree. Participants may respond more strongly if they view the scenario as more relevant and/or personal. If they have their own personal experience with aspiring to pursue an advanced degree, that may or may not have come to fruition, the scenario is potentially more persuasive. Aspiration can be a powerful characteristic within the educational attainment domain as previous work by Wu and Bai (2015) suggested that increased educational aspiration levels have a positive relationship with actual educational outcome.

As stated earlier, there is evidence that men and women face a disproportionately large penalty for not possessing a college degree, but they may differ in the value placed upon higher education due to available substitutions (Dwyer et al. 2013). Employers are increasingly providing training, which can substitute for college, especially in traditionally male-dominated fields (CollegeStats 2013). Men who drop out face no financial penalty in their entry-level salaries while women who drop out face worse job prospects. Unlike women, men are more likely to find higher paying jobs in industries such as transportation, construction, and manufacturing (Strauss 2017).

Although a majority of US adults continue to value a college degree as important, the public is more inclined to view a college education as more necessary for women (77%) to get ahead in life compared to men (68%) (Wang and Parker 2011). Not surprisingly, adults who completed a college degree value higher education more than adults without a degree (Federal Reserve Board 2018). Understanding attitudes toward pursuing higher education is important because previous work has shown motivation for attending college to be linked to academic achievement and degree persistence (Guiffrida et al. 2013). In summary, gender, education, and value orientation are characteristics that may influence framing effects.

Methods

Building on previous literature, the current study furthers the human capital and framing literature by investigating the student loan decision. It extends prior research on student loan borrowing by using an experimental survey with three attribute framing effects by means of hypothetical treatment and control scenarios. A sample ($n = 1926$) of 18 to 64-year-old adults were presented with a control scenario, an economic loss or gain scenario, or an emotional trigger scenario. The scenarios varied systematically by gender. According to Jin and DeVaney (2011), using an experimental design based on scenarios enhances internal and statistical conclusion validity because it increases control over the manipulated variables and reduces random, unmanageable variables. The experimental design allows the investigation of framing effects on the student loan decision using a unique protocol not used extensively in consumer decision-making research.

Research Questions and Hypotheses

The research questions guiding this study were:

1. Is the student loan borrowing decision affected by attribute frames?
2. Does gender, education, or value orientation of the survey participant moderate the effect of attribute framing on the student loan borrowing decision?

Based on previous research, it was hypothesized that student loan decisions would be influenced (a) positively by an economic gain frame, (b) negatively by an economic loss frame, and (c) negatively by a frame that is aspirational. It

was also hypothesized that framing effects would not be moderated by the participant's gender, but would be moderated by the participant's educational level and value orientation.

Data and Sample

A multi-state research project (NC-2172)[3] was developed to utilize an experimental survey design to investigate the educational financing choices for post-secondary education. Data were collected using Survey Sampling International (SSI), a survey sampling company that maintains a panel of consumers. During September 2014, SSI distributed a 38-question experimental survey with hypothetical scenarios to online panel participants between the ages of 18 and 64 and living in the US. Participants were provided a small financial incentive for completing the survey. SSI collected 2158 cases, of which (a) 85 participants discontinued after the informed consent statement and (b) 145 participants completed only the first six survey questions. For the current analyses, the sample was reduced to only participants who received the hypothetical scenario and had over 95% complete information for the variables of interest ($n = 1926$).

The characteristics of the sample analyzed in this study are described in Table 1. The gender of respondents was reasonably balanced: 52% female and 48% male. Both the female and male respondents were predominantly White. More than half of all respondents were between the ages of 25 and 44. A greater proportion of male respondents were single compared to female respondents. The distribution of household income was similar for both genders in the sample, however a greater proportion of male respondents reported higher income compared to females. Approximately 40% of females and 46% of males in the sample had a 4-year college degree or higher. The sample had some experience with student loans as 44% of female and 52% of male respondents took out their own student loans.

Measures

Treatment/Attribute Frames

Participants were randomly assigned to either a control group or a treatment scenario that depicted an attribute framing effect. The control treatment group read a simple description of a hypothetical situation of a soon to be graduating high school student who was either female (Samantha) or male (Jonathan):

> Samantha [Jonathan], age 18, will be graduating from high school in a few months. She [He] has been accepted to the state university which is about 3 h away from where she [he] currently lives. Due to this distance, living at home would not be a possibility if she [he] attends the university.
>
> Recent college graduates, on average, have $26,000 in student loan debt upon graduation. In order to pay the $26,000 in student loan debt, monthly payments of $270 would be made for 10 years.
>
> Samantha [Jonathan] is trying to decide if she [he] should attend college or pursue a career right out of high school. With her [his] current resources she [he] would need student loans to pursue an undergraduate degree at the state university.

This scenario was enhanced with additional information to test an attribute framing effect. Treatment One featured a positive frame that signaled the economic gain of investing in a college degree: "On average, an individual with a bachelor's degree will make $1912 more per month than someone whose highest education level is a high school diploma." Treatment Two featured a negative frame to signal the economic loss of not pursuing a college degree: "On average, an individual whose highest education level is a high school diploma will make $1912 less per month than someone who has a bachelor's degree." Treatment Three featured additional information to signal an emotional trigger about a student with a lifelong dream to pursue and to signal the attainment of a college degree as aspirational: "Samantha [Jonathan] has been dreaming of attending college since she [he] was in middle school. It is all she [he] talks about whenever she [he] is around family and friends."

The scenarios were identical with the exception of the names (Jonathan and Samantha) and gender-specific pronouns. Respondent comprehension was checked to test understanding. The random assignment of respondents yielded fairly equal sized samples across the treatment and control groups. Sample size was over 200 for each scenario, ranging from ([$n = 211$] to [$n = 292$]).[4]

Student Loan Decisions

After being presented with a control scenario or one of three attribute frame scenarios, participants were then asked to evaluate the student loan decision. The first question asked, "Do you think it is wise for Jonathan/Samantha to take student loans in order to pursue a college degree? On a scale of 1 to 5 where 5 is very wise to take out student loans and 1 is

[3] More detail about the NC 2172 project can be found at http://nimss.org/projects/15376 .

[4] More detail about the development of the experimental conditions, the overall effectiveness of the manipulations, and a discussion on the potential benefits and challenge of experimentally designed online surveys can be found in Cho et al.'s (2016) methodological note.

Table 1 Descriptive statistics by gender

	Overall ($n=1926$) N (% or mean)	Female ($n=1001$) N (% or mean)	Male ($n=925$) N (% or mean)
Gender		52%	48%
Student loan decisions			
Wise to borrow student loans (mean)[a]	3.66	3.68	3.63
Amount wise to borrow in student loans (mean)[b]	3.84	3.85	3.83
Value orientation			
Human capital index (mean)	6.13	6.18	6.08
Importance of a college degree (mean)	4.22	4.26	4.16
College degree somewhat or very important		79%	78%
Educational level			
High school or less	337 (17.5%)	188 (18.8%)	149 (16.1%)
Some college	524 (27.2%)	291 (29.1%)	233 (25.2%)
Associate's degree	246 (12.8%)	120 (12.0%)	126 (13.6%)
Bachelor's degree or higher	819 (42.5%)	402 (40.2%)	417 (45.1%)
Age			
18–24 years	317(17%)	193 (19%)	124 (13%)
25–34 years	662 (34%)	362 (36%)	300 (32%)
35–44 years	500 (26%)	234 (23%)	266 (29%)
45–54 years	398 (21%)	194 (19%)	204 (22%)
55–64 years	46 (2%)	16 (2%)	30 (3%)
Race			
White	1281 (67%)	735 (73%)	546 (59%)
African American or Black	263 (14%)	93 (9%)	170 (18%)
Hispanic/Latino	218 (11%)	79 (8%)	139 (15%)
Asian	99 (5%)	63 (6%)	36 (4%)
Native American	20 (1%)	7 (1%)	13 (1%)
Other	45 (2.4%)	24 (2%)	21 (2%)
Annual household income			
Under $20,000	265 (14%)	139 (14%)	126 (14%)
$20,000–$39,999	446 (23%)	245 (25%)	201 (22%)
$40,000–$59,999	410 (21%)	226 (23%)	184 (20%)
$60,000–$99,999	482 (25%)	243 (24%)	239 (26%)
$100,000–$149,999	210 (11%)	101 (10%)	119 (13%)
$150,000 and above	102 (5%)	46 (5%)	56 (6%)
Marital status			
Single, never married	753 (39%)	327 (33%)	426 (46%)
Married without children	232 (12%)	139 (14%)	93 (10%)
Married with children	657 (34%)	363 (36%)	294 (32%)
Divorced	114 (6%)	67 (7%)	47 (5%)
Separated	19 (1%)	10 (1%)	9 (1%)
Widowed	13 (0.7%)	8 (1%)	5 (1%)

Proportion of response is in parentheses

[a]N = 1917

[b]N = 1914

not wise at all to take out student loans." The second question asked, "How much in total should Jonathan/Samantha be willing to take in student loans in order to pursue this degree?" Participants chose from one of seven categories ranging from $0 to $50,000 or more.

Value Orientation (Human Capital Index) Measure

As discussed earlier, pursuing higher education may be viewed as an investment in an individual's human capital insofar as earning a college degree is positively linked to a

greater likelihood of increased future earnings. From a list of nine values or motivations for attaining a college degree (e.g., make more money, signal to others that you are intelligent, increased knowledge, etc.), participants ranked each one from 1 (*least important*) to 9 (*most important*). To arrive at value orientation, a Human Capital Index measure developed by Johnson et al. (2016) was employed by calculating the average rank score for the five human-capital-specific motivations (motivation to make more money, obtain better job opportunities, increase their own skills, increase their own knowledge, and show that they are intelligent). The remaining motivations, including "other," were excluded from this analysis. To garner a better understanding of the respondents' views towards higher education and how this may impact their student loan decision-making, they were also asked "How important is a college degree?" on scale of 1 (*very important*) to 5 (*not important at all*).

Demographics

Participants completed a survey with questions related to demographic information such as gender, educational level, marital status, race, and household income. Participants were classified into four educational groups: high school diploma or less, some college, earned associate's degree, and earned bachelor's degree or higher.

Data Analyses

The analyses included respondents who had complete data for the variables of interest and passed a manipulation check which confirmed that the respondent had read and understood the treatment scenario as intended. The main sample size was ($n = 1926$) and reduced by a few cases where noted. Analysis of Variance (ANOVA) was used for the analyses. The purpose of the ANOVA is to determine whether the means of the dependent variable were statistically significantly different from one another. For example, an ANOVA that results in a significant F test indicates the amount of variance explained by gender is a significant proportion relative to that amount not explained by the variance.

This study examined the effect of the attribute frames that depicted a hypothetical scenario of the college choice decision using an economic gain, an economic loss or an aspirational trigger and varied by gender of the hypothetical subject. First, separate two-way ANOVAs were used to test the effect for gender, education level, and value orientation (human capital index) on two dependent variables: (1) whether it is wise to borrow student loans and (2) the amount one should be willing to borrow in student loans. Using these same dependent variables, separate three-way ANOVAs were conducted to determine if there was an interaction between the attribute frames and respondent's gender separately for level of educational attainment and human capital index. These analyses provided an examination of the influence of attribute framing effects on the respondent's evaluation of student loan borrowing by gender and at different educational levels and different value orientations vis a vis a human capital index.

Results

Descriptive Results

Table 1 additionally shows the mean ratings for the evaluation of student loan decisions, human capital index and importance of a college degree by gender. When asked how wise it was to borrow student loans, more than half of respondents thought it was somewhat wise or very wise, with females rating it slightly greater (3.68) than males (3.63). When asked about the importance of a college degree, the majority of female (79%, $n = 1001$) and male (78%, $n = 925$) respondents indicated it was somewhat important or very important, with females rating the importance of a college degree slightly higher (mean = 4.26) than males (mean = 4.16). More than half of female and male respondents believed a person should be willing to borrow $20,000 or more in student loans to obtain a college degree. Females had a slightly higher mean on the Human Capital Index compared to males (6.18 and 6.08, respectively). None of the rating differences between males and females were statistically significantly different.

Experimental Scenario Framing Results

Treatment Differences: Wise to Borrow Student Loans

Table 2 presents a series of ANOVAs to test the influence of framing effects separately for female and male respondents, their educational level, and human capital index with the dependent measure: evaluation of whether it is wise to borrow student loans to earn a college degree. The first ANOVA displayed in Table 2 directly tests attribute framing effects by respondent's gender and the interaction between attribute frames and gender. There were no statistically significant mean differences between the attribute frame treatments and control groups, $F(7,1901) = 1.356$, $p = 0.220$, or by respondent's gender, $F(1,1901) = 1.216$, $p = 0.270$, in the evaluation of whether it was wise to take out a student loan. The proportion of the variance in the respondent's level of importance placed on how wise it was to borrow student loans explained by the treatment scenarios was small (partial $\eta^2 = 0.005$). The test for a potential interaction effect of respondent gender and the treatment scenarios on attitude

Table 2 ANOVA Results for attribute frames with student loan decision: wise to borrow[a]

	Sum of squares	Mean square	*df*	*F*	*p*	η^2
Gender	1.297	1.297	1	1.216	0.270	0.001
Attribute frames	10.12	1.445	7	1.356	0.220	0.005
Gender × attribute frames	9.318	1.331	7	1.249	0.273	0.005
Error	2026.601	1.066	1901			
Education	68.517	22.839	3	22.00	0.000***	0.034
Attribute frames	9.37	1.339	7	1.29	0.251	0.005
Education × attribute frames	10.518	0.501	21	0.482	0.977	0.005
Error	1956.780	1.038	1885			
Human capital index	18.872	1.048	18	0.968	0.485	0.010
Attribute frames	1.755	0.251	7	0.231	0.987	0.001
Human capital index × attribute frames	67.681	0.760	89	0.702	0.984	0.034
Error	1952.454	1.083	1802			
Gender	4.412	4.412	1	4.277	0.039*	0.002
Education	68.505	68.505	3	22.138	0.000***	0.035
Attribute frames	9.037	9.037	7	1.252	0.271	0.005
Gender × education	2.086	2.086	3	0.674	0.568	0.001
Gender × attribute frames	9.878	9.878	7	1.368	0.215	0.005
Education × attribute frames	11.946	11.946	21	0.551	0.950	0.006
Gender × education × attribute frames	33.144	33.144	21	1.530	0.058	0.017
Error	1911.330	1.031	1853			
Gender	0.397	0.397	1	0.370	0.543	0.000
Human capital index	15.492	0.861	18	0.802	0.700	0.008
Attribute frames	1.357	0.194	7	0.181	0.989	0.001
Gender × human capital index	6.796	0.485	14	0.452	0.957	0.004
Gender × attribute frames	9.810	1.401	7	1.305	0.244	0.005
Human capital index × attribute frames	65.33	0.742	88	0.691	0.987	0.034
Gender × human capital index × attribute frames	96.374	1.357	71	1.264	0.071	0.050
Error	1835.075	1.074	1709			

N = 1914

*$p < 0.05$ (two-tailed), ***$p < 0.001$ (two-tailed)

[a]Scale of 1 (*not wise to borrow*) to 5 (*wise to borrow*)

toward student loan borrowing showed no significant interaction, $F(7, 1901) = 1.249$, $p = 0.273$, partial $\eta^2 = 0.005$.

Next, Table 2 presents an ANOVA testing the attribute framing effects on the evaluation of the student loan borrowing decision by education, and the interaction between attribute frames and education. No statistically significant mean difference was found for the attribute frame treatments and control groups, $F(7,1885) = 1.29$, $p = 0.251$. However, there was a statistically significant mean difference by education, $F(3,1885) = 22.00$, $p = 0.000$. The third two-way ANOVA tested the attribute framing effects by human capital index and the interaction between attribute frame treatments and human capital index. Again, no statistically significant mean differences were shown between the attribute frame treatments and control groups, $F(7,1802) = 0.231$, $p = 0.987$, or by human capital index, $F(18,1802) = 0.968$, $p = 0.485$.

Table 2 then shows three-way ANOVA results of the interaction of the effects of gender, education level, and attribute frame scenarios on the dependent variable. There was a significant main effect for gender $F(1,1853) = 4.277$, $p = 0.039$ and education, $F(3,1853) = 22.138$, $p = 0.000$, but no significant three-way interaction between gender, education level, and attribute frames, $F(21, 1853) = 1.530$, $p = 0.058$.

Finally, Table 2 also shows three-way ANOVA results to determine the effects of gender, human capital index, and attribute frames scenarios on the evaluation of whether it is wise to borrow money in order to pursue a college degree. No significant three-way interaction was shown between gender, education level, and attribute frame scenario, $F(71, 1709) = 1.264$, $p = 0.071$.

Table 3 ANOVA Results for attribute frames with student loan decision: amount to borrow[a]

	Sum of squares	Mean square	*df*	*F*	*p*	η^2
Gender	0.171	0.171	1	0.096	0.757	0.000
Attribute frames	20.88	2.98	7	1.677	0.110	0.006
Gender × attribute frames	7.21	1.03	7	0.579	0.773	0.002
Error	3376.28	1779	1898			
Education	108.256	26.085	3	21.027	0.000***	0.032
Attribute frames	15.901	2.272	7	1.324	0.235	0.005
Education × attribute frames	46.627	2.220	21	1.294	0.167	0.014
Error	3229.702	1.719	1882			
Human capital index	48.625	2.701	18	1.523	0.073	0.015
Attribute Frames	23.929	3.418	7	1.927	0.062	0.007
Human capital index × attribute frames	152.765	1.716	89	0.968	0.566	0.046
Error	3190.933	1.774	1799			
Gender	2.416	2.416	1	1.413	0.235	0.001
Education	105.099	35.033	3	20.492	0.000***	0.032
Attribute frames	17.490	2.499	7	1.462	0.177	0.005
Gender × education	3.579	1.193	3	0.698	0.553	0.001
Gender × attribute frames	9.333	1.333	7	0.780	0.604	0.003
Education × attribute frames	51.307	2.443	21	1.429	0.094	0.016
Gender × education × attribute frames	56.886	2.709	21	1.585	0.045*	0.018
Error	3162.69	1.710	1850			
Gender	0.008	0.008	1	0.005	0.946	0.000
Human capital index	43.399	2.411	18	1.365	0.139	0.014
Attribute frames	23.012	3.287	7	1.862	0.072	0.008
Gender × human capital index	27.687	1.978	14	1.120	0.334	0.009
Gender × attribute frames	24.629	3.518	7	1.993	0.053	0.008
Human capital index × attribute frames	162.146	1.843	88	1.043	0.373	0.051
Gender × human capital index × attribute frames	143.677	2.024	71	1.146	0.194	0.046
Error	3012.50	1.766	1706			

N = 1917

*$p < 0.05$ (two-tailed), ***$p < 0.001$ (two-tailed)

[a]Levels were presented as 1 = \$0, 2 = \$1–\$9999, 3 = \$10,000–\$19,999, 4 = \$20,000–\$29,999, 5 = \$30,000–\$39,999, 6 = \$40,000–\$49,999, and 7 = \$50,000 or more

Treatment Differences: Amount to Borrow in Student Loans

Table 3 presents a series of ANOVAs with the dependent variable: evaluation of the amount one should be willing to borrow in student loans to earn a college degree. Separate two-way ANOVAs test the interaction between attribute frames with gender of the respondent, their education, and human capital index. There was no difference in the mean scores between the attribute framing treatments and control groups in the evaluation of the amount someone should be willing to borrow for gender, $F(7, 1898) = 0.096$, $p = 0.757$ or for human capital index, $F(18, 1799) = 1.523$, $p = 0.073$. Education did have a significant effect, $F(3, 1882) = 21.027$, $p = 0.000$. This result suggests that the respondent's level of completed education had a significant effect on the amount of students loans they felt it wise to borrow in the given scenario. The proportion of the variance in the attitude toward the amount borrowed in student loans explained by the attribute framing treatments was small in most cases (partial η^2 ranging from 0.000 to 0.006). The separate interaction of attribute frames with gender, education, and human capital were not significant, respectively.

The first three-way ANOVA in Table 3 finds a statistically significant three-way interaction between gender, education level, and experimental treatment scenario on the attitude toward the amount of student loan borrowing, $F(21, 1850) = 1.585$, $p = 0.045$. To explore further, some follow-up contrasts were conducted. First, a simple two-way interaction of gender differences for education level and attribute frame on participant evaluation of the amount in student loans a person should be willing to borrow

was examined and found to be statistically significant for male respondents, $F(21, 1850) = 1.698$, $p = 0.025$, but not females, $F(21, 1850) = 1.161$, $p = 0.277$. As follow-up, the simple simple main effect of the experimental treatment scenario was explored and statistical significance was found for male respondents who hold an associate's degree, ($F(7, 1850) = 2.726$, $p < 0.008$), but not for male respondents at other education levels.

All simple simple pairwise comparisons were run for male respondents who have obtained an associate's degree with a Bonferroni adjustment applied to lessen the chances of reporting false-positive outcomes due to several pair-wise tests executed on a single data set (Napierala 2012). A comparison of the mean scores of the attitude toward the amount of acceptable student loan borrowing by treatment scenario contrast found two statistically significant contrasts. The first statistically significant contrast was treatment scenario 4 group (female treatment 3: female subject framed with an emotional trigger) mean score was 4.824 versus 3.607 mean score in treatment scenario 6 group (male treatment 1: male subject using a positive frame and signals the economic gain of a college degree) [1.824, 95% CI [0.347, 3.30], $p = 0.003$]. The second was treatment scenario 4 group (female treatment 3: female subject framed with an emotional trigger and college degree as a psychological desire) was 4.824 versus 3.412 mean score of the scenario 7 group (male treatment 2: male subject using a negative frame and signals the economic loss of not obtaining a college degree) [1.412, 95% CI [0.009, 2.815], $p = 0.047$]. The second three-way ANOVA in Table 3 did not find a statistically significant three-way interaction between gender, human capital index, and attribute framing scenarios on the attitude toward the amount of student loan borrowing, $F(71, 1706) = 1.146$, $p = 0.194$.

Discussion

Using an experimental online survey, this study tested the influence of attribute framing effects on the evaluation of student loan borrowing by adults ages 18–64. It explored whether or not respondents would demonstrate a gender bias toward Samantha and Jonathan, the hypothetical subjects in several treatment scenarios, and whether a bias would emerge when the decision to pursue a college degree was framed as an economic loss, an economic gain, or as an aspirational pursuit. The adults in the study, regardless of whether they were female or male, evaluated Samantha and Jonathan similarly, and for the most part, their evaluation about student loan borrowing did not differ given the attribute framing effects manipulated by a gain, a loss, or an aspiration. Based on previous framing literature, some pattern of response by gender was anticipated. Females have been found to evaluate positively framed decisions more positively, whereas males respond to negative frames (Huang and Wang 2010). The lack of influence of the framing effects altogether, and by gender of the respondent, highlight the importance of exploring student loan decisions and judgments more extensively.

Once respondent's educational level was introduced, gender bias toward Samantha or Jonathan was still absent in respondents' evaluation of whether it was wise to borrow student loans and the amount to borrow for a degree. This absence of gender bias did not change with the manipulation of the framing effects. Given that women increasingly continue to pursue post-secondary education and earn college degrees, as evidenced by the steady rise over the past several decades, and given that the majority of the US undergraduate enrollment and bachelor degree recipients are women, the absence of gender bias suggests women's advancement in education is established as a societal norm. These findings add to the growing literature which suggests continued movement towards gender neutral evaluations in the decision to borrow for or invest in one's human capital.

It also suggests the pursuit of higher education is viewed as an investment, regardless of gender. In dissonance with this norm, is the continued differential return on this human capital investment experienced by women compared to men, with women experiencing disadvantages through lower returns to education, disproportionate amounts of student loan debt, and a persistent gender wage gap. This impacts long-term financial security for women given there are fewer funds available for long-term savings or investing. It also results in a reduced financial benefit of a college degree for women as compared with men.

This finding also suggests women continue to view education as worthwhile investment in terms of career and employment options. This may be a reflection of a more positive outlook on a women's earning potential in the workforce and consistent with previous research which shows the gender wage gap is smaller for younger women than with later career women (Council of Economic Advisers 2014). Yet, the results of this study indicate women do rate a college degree as significantly more important than men. These findings seem to echo similar thoughts of Grasgreen (2013) in that, although there is evidence of movement towards more egalitarian gender roles in the workplace, women may continue to have an internal motivation to obtain a college degree as *insurance* for their future labor earnings whereas men may hold *overly-optimistic* viewpoints about their future ability to earn without a college degree.

Although there were no gender differences in our respondents' attitudes toward taking on student loan debt, there was a slight gender bias found in attitude toward the amount that should be considered reasonable to borrow for student loans. Males who held an associate's degree

responded differently to the gender and framing effects presented in the experimental survey. Male respondents who held an associate's degree and were randomized into the treatment group that read about Samantha's lifelong aspiration to go to college and get a degree, in two circumstances thought it was reasonable for Samantha to take on student loan debt above the national average, around $30,000–$40,000. Samantha's student loan debt was in contrast to Jonathan who would be attending for an economic gain or an economic loss. In both of these circumstances evaluating Jonathan, male participants with associate's degrees in these treatment groups recommended student loan debt around $20,000-$30,000. Significant differences in the responses between treatment scenarios to the suggested amount of student loan borrowing among males who have earned an associate's degree—specifically that scenarios from the aspirational frame should be willing to borrow more money—suggest some individuals indeed view the decision to attain a college degree not in economic terms but possibly as a personal goal whose accomplishment may provide non-economic returns. Future work should investigate value orientations that relate to aspirational and social capital goals more deeply.

A unique contribution of this current study is the use of an experimental design to test potential gender differences in the student loan borrowing decision-making process. Specifically, it focused on learning whether adults viewed a human capital investment in a college degree differently based on the gender of a character in a hypothetical scenario, or their own gender. The absence of significant differences between the treatment scenarios (with varying gender and frames) in response to whether it would be wise to borrow money to pursue a college degree and the amount a person should be willing to take out suggest viewpoints on the human capital investment of higher education may be equalizing between the genders, even if a college degree is presented as an economic gain, economic loss, or aspirational. As previously stated, women are becoming increasingly educated, have increased their labor force participation, and are more likely to work in historically male-dominated occupations (Council of Economic Advisors 2014), potentially contributing to a gender neutral attitude.

The lack of significant differences in the analyses related to the interaction of gender and treatment scenario on attitude toward student loan borrowing suggests respondents did not view the student loan borrowing decision any differently if the hypothetical subject was male or female, including a male respondent reacting to a female subject scenario or vice versa. These results may also lend credence to previous findings of generational differences in reasons to pursue a degree. Twenge and Donnelly's (2016) recent study using the 1971 to 2014 American Freshman data and a smaller validation sample found an overall shift in attitudes toward extrinsic values (e.g., "to make more money") in Boomers, Millennials, and Generation Xers (p. 625). Movement towards more egalitarian gender roles and an increasing belief in the ability for women to earn sufficient wages to justify the borrowing decision at the same level as men may also assist in understanding these results.

Another unique contribution of this current study is the use of an experimental design to test a gain frame versus a loss frame versus an aspirational/emotional frame in the context of student loan decisions. It was hypothesized that student loan decisions would be influenced either positively or negatively depending on the frame presented. Previous literature is fairly consistent that gain frames are more effective than loss frames (Gerend and Cullen 2008), yet this experimental study did not find either frame more effective. Respondents in the study were not strongly convinced either way when the student loan borrowing choice was framed as an economic loss or an economic gain. This study extends previous prospect theory work and it is one of the few studies to test framing in the arena of student loan decision-making.

Implications and Conclusions

Uncertainty about the worth of a college degree has emerged despite robust evidence supporting its returns (Fain 2017). Undergraduate enrollment in degree-granting postsecondary institutions continues to increase, up 28% in 2016 from 2000, and it is expected to climb by 3% between 2016 and 2027 (NCES 2018a), despite the exaggerated anecdotes in the media characterizing student loan debt (Baum 2017). Based on the jump in enrollment, the American public tends to view a college degree as necessary to get ahead (Wang and Parker 2011) and individuals still value the benefits of a college education. Ongoing discussions about the value of a college degree may cause some people to more critically evaluate their decision about whether to obtain a college degree, what major they pursue, and what specific occupation they ultimately select (Carnevale et al. 2011). The rise in student debt is one issue embedded in these public discussions and individual decisions. Other considerations associated with the decision is the variability in lifetime earnings by an individual's degree type and occupation (Carnevale et al. 2011), however, many Americans believe a college degree outweighs graduating with debt (Martin and Lehren 2012). In the current study, both men and women supported the economic benefit of a degree as being the most important. Students and their families need to calculate the amount of money needed for the education they wish to pursue, understand their borrowing options, only borrow what they need, and understand their repayment options.

The rising cost of tuition is a major component of increased student loan debt. Individuals often make decisions without full information due to the lack of transparency concerning the full cost to attend college and the lack of tools to conduct a true cost/benefit analysis (College Board 2010). To assist students in making such decisions, students may benefit from institutional support in decision-making and helping estimate the true returns to education. A holistic approach with multi-layers would be most beneficial to the diverse needs of individual students. For example, in addition to student loan counseling upon taking out their student loans, follow up *just in time* counseling, peer-to-peer financial counseling, financial literacy classes during college, and other forms of interventions could be helpful. A surprising finding was that male respondents with an associate's degree thought Samantha should be willing to take on a fairly sizeable debt load to pursue a degree. Given the current focus on the unmanageable debt levels taken on by some students, particularly those at for-profit institutions, future studies could include a qualitative component to follow up on this attitude that encourages risk taking and possibly unmanageable debt.

There are many reasons why an individual would choose to pursue a college degree. The experimental approach of this current study only examined hypothetical scenarios which emphasized the economic gain (positive frame), the economic loss (negative frame), or the aspirational reasons one would consider in the decision-making process of post-secondary educational attainment and student loan borrowing, and ultimately, a human capital investment. There was an attempt to explore the role of non-economic factors of a college degree through the use of an aspirational frame. However, the current study did not include treatment scenarios which may encompass other reasonable and practical reasons to attend college such as skills training, expanding one's social network, meeting new people, or learning something new. While the hypothetical scenarios are designed to illustrate a normal situation, it may not be representative. A fruitful area for future research would be to include additional frames in a similar experimental approach to more closely examine how individuals respond to these contrasting treatments. The study likely omitted other explanatory factors that might have influenced attitudes toward student loan borrowing, such as attitudes toward risk taking and/or debt aversion. The adults in our study, regardless of whether they were female or male, evaluated the treatment scenarios for hypothetical subjects Samantha and Jonathan in the same way, suggesting that adults view advanced education as an important human capital investment opportunity for all adults.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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