Investigating the Success of Academically Talented Students with Financial Need: Pathways and Decisions of Jack Kent Cooke Scholars

Laurel E. Brandon; Sally M. Reis; D. Betsy McCoach
University of Connecticut; Connecticut, U.S.A.

Abstracts

This study investigated the outcomes of financial aid, advising support, and other enrichment opportunities provided to academically talented high school and college students who have strong financial need. The Jack Kent Cooke Foundation provides funding to exceptionally promising young scholars from low-income families to enable them to attend and graduate from competitive universities and also complete graduate school. This research identified positive outcomes of this support for academically talented scholars who received financial support. All responding scholars attended and graduated from selective, competitive colleges, completing their undergraduate education at a much higher rate than their socioeconomic peers and the general population. Over half of the scholars also were enrolled in or completed graduate school.

Keywords: High ability; academically talented; financial need; poverty; college; financial aid.

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The ideal often known as the "American Dream" suggests that a successful future can be created, with the right blend of effort, diligence and higher education. Unfortunately, the majority of American students from families of low socioeconomic status too often fail to attend college and complete degrees (Ratliffe, 2015). Too few academically talented students with financial need attend selective colleges or universities that would provide access to education, resources, and experiences that could propel them out of poverty (Chetty et al., 2017; Glynn, 2017; Hoxby & Avery, 2013; Jaschik, 2016; Ma et al., 2019).

In addition to numerous personal benefits resulting from a college education (including greater lifetime earnings, better health, and increased happiness), society also benefits. In the United States, for example, college graduates are more likely than high school graduates without college to volunteer, donate to charities, vote, engage in community work and activities, be involved parents, and enjoy positive relationships with their neighbors, and less likely to be incarcerated, unemployed, or to exit the labor force entirely (Ma et al., 2019; Trostel, 2015).

Additionally, the usually higher earnings of a college graduate lead directly to increased tax contributions and a reduced need for government assistance. Trostel (2015) estimated that the net lifetime fiscal impact (i.e., taxes contributed less costs of education, government assistance, and incarceration) of an individual who has earned a bachelor's degree is approximately $381,000, which is approximately $355,000 greater than that of an individual with only a high school diploma. An individual with a more advanced degree is estimated to contribute a net $548,000.

Only one foundation in the United States focuses exclusively on high-achieving students with significant financial need. Since 2000, the Jack Kent Cooke Foundation (JKCF) has supported more than 2,700 student scholars with financial aid, advising, and enrichment opportunities. These services

enable these academically talented students to successfully apply to, attend, and graduate from highly selective colleges. The JKCF also offers career advising and financial aid to encourage their awardees to pursue graduate education. The mission of the foundation is "advancing the education of exceptionally promising students who have financial need" (Jack Kent Cooke Foundation, 2020). This research study was conducted to investigate the college experiences, goals, and outcomes, and factors which may have influenced these, of academically talented students who have received support from the JKCF.

Review of related research

In this review of research, the postsecondary trajectories of students with financial need are reviewed, as is their need for financial aid, the decisions they make about which colleges to attend, their majors, and graduate school plans. We also provide a brief profile of the population of Jack Kent Cooke Foundation Scholars.

Postsecondary trajectories of young adults with financial need

Nearly 40% of children in the United States experience poverty for at least one year prior to age 18, and this poverty disproportionately affects children of color (Ratliffe, 2015). In 2017, 33% of Black children and 26% of Latinx children lived in poverty, as compared with 11% of White, non-Hispanic children (The Annie E. Casey Foundation, 2019). Only 78% of children who live at least one year in poverty graduate from high school, and 59% do not enroll in any form of postsecondary education. In contrast, 93% of children who never lived in poverty graduate from high school and 70% enroll in postsecondary education by age 25 (Ratliffe). In 2014, Only 33 % of Americans had earned at least a Bachelor's degree (DeNavas-Walt & Proctor, 2015), a figure which is also disproportionately influenced by poverty. Nearly three times as many children who never lived in poverty graduate from college as those who experienced poverty as children (37% vs. 13%) (Ratliffe). This lack of postsecondary education undoubtedly contributes to the continuation of intergenerational poverty, as 29% of people aged 25 or older without a high school diploma and 14% of those with a high school diploma but no college education live in poverty. These two groups represent approximately two-thirds of the 12% of all adults 25 or older who live in poverty (DeNavas-Walt & Proctor).

Many secondary students from high-poverty backgrounds demonstrate readiness for postsecondary academics (ACT [formerly, American College Testing], 2019; College Board, 2019). The gap between the percent of underserved[1] students who show readiness for college (up to 31%), however, and the percent who actually complete college (13%) suggests that many academically talented underserved students do not earn postsecondary degrees (ACT; College Board). Those who do attend college usually seek credentials below the bachelor's degree, usually at less selective colleges. According to McFarland and colleagues (2019), three years after exiting high school, only 40% of 2009 ninth-graders from families in the lowest income quintile were enrolled in any form of postsecondary education. An additional 18% had enrolled but left prior to completing their program or degree. Of those enrolled, 68% sought less than a bachelor's degree and only 7% attended a 4-year institution in the top 20% of selectivity (based on mean ACT or SAT [formerly, Scholastic Aptitude Test] scores of admitted students). Fewer than 1% of students from families in the bottom income quintile attend *most selective* colleges, but of that group, 68% had incomes in the top two quintiles by age 35 (Ma et al., 2019). Only half as many of their socioeconomic peers who attended nonselective, 2-year, or for-profit colleges reached the top two income quintiles by that age.

Among students in the top quartile of achievement in 10th grade, the JKCF recently reported that 48 percent from families in the top income quintiles apply to elite schools, as compared to only 23 percent of high-achieving students from low-income families (Giancola & Kahlenberg, 2016). However, the 8-year graduation rate for students from low-income families who attended a highly selective 4-year institution (79%) was much higher than their socioeconomic peers who attended any other type of 4-year institution (34-57%) and nearly as high as that of students without financial need (89%; McFarland et al, 2019). In fact, 92% of high-achieving students from low-income families who attend elite colleges graduate, suggesting that when schools represent a strong academic match, low-income, high-achieving students are usually successful (Giancola & Kahlenberg).

Financial need and college financing

According to the U.S. Department of Education (n.d.), the average yearly tuition at a four-year college ranges from $8,256 (at public colleges) to $27,298 (at private not-for-profit colleges), with an annual high of approximately $57,000 per year. Even after accounting for grants and scholarships, additional costs of attendance including housing, fees, books, and other expenses place the net annual cost of attendance at a four-year college between $12,523 (at public colleges) and $22,284 (at private not-for-profit colleges), with the highest net cost of over $52,451 per year.

Houle (2013) reported that students from families with incomes below $40,000 were more likely than other groups to assume more than $30,000 of debt to attend college, and students from families with incomes between $40,000 and $60,000 had the highest average debt for college. Only 8% of high-achieving students with financial need actually enroll in elite colleges when they are accepted, primarily due to financial concerns (Glynn, 2017; Kienzl et al, 2019). These concerns are likely exacerbated by an absence of understanding about the availability and expectations related to financial aid (Kienzl et al). For example, Hoxby and Avery (2013) found that for students in the lowest economic quintile, need-based grants and scholarships made the out-of-pocket cost to matriculate at the most selective institutions *less* expensive than any other option, including public 2-year colleges.

Decision-making about college majors and graduate school

Training in Science, Technology, Engineering, and Math (STEM) fields drives innovation and economic growth, and these fields are known to lead to careers with generally higher incomes than non-STEM fields (Bell et al., 2018; U.S. Department of Commerce). If one of the reasons an individual who has experienced low family income pursues higher education is to enter a career that might result in stronger financial stability, STEM majors might be a highly desirable path. However, only 17% of postsecondary students whose parents were ever in the first (lowest) or second income quintile during their secondary education pursued a STEM major in college, as compared to 30% of those whose parents were always in the highest income quintile[2]. Differences in the pursuit of a STEM major also appear across genders. In the United States, more women than men earn bachelor's degrees, but more men than women earn bachelor's degrees in STEM fields, by nearly a 2-to-1 margin, across all racial/ethnic groups (U.S. Department of Education, 2016).

Colleges and universities have structures that may affect undergraduates' persistence, choice of major, and graduate degree plans. Gender has also been shown to affect choice of major and graduate school decisions, and some earlier research has suggested that differences in preferences, labor market expectations, and gender-specific effects of the college experience all affect choice of major (Turner & Bowen, 1999). More recent research with students at a highly selective university has found that that male students care more about financial outcomes in the workplace than women and that gender differences exist mainly in student preferences, such as enjoying coursework, gaining approval of parents, and enjoying work at the jobs (Zafar, 2013).

Participation in undergraduate research and Honors program experiences may attract students to various fields, including STEM. These opportunities may also reduce students' likelihood of changing to non-STEM majors, and encourage students, including those from underrepresented minorities, to consider graduate education (Carpi et al., 2017; Craney et al., 2011; Hathaway et al., 2002; Hunter et al., 2007; Strayhorn, 2010). In a recent review of 52 empirical studies published during the past 15 years, Rinn and Plucker (2019) also identified various cognitive and psychosocial benefits gained from participating in Honors programs and honors opportunities that positively influence achievement among academically talented college students.

Faculty mentors also promote undergraduates' persistence and graduate degree aspirations, including among members of groups historically underrepresented in higher education and STEM fields (Brooms & Davis, 2017; Crisp & Cruz, 2009; Samayoa, 2018). Proactive, personal academic advising has also increased retention and graduation rates (Hadyn et al., 2013; Kuh, 2008) .

Jack Kent Cooke scholars

The JKCF awards *last dollar* scholarships to high-achieving students with financial need. As the name implies, last dollar scholarships cover the remainder of the net cost of attendance (including tuition, fees, and living expenses) after all other grants and scholarships are awarded. The JKCF also provides other supports to these Scholars, including college and career advising and financial assistance that can be used for college applications, internships, summer programs, and other college enrichment activities. One of its most highly-attended advising activities is Scholars Weekend, where JKCF Scholars network with their fellow awardees and receive intensive advising related to career selection and graduate school. The JKCF provides scholarships to three groups of students: University Transfer Scholars, Young Scholars, and College Scholars.

University transfer scholars

Jack Kent Cooke University Transfer Scholars (hereafter "Transfer Scholars") are some of the highest achieving community college students in the United States, and have significant financial need (mean community college GPA: 3.84; median family income: $19,369). This JKCF Scholarship Program began in 2002 and has enabled nearly a thousand community college students to matriculate at highly competitive four-year colleges or universities to complete their bachelor's degrees. Each JKCF Transfer Scholar receives financial support (median 2017-2018 award: $19,424) for two to three years, college planning support, ongoing advising, and the opportunity to connect with other Transfer Scholars. This highly competitive scholarship includes personalized advising about selecting, transitioning to, and accessing opportunities in competitive colleges to maximize the student experience.

Young scholars

The JKCF Young Scholars Program began in 2001 and is a five-year, pre-college scholarship for high-performing 7th grade students with financial need (modal 6th grade GPA: 4.0; median family income: $36,882; median 2017-2018 award: $9,765). The JKCF provides comprehensive academic and college advising, as well as financial support for attending private secondary schools, summer programs, internships, and other enrichment opportunities. Advisers support Young Scholars through middle and high school to support their matriculation at top-performing colleges and universities. This support includes helping scholars to set goals, plan their high school experience, attend appropriately rigorous high schools, and participate in challenging academic and extracurricular opportunities. Young Scholars are also offered year-round JKCF community programming where they can build a network of high-achieving peers.

College scholars

The Cooke College Scholarship Program began in 2006 and is available to high-achieving high school seniors with financial need who intend to graduate from top four-year colleges and universities. This highly competitive scholarship (mean high school GPA: 3.86; mean 12th grade ACT score: 32; median family income: $32,837; median 2017-2018 award: $6,493) includes advising for topics such as selecting a college, navigating financial aid, transitioning to college, and maximizing the student experience.

Research questions

This study investigated the following research questions:

1. What is the postsecondary experience of JKCF Scholars with regard to how many attend and complete college and graduate school, the college's competitiveness, and the majors and careers they pursue?
2. What alterable factors do JKCF Scholars believe contributed to their college, graduate school, and career decisions?
3. Do differences due to gender, family poverty, or racial/ethnic background exist in the experiences and factors examined in RQ1 and 2?
4. Do JKCF scholars believe that advising was important to their academic decisions?

Method

Instrument

A survey was developed with questions about the JKCF Scholars' high school and undergraduate experiences, graduate school and career plans, and demographic information. Response logic was used to direct scholars to sets of Likert-scaled items that asked the participants to indicate the importance of various possible reasons for their decisions and plans, such as receiving advice from professors, experiencing discrimination, or following their academic interests. The content for these items was developed from a comprehensive literature review that included research on college and career decision-making in the general population, as well as in populations of academically talented students from low socio-economic backgrounds (Crisp & Cruz, 2009; Giancola & Kahlenberg, 2016; Glynn, 2017; Hathaway et al, 2002; Wyner, Bridgeland, & Diiulio, 2009).

Scholars were asked a series of questions about decisions they made during college, such as whether they changed their major or their plans regarding graduate school. Following their response, they were presented with Likert-scaled items (1: not at all to 5: extremely) regarding the importance of various factors in their decision-making process. The decision tree that led to these items had many possible branches, resulting in widely varied response rates for the various filtered items. For example, 353 Scholars indicated they had graduated college and received the question "Are you currently in graduate school?", to which 117 answered "yes", 218 answered "No" and 18 did not respond. Additional filtered questions followed both "Yes" and "No" responses. Parallel item construction made it possible to create new variables in order to examine the factors that were important to the scholars' decision-making processes.

We recoded the responses to several short-response and dropdown-select items. We used a list of specific supports that JKC made available to each group of scholars for relevant questions. We also used Barron's Profiles of American Colleges (2019) to manually recode the college or university the Scholar indicated they were attending or had attended for their undergraduate degree. Colleges were coded 1-6 in order of least to most competitive, or 7 if they were in Barron's "special" category. Because almost all of the JKCF Scholars attended highly ranked colleges, we also created a binary variable (1 = most competitive, 0 = not most competitive). We classified majors as STEM if they involved science, technology, engineering, or mathematics as a primary part of the major, and as Professional if they typically would lead directly to a specific career, such as accounting or teaching. Some majors (e.g., nursing) were coded as both Professional and STEM. This coding was completed independently by two coders with knowledge of university majors, who then met to compare and resolve differences until 100% agreement was achieved. All scholars were asked their current and/or intended occupation, which were classified according to the minimum required degree listed in the Occupational Outlook Handbook from the United States' Bureau of Labor Statistics (BLS). The race/ethnicity item was recoded from 10 options (including multiracial and "other") to White/Asian or Underrepresented for the 503 non-blank responses. For gender comparisons, we examined responses from the 489 participants who indicated male or female (18 indicated a gender other than male or female).

Data collection

The JKCF sent an invitation email with a link to the Qualtrics-hosted digital survey to 202 College Scholars, 487 Young Scholars, and 675 Transfer Scholars in March of 2019, which was the total population of JKCF Scholars with known email addresses. Reminders were distributed after one and six weeks following the initial invitation. The survey was completed in May 2019. The response

rate for College Scholars was 42% (n = 85), for Young Scholars was 38% (n = 184), and for Transfer Scholars was 48% (n = 322). Demographics are summarized in Table 1.

Table 1: Sample demographics (within-group percentages).

Category	Detail	TS (n = 322)		YS (n = 184)		CS (n = 85)	
Gender	Female	60		62		57	
	Male	38		33		41	
	Other	3		5		3	
Race/ Ethnicity	White/Caucasian	41		42		40	
	African American/Black	11		12		1	
	American Indian/Alaska Native	0		1		1	
	Asian American/Asian	13		24		32	
	Native Hawaiian/Pacific Islander	0		0		0	
	Mexican American/Chicano(a)	9		6		9	
	Puerto Rican	1		1		1	
	Other Latino	13		4		7	
	Other	7		4		1	
	Multiracial	7		7		7	
High School Graduation Year	1990-1993	9		-		-	
	1994-1998	8		-		-	
	1999-2003	13		-		-	
	2004-2008	19		18		-	
	2009-2013	37		38		-	
	2014-2018	14		44		100	
Family Poverty	Did Receive Free/Reduced-Price Lunch	44		63		66	
		n	**%**	***n***	**%**	***n***	**%**
Family History of Post-Secondary Schooling*	First in Family to Attend College	139	51	52	33	25	33
	First in Family to Graduate College	108	57	37	34	6	35
	First in Family to Attend Graduate School	85	70	29	42	4	50
	First in Family to Complete Graduate School	36	67	12	39	0	n/a

* Percent of those who responded to the filtered item (e.g., 85 Transfer Scholars indicated they were the first in their family to attend graduate school. This is 70% of the 122 Transfer Scholars who had attended or were currently attending graduate school).

Results

College completion and graduate school goals

JKCF Scholars completed their undergraduate education at a much higher rate than their socioeconomic peers and the general population[3] and on par with their academic peers, and most decided to pursue graduate school (Table 2). Every responding Scholar was either currently in college or had graduated from college. Of the 357 responding Scholars who were college graduates, 207 (58%) were or had been enrolled in graduate school, and only 4 individuals left graduate school early. Out of 232 Scholars who were undergraduates at the time of the survey, 97% believed they had been successful in college, indicating that they were on track to graduate. In comparison, in 2017, fewer than 60% of U.S. students completed a bachelor's degree within 6 years, and only 36% of 2008 college graduates had completed or were currently enrolled in graduate degree programs four years after completing college (National Center for Education Statistics [NCES]). Among Ivy League schools, which 20% of the sample attended as undergraduates, the highest 2019 4-year graduation rate was

88% (U.S. News and World Report, 2019), with an average of 96% of students graduating within 6 years across the Ivy League (Univstats, 2020).

Table 2: Highest degree attained in the United States.

Education	Age 25+[a]	Age 25-29 [a]	JKCF Scholars [b]	JKCF Scholars (College Graduates) [b]
Bachelor's degree	34.16%	35.66%	21%	18%
Master's and/or doctorate and/or professional degree	12.83%	9.17%	88.4%	88.4%
Doctorate and/or professional degree	3.34%	1.81%	50.7%	48.1%
Doctorate	1.88%	0.94%	34.1%	32.4%

a. Actual figures; Retrieved from: https://www.census.gov/data/tables/2014/demo/educational-attainment/cps-detailed-tables.html
b. Aspirations; Data from the current study

Success at highly competitive colleges

The majority of students in all JKCF Scholarship programs attended competitive colleges and universities. Across all three JKCF groups, students who attended the most competitive colleges, as classified by Barron's, reported feeling less successful in college ($\bar{x}$ = 3.91) than those who attended other colleges ($\bar{x}$ = 4.28; d = .50). Despite this perception, these Scholars persisted and graduated from these institutions.

Honors programs

Transfer Scholars were enrolled in an Honors program at significantly higher rates (49%) than College Scholars (27%) and Young Scholars (18%). Two potential explanations for this difference seem plausible. First, it is possible that Transfer Scholars answered "yes" to this question if they participated in an Honors program at their community college, regardless of whether or not they participated in an Honors program at the 4-year university to which they transferred. Second, Transfer Scholars were more likely to attend public universities than other Scholars (X^2 = 76.14, p<.0001) and less likely to attend most competitive private schools than other Scholars (X^2 = 26.53, p<.0001). Honors programs are more common in large public schools and less competitive private schools than they are at the most competitive private schools. College type, therefore, may also explain why Transfer Scholars indicated participation in Honors programs at a much higher rate than the other two groups.

Graduate school aspirations and professional goals

The type of college attended did not seem to relate to students' plans to attend graduate school. Type of college also did not predict reported occupational level of their chosen career: 27.7% of students from most competitive private schools and 28.6% of those from most competitive public schools reported they plan a career that requires a doctoral or terminal degree. Similar proportions of students from private, not-most-competitive schools (30.9%) and public not-most-competitive schools (38.2%) had career plans that required a doctoral or terminal degree. JKCF Scholars who attended public schools were more likely to have STEM majors (X^2 = 17.75; p<.0001) or majors that typically lead directly to a specific profession (e.g., nursing; X^2 = 6.88; p = .009) than those who attended

private schools. School competitiveness was not related to having a STEM major, but Scholars who attended a most competitive school were less likely to have a professional major than Scholars who attended a not-most-competitive school ($X^2 = 4.47$; $p = .04$).

Decision-Making about college majors and graduate school

Table 3: Importance of reasons for changing majors and graduate school decisions, in order of descending means for all responses.

	All Responses		**Yes Grad School**		**No Grad School**		**Changed Major and/or Grad Plan**	
Summary Variables	$\bar{x}$	*N*	$\bar{x}$	*n*	$\bar{x}$	*n*	$\bar{x}$	*n*
benefitting others	4.42	395	4.42	395				
personal fulfilment*	3.99	486	4.22	395	3.04	50	3.73	244
positive reasons	3.78	467	4.12	395			2.55	199
financial reasons	3.67	470	4.07	393	3.16	45	2.88	104
family reasons	3.40	441	3.94	392	1.85	42	2.11	128
academics	2.27	153			1.89	44	2.41	117
negative reasons	2.16	261			2.31	49	2.13	234
reasons related to time	2.15	241			2.49	47	2.08	215
influence of others	2.02	153			1.56	39	2.17	122
discrimination	1.75	204			1.64	38	1.76	183
others discouraged	1.71	130			1.52	37	1.80	101
Individual Items								
make a positive difference	4.58	395	4.58	395				
help others	4.51	394	4.51	394				
following career goal	4.30	479	4.53	391	3.21	48	4.07	234
fulfil my potential	4.30	388	4.30	388				
support my family	4.16	384	4.16	384				
following interests	4.13	469	4.47	391	2.39	31	3.79	232
financial success	4.00	392	4.00	392				
make family proud	3.71	388	3.71	388				
prestige	3.56	392	3.56	392				
high enough aptitude	2.96	103					2.96	103
financial challenges	2.95	142			3.16	45	2.88	104
new work opportunity	2.95	113			2.78	36	3.02	82
influence of professors	2.26	128			1.48	25	2.40	108
family obligations	2.24	124			2.29	41	2.19	90
requires too much time	2.21	229			2.79	47	2.10	202
mental health/health	2.03	105			1.87	38	2.14	75
too difficult	1.99	226			1.69	45	2.05	201
influence of family	1.94	128			1.39	33	2.11	101
too many years in school	1.90	207			2.03	32	1.87	191
grades	1.88	125			2.18	34	1.80	97
no one like me	1.84	187			1.61	28	1.91	171
competition	1.80	212			1.85	33	1.80	194
wanted to start a family	1.77	127			1.84	37	1.77	95
aptitude too low	1.77	126			1.74	42	1.84	92
SES discrimination	1.64	189			1.74	38	1.59	166
influence of partner	1.58	112			1.21	33	1.73	84
gender discrimination	1.47	173			1.43	37	1.50	153
race/ethnic discrimination	1.41	166			1.41	34	1.41	146
romantic relationship	1.33	107			1.47	34	1.32	79
influence of friends	1.20	101			1.17	30	1.21	75

* Computed from mean of available variables for each group, selected from: fulfil my potential, prestigious career, career goal, interest, new work opportunity, and high aptitude.

Table 3 summarizes the importance that Scholars ranked as reasons for their choices regarding their college major and graduate school. Scholars strongly endorsed positive reasons for deciding to attend graduate school, particularly those related to benefitting others (helping others, making a positive difference, and supporting their family) and to personal fulfilment (pursuing their academic interests, attaining their career goals, fulfilling their potential, and entering prestigious careers). The three strongest and most common reasons for not attending graduate school were related to career goals that didn't require graduate school, financial challenges, and concerns about the amount of time required for graduate school.

Half of the Scholars who were undergraduates at the time of the survey reported that they had changed their plans regarding graduate school since entering college. The most common reasons for change were positive, as Scholars chose to follow their changing academic interests and career goals. Nearly half changed their goals because they realized that they had a high enough aptitude for a more challenging graduate school option. For those who had planned to attend graduate school but ultimately decided against it, financial challenges were the most important reason (n = 33, $\bar{x}$ = 3.18; SD = 1.55). Scholars generally rated discrimination as unimportant to their decisions to change their plans, but many Scholars rated feeling alone ("No one like me") as somewhat important to their change of plans.

These JKCF Scholars were also very involved in experiences associated with persistence in STEM fields and into graduate school (Brooms & Davis, 2017; Carpi et al., 2017; Craney et al., 2011; Crisp & Cruz, 2009; Hathaway et al., 2002; Hunter et al., 2007; Strayhorn, 2010; Samayoa, 2018): 60% (78% of STEM majors) participated in undergraduate research, and 48% (50% in STEM) indicated they had a faculty mentor.

Reflecting prior research, participation in some college enrichment experiences was positively associated with doctoral degree aspirations. JKCF Scholars who participated in summer or academic year undergraduate research or had a faculty mentor were more likely to pursue a doctoral-level goal degree and less likely to pursue a master's-level goal degree than those who did not (Summer X^2 = 29.80, p<.0001; Academic Year X^2 = 13.87, p = .001; Mentorship X^2 = 12.88, p = .002). No other college enrichment experiences were statistically significantly related to master's or doctoral degree aspirations.

Few differences related to gender, race, and family poverty

Prior research suggests that women and members of racial/ethnic minority groups pursue degrees and careers in STEM fields at lower rates than their white, male peers (Bell et al., 2018; U.S. Department of Commerce, U.S. Department of Education, 2016). We examined the data for differences related to gender, family poverty, and racial/ethnic background in the Scholar's choice of majors, participation in enrichment experiences, and goals. In contrast to the general population, these high-achieving students with financial need were remarkably consistent across groups in terms of their academic experiences, goals, and achievements, with few significant differences (Table 4). Women were more likely than men to pursue a non-professional degree (X^2 = 8.61, p = .003), and also more likely to aspire to a doctorate (X^2 = 6.82, p = .03).

JKCF Supports

JKCF provides a variety of supports to its Scholars in addition to financial aid. The survey included Likert-scaled questions (1: Not at all to 5: Extremely) about how helpful the supports were in

college and how important the Scholars perceived the supports to be to their graduate school and career choices (Table 5). For example, nearly all Scholars indicated that they participated in Scholars Weekend, an intensive advising and networking retreat. Although up to half of Scholars did not take advantage of the other JKCF advising activities, those who did rated the advising as important to their decision-making about both graduate school and careers. This contributes to literature suggesting the importance of academic advising for undergraduates (Hadyn et al., 2013; Kuh, 2008).

Table 4: Categorical relationships related to gender, race, and family poverty (full sample).

	Gender				Race[a]				Ever Free/Reduced Lunch			
	n				n				n			
	M	F	X^2	*p*	W	U	X^2	*p*	Yes	No	X^2	*p*
Undergraduate College Rank												
Noncompetitive	0	1			1	0			0	1		
Less Competitive	2	3			4	1			2	2		
Competitive	11	20			20	11			12	18		
Very Competitive	18	34			36	21			37	19		
Highly Competitive	29	35			39	26			40	25		
Most Competitive	114	188			180	130			201	108		
Special	2	5	2.68	.85	6	1	4.41	.62	3	3	10.01	.12
Undergraduate Major[b]												
STEM Field	116	168			166	120			174	109		
Not STEM Field	70	133	2.03	.15	134	81	.94	.33	139	74	.74	.39
Professional Degree	95	113			132	82			125	87		
Not Professional Degree	91	188	8.61	.003	168	119	.51	.48	188	96	2.73	.10
Goal Degree												
Bachelor's Degree	18	18			24	15			29	10		
Master's Degree	69	92			105	61			100	62		
Any Doctorate	96	191	6.82	.03	170	123	1.56	.46	183	110	2.70	.26
College Enrichment Experiences[b]												
Any Enrichment	167	277	.37	.54	271	187	1.61	.20	284	170	.55	.46
Honors Program*	60	106	.24	.62	102	69	.03	.87	92	79	8.98	.003
Academic Year Undergraduate Research	86	132	.62	.43	139	86	1.25	.27	138	87	.28	.59
Summer Undergraduate Research	70	114	.03	.88	109	78	.10	.75	114	71	.12	.73
Academic Year Internship or Co-op	41	55	1.36	.24	63	37	.78	.38	66	33	.91	.34
Summer Internship or Co-op	82	121	1.23	.27	125	82	.23	.63	137	68	2.92	.09
Study Abroad	47	98	2.48	.12	96	56	1.50	.22	100	51	1.30	.25
Field Study	12	14	.86	.35	15	12	.16	.69	16	11	.13	.72
Fellowship	23	36	.05	.82	32	31	2.12	.15	45	18	2.46	.12
Mentorship with Faculty	75	138	1.01	.32	130	93	.14	.71	142	81	.24	.63
Individualized Major	5	19	3.04	.08	13	13	.96	.33	16	10	.01	.91
Professional Conference	60	110	.63	.43	93	77	2.23	.14	99	71	2.17	.14

[a] White/Asian (W) or Historically Underrepresented Group (U)

* See discussion of honors programs and university type. Transfer Scholars were less likely to report participating in federal free/reduced lunch program than other groups.

Table 5: Use, Importance, and Helpfulness of JKCF Supports.

				Importance to Choices	
	Did Take Advantage		Helpful in College	Attend Graduate School	Occupation
	n	%			
Supports for Transfer Scholars					
Financial Support for College Expenses	299	93	4.9	4.7	4.34
JKCF Scholars Weekend Programming	280	87	4.47	4.01	3.71
Support from Other JKCF Scholars	246	76	4.35	3.98	3.59
Academic Advising	176	55	4.09	3.7	3.21
Other Adviser Support	165	51	4.26	3.87	3.48
Career Guidance	78	24	3.66	3.58	3.47
Supplemental Internship Stipend	58	18	4.53	3.59	3.42
Supports for Young Scholars					
JKCF Scholars Weekend and/or Senior Summit Programming	180	98	4.01	3.51	3.27
Summer Programs	171	93	3.61	3.05	3.65
Financial Support for Interests and Extracurricular Activities	156	85	4	3.4	3.55
Academic Advising	150	82	3.41	3.18	3.06
College Advising	150	82	3.5	3.1	3
Support from Other JKCF Scholars	134	73	3.74	3.32	3.21
Other Adviser Support	118	64	3.53	3.1	3.06
Interest/Career Exploration	109	59	3.27	3.68	3.61
Financial Support for Private School Tuition	96	52	4.8	4.15	3.68
Supports for College Scholars					
Financial Support for College Expenses	80	94	4.88	4.28	3.97
JKCF Scholars Weekend Programming	66	78	4.19	3.15	2.98
Academic Advising	55	65	3.77	2.89	2.75
Support from Other JKCF Scholars	52	61	3.9	2.67	2.76
Other Adviser Support	40	47	3.85	2.68	2.54
Career Guidance	24	28	3.57	2.92	2.74
Supplemental Internship Stipend	16	19	4.73	3.21	2.92

Discussion

The JKCF's investment in these scholars made a difference. Each of the JKCF Scholars, who by definition are from low socio-economic family backgrounds, who responded to the survey either graduated or was on track to graduate from a four-year university. Nationally, only 54% of high-achieving high school students from low-income families complete a bachelor's degree (Wyner et al, 2009). In the general U.S. population, only 29% of college graduates from lower-income families complete graduate degrees (Wyner et al, 2009), but 89% of these JKCF Scholars aspired to graduate degrees, and only 4 (1%) of the Scholars who started graduate school left without completing. In addition to the personal benefits to these Scholars and their immediate families, our society benefits from this type of investment in higher education (c.f., Trostel, 2015), especially as many Scholars have completed graduate school in medicine, sciences, and engineering.

Financial difficulties are a concern for most college-bound students, and the complexities of federal financial aid are also usually perplexing (Kienzl, Croft, & Moore, 2019). This research

demonstrated that additional financial aid enabled some highly able students who otherwise might not have persisted to attend and graduate from challenging and highly ranked four-year colleges and universities. Most also attended graduate schools and pursued challenging careers, and 79% of respondents who had attended or were planning to attend graduate school indicated that the availability of JKCF funding for graduate school affected their decision to attend.

Limitations and future directions

This was a retrospective, self-report survey study, with limitations due to its format as well as its content. Although approximately 40% or more of each group of Scholars responded to the survey, we do not have information about any systematic difference that may have existed between respondents and non-respondents. It is possible that unsuccessful Scholars did not respond to the survey, and that the exceptionally high perceived success, graduation rates, and graduate school aspirations and attendance in our sample are not representative of the entire group of JKCF Scholars. Our survey primarily used Likert-scaled response options, and it is possible that participants' responses were influenced by their perceptions of social desirability, as opposed to representing their true feelings or accurately recounting their participation in various activities. We attempted to address this possibility by making the survey anonymous and clearly stating that their status and funding as a JKCF Scholar would not be affected by their responses. As a retrospective study, it is also possible that memories of participation in various activities or the importance of different factors in their decisions were lost or diminished with time. Future prospective research might follow JKCF Scholars during college, collecting data during advising opportunities in order to track their real-time participation in activities, their perceptions of discrimination, and their decision-making processes.

This research investigated high-achieving young people from low-income families who received foundation support to complete a bachelor's degree or if desired, to attend graduate school. The respondents were exceptionally successful and aspired to advanced degrees at rates far beyond the rates shown by the general population. However, the total population of Jack Kent Cooke Scholars (approximately 2,200 individuals), represents only a tiny fraction of the hundreds of thousands of young people with financial need who graduate from U.S. high schools *each year* with academic records that suggest they could complete at least a four-year degree (ACT, 2016a; 2016b; 2019; Hoxby & Avery, 2013; NCES, 2019; Wyner et al, 2009). Additional attention should be directed to understanding the needs and experiences of high-achieving youth with financial need, both to enable them to achieve their own dreams and so that their talents might benefit society.

Conclusion

Based on the awards provided by JKCF and the responding Scholars' consistently high ratings of the importance of financial aid in college, the main obstacle that stands between high-achieving students with financial need and a four-year degree seems to be money-- specifically, approximately $20-$40,000 more than is currently provided by grants and scholarships in order to fully fund their attendance. These results suggest that closing that gap for more students could provide a significant benefit to society at large, in addition to changing the lives of the individual students (Trostel, 2015).

This study complements and supports previous research demonstrating that high-potential students with financial need are very successful in competitive colleges and universities and can achieve financial security through educational opportunities (Glynn, 2017; Giancola & Kahlenberg, 2016; Wyner, Bridgeland, & Diiulio, 2009). The Scholars who responded to this survey were motivated to pursue advanced degrees and challenging careers to make a positive difference, help others, and pursue their academic interests. They are capable of successfully pursuing graduate degrees in many challenging and important fields. However, most capable students with financial need do not complete these types of postsecondary education because of the significant financial burden they anticipate (Kienzl, Croft, & Moore, 2019). More effort should be made to make all types of college accessible to high-potential students from families of all income levels. In addition to working to reduce the overall cost of college, educators and advisors need to advise more academically capable students from low-income families to learn about the scholarships and the advising support that does

exist in competitive colleges; in addition, these students need help in navigating the financial aid application and college selection process with these indicators in mind.

Notes:

[1] *Underserved* includes students who self-report a family income below $36,000 per year, parental education at or below high school, or a race/ethnicity of African American, American Indian, Hispanic, or Pacific Islander (ACT, 2019)

[2] High School Longitudinal Study 2016 Student data file, author's calculation. Crosstab with percentages using X4RFDGMJSTEM and a variable computed to identify the lowest parent income quartile from X1SESQ5 (2008) and X2SESQ5 (2011). Data accessed 5/7/2020 from https://nces.ed.gov/OnlineCodebook/Session/Codebook

[3] The authors recognize that neither of these comparison groups are ideal, given that JKCF Scholars are selected for the award based on their high achievement.

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About the Authors

Dr. Laurel E. Brandon
Laurel E. Brandon is an elementary enrichment specialist. She completed her PhD at the University of Connecticut with a study of teachers' perspectives on school-based opportunities for student creativity. She conducted this research as a postdoctoral researcher with the Renzulli Center for Creativity, Gifted Education, and Talent Development. She is a co-author of Things My Child Likes to Do (2nd edition), a tool for parents to use to share their child's interests and talents with teachers. Her research and professional interests include enrichment pedagogy, interest and talent development, and positive psychology.

Dr. Sally M. Reis
Sally M. Reis recently completed a term as Vice Provost for Academic Affairs, and is a Board of Trustees Distinguished Professor, and the Letitia Neag Morgan Chair in Educational Psychology Department in the Neag School of Education at the University of Connecticut. Her research interests relate to talent development, special populations of talented students, including students with disabilities, talented women, and culturally diverse talented students. She has authored and co-authored over 300 articles, books, book chapters, monographs and technical reports, as a part of a research team that has generated over 50 million dollars in grants during the last four decades.

Dr. Betsy McCoach
D. Betsy McCoach, *Ph.D.*, is professor of Research Methods, Measurement, and Evaluation in the Educational Psychology department at the University of Connecticut where she teaches graduate courses in Structural Equation Modeling, Multilevel Modeling, Advances in Latent Variable Modeling, and Instrument Design. Dr. McCoach has co-authored over 100 peer-reviewed journal articles, book chapters, and books, including Instrument Design in the Affective Domain and Introduction to Modern Modeling Methods. Dr. McCoach is the founder and Program Chair of the Modern Modeling Methods conference, held at UCONN. Dr. McCoach's research interests include latent variable modeling, multilevel modeling, longitudinal modeling, instrument design, and gifted education.

Address

Prof. Dr. Sally M. Reis;
Board of Trustees Distinguished Professor;
Renzulli Center for Creativity, Gifted Education, and Talent Development
2131 Hillside Road, Unit 3007; University of Connecticut;
Storrs, CT 06269-3007, USA.