The Amherst Telementoring Program for High-Achieving, Low-Income Students: Results of a Pilot Study with a Randomized Controlled Trial

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The Amherst Telementoring Program for High-Achieving, Low-Income Students: Results of a Pilot Study with a Randomized Controlled Trial

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Abstract: This paper reports the results of a pilot study, using a randomized controlled trial to study the effects of the Amherst Telementoring Program for high-achieving students from relatively poor families. This program is designed to assist students with the college application process "in their pursuit of higher education regardless of which institutions they apply to or choose to attend." We followed 98 high school seniors through the college admissions process in 2007-2008, including 51 who were selected at random and offered the opportunity to participate in the telementoring program. We find that telementoring had a significant effect, promoting applications to less selective colleges within the set ranked by Barron's as "Most Competitive". Further, we estimate that students offered telementoring were 3.5 percentage points more likely than students not offered telementoring to enroll in colleges ranked by Barron's as "Most Competitive", though this effect was not statistically significant.

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I. Introduction

It is well known that low-income students are dramatically underrepresented at American selective private colleges. Further, a study by Pallais and Turner (2006) indicates this phenomenon extends to state flagship public colleges. In response, private and public colleges such as Harvard, Princeton, and the University of Virginia have created new programs targeted at low-income students, foundations such as Jack Kent Cooke Foundation and Gates Foundation have funded ambitious outreach efforts, and non-profit organizations such as the POSSE Foundation and Questbridge have created scholarships to support low-income students.

The initial results for these programs seem positive, but there are such a large number of talented low-income students spread across the country that existing programs will not be able to assist all of them. A particular challenge is that students who live far from metropolitan centers are difficult to reach, first because they lack the social networks to learn about the programs and second because of transportation difficulties caused by geographic distance.

This observation identifies a difficult policy problem: how can we help low-income students who (for the most part) are too far away to meet one-on-one with expert counselors, to visit many colleges, or to participate in access events in major cities? Amherst College has introduced one possible answer in its telementoring program. This program matches current undergraduates who are on financial aid at Amherst to assist low-income high school seniors around the country with college applications. Since

advising is being provided by undergraduate students rather than professional counselors, Amherst's program is able to provide high-intensity services to high school students without an extraordinary budget.

This paper describes the results of a small randomized controlled trial designed to evaluate the results of Amherst's telementoring program in 2007-2008. This evaluation was designed as a companion study to Avery (2010), which conducted a randomized trial of ten hours of private college counseling for high achieving low-income students. One important difference between these two studies is that telementoring is by nature less immediate and personal than in-person advising. Yet, it remains possible that telementoring could be more effective than private college counseling. As Amherst's Admissions Director, Tom Parker, commented,

> Students in some cases have more credibility than I do … I'll say something and it's great, but if a student actually says 'I'm going to Amherst College for nothing, and I'm going to graduate in four years and go to med school without one dollar in debt,' that is an amazing statement to be able to make. ... I think there are a lot of low-income students who don't believe or don't understand that this is possible. ("The Amherst Student," February 15, 2005)

A more recent intervention, Expanding College Opportunities (ECO), conducted by Caroline Hoxby and Sarah Turner, provided fee waiver forms and application advice to low-income students through a series of mailings. Hoxby and Turner (2013) report that these mailings had quite substantial effects, in particular on application strategies, admissions outcomes, and the college choices of high-achieving low-income students in a national randomized trial.

On the whole, ECO and the Amherst telementoring program are quite similar; both are designed to provide assistance to low-income students who are qualified for admission to selective colleges, and both are designed to do so in inexpensive fashion. One key difference between the programs is the manner of selection of students. Whereas ECO selected students from the administrative databases of ACT and the College Board, the Amherst telementoring program selected students who had been nominated for a scholarship in the Questbridge program (Questbridge is a non-profit organization that helps identify and place low-income students in private selective four-year colleges), and who did well in the Questbridge rating process but did not ultimately receive a Questbridge scholarship.

The paper proceeds as follows. Section 2 describes the history and design of the telementoring program. Section 3 describes the logistics of the randomized controlled trial. Section 4 summarizes qualitative results from our surveys and interviews of participants. Section 5 provides formal evaluation results. Section 6 discusses those results and concludes.

II. History and Design of the Amherst Telementoring Program

The original idea for the Amherst Telementoring Program grew out of a meeting between Amherst President Anthony Marx and Michael McCullough, the founder of Questbridge. The program is designed to utilize Amherst College students as mentors to act as additional counselors to help low-income high school students through the course of the college application process. The mentors are current Amherst students who themselves are first-generation college students who are receiving significant financial aid; these

mentors are compensated through work-study funds for their work in the program. The program has been quite popular among Amherst students. For instance, in 2006, 38 current students applied for six open positions as mentors.

The prerequisites for high school students to participate in the program are threefold: (1) they must be maintaining at least a B+ average in a college prep curriculum; (2) they must live in households with very limited financial resources; (3) they must be (prospective) first-generation college students. The program expanded from an initial pool of just ten high school seniors to more than 80 participants in 2006-2007.

The primary goals of the program are:

- to bolster students' aspirations to attend college;
- to offer practical support and guidance that will increase students' chances of attending an academically-challenging college;
- to inform students about the vast array of educational and financial options available;
- to provide guidance that more privileged students take for granted;
- to assist students from talented, diverse backgrounds in their pursuit of higher education regardless of which institutions they apply to or choose to attend.

Internal evaluations of the program conducted by the Amherst Office of Institutional Research indicate that the program has succeeded in recruiting students who match the desired characteristics and that they are generally successful in gaining admission to selective colleges. In addition, anecdotal evidence suggests that the program has had quite deep impact on some of the participants, as indicated by the following quotations from mentors in a focus group meeting in the spring of 2007.

> One of my kids…was only considering one local school in New Jersey. She had amazing scores and she could have gotten in wherever she wanted to and I actually had to compel her to apply to really good schools, and she got into all of them…
>
> A few months ago, April 1st, when people find out about decisions, I had a mentee call me up and tell me she had [been admitted to Harvard] and she was really happy …, "I couldn't have done it without you."

At the same time, other comments from mentors in that focus group meeting indicated that students entered the telementoring program with a wide range of needs. Some students were sophisticated enough that they did not need substantial help, and some students simply did not seek much help or respond to specific offers of assistances from their mentors. Table 1 summarizes the assessments of the mentors about how they helped students in the program.[1] Almost all of the mentors felt that they had helped students with researching colleges and deciding where to apply. Approximately four-fifths of the mentors agreed that they had helped students with admissions decisions and with application essays. Interestingly, the mentors who said that they had helped students with their application essays all felt that they had helped "To A Great Extent", suggesting that students either required a lot of help or did not send a draft of an essay to a mentor.

While the internal evaluations of the program have been generally positive, they are also incomplete because they have no baseline for comparison. The critical question – "What would have happened to the participants without the program?" – cannot be answered without detailed study of students who did not participate in the program. For this reason, it is natural to proceed with a formal study that does not change the details of the existing program.

[1] This written survey was completed by 22 of 31 mentors who participated in the Amherst telementoring program in 2006-2007.

Table 1: Amherst Mentors' Self-Assessments of How They Helped Advisees (2006-2007)

Category	To A Great Extent	To Some Extent	To At Least Some Extent
Researching colleges	47%	47%	94%
Identifying appropriate colleges for application	53%	37%	90%
Coping with admissions decisions	29%	53%	82%
Writing the admissions essays	79%	0%	79%
Completing applications for admission	39%	39%	78%
Adjustment issues to college	31%	39%	70%
Comparing financial aid awards	13%	47%	60%
Taking the SATs	5%	42%	47%
Completing applications for financial aid	7%	29%	36%

III. Logistics of the Project

A. Selection of Participants

In the spring of 2007, Questbridge provided Amherst with a list of 500 high school seniors as possible participants for the telementoring program in 2007-2008. These students had competed for Questbridge scholarships, and were ranked highly by Questbridge administrators, but were not sufficiently outstanding to win a Questbridge scholarship. Questbridge only provided coarse ranking information for the 500 students in the list, by dividing the list into two groups – "higher ranked" and "lower ranked".

Table 2 summarizes our preliminary work to select 182 potential participants into two groups, where one group receives telementoring services and the other does not. These 182 potential participants include only the highest-rated Questbridge applicants who attend public schools that are not known feeder schools to selective colleges (e.g. Bronx High School of Science, Brookline (MA) High School, Stuyvesant High School). There were a preponderance of female students in the initial Questbridge list, so we added

additional male students who were not identified to Questbridge by guidance counselors, but instead were identified by non-school based programs.[2]

Table 2: Criteria for Inclusion in Amherst Telementoring Study

Criterion	Percentage Meeting Criterion
Highest Rated Students by Questbridge	338 of 500 (68%)
Attending Public School in the U.S.	309 of 338 (91%)
Attending School with Limited History of Applying / Enrolling at Harvard	250 of 309 (81%)
Excluding Female Students Recommended by Non-School Program	182 of 250 (73%)

With the permission of the Amherst program officers, we matched the students into pairs with 1) same state of residence, 2) same gender, 3) same ethnicity, and 4) similar family income levels. In some cases, we had to relax these requirements to ensure that we could match all students – in these cases, we matched students by region of the country, and by broad ethnicity group (Asian, Black, Hispanic). The result was 91 pairs of students, with one student from each pair selected for telementoring.

We mailed introductory information about the project along with a self-addressed stamped return envelope and a parental consent form in August 2007 to each of these 182 students. Each student was offered a $100 stipend for participation. The introductory information included full information about the series of interviews and surveys that participants would be asked to complete, but did not mention that some students had already been chosen on a randomized basis to be offered the chance to participate in the telementoring program.

[2] It is not certain whether students who were not recommended by their schools are attending so-called feeder schools or not – so they are less likely candidates for inclusion in the study.

A total of 106 students, including 54 selected for the "telementoring" group, agreed to participate, returned the parental consent form, and were formally included in the project. We subsequently contacted these 54 students and offered them the chance to participate in the Amherst telementoring program; 39 students accepted and 15 students refused the offer. We evaluate the effects of the telementoring program in this paper based on "Intent to Treat" (i.e. proceeding as if everyone who was offered the chance to receive counseling actually did so). Otherwise we would never be able to disentangle the connection between the choice to participate in the program and the likely value of the program for individual students.

Table 3: Participation in the Research Project by State

State	Number of Students Participating in Study	Number of Students Offered (Accepting) Telementoring
California	24 (22.6%)	13 (8)
Texas	12 (11.3%)	6 (5)
Florida	7 (6.6%)	3 (3)
New York	7 (6.6%)	4 (3)
Michigan	6 (5.7%)	3 (2)
Louisiana	3 (2.8%)	1 (1)
Ohio	3 (2.8%)	3 (2)
Oklahoma	3 (2.8%)	2 (2)
Pennsylvania	3 (2.8%)	2 (2)
Other	38	17 (11)
TOTAL	106	54 (39)

Of these 106 students who agreed to participate, 98 completed the study. The remaining eight students, including three who had been offered "telementoring" group, did not return surveys and stopped returning phone calls. Though none of them formally requested to withdraw from the study, these eight students did not provide enough information to be included in evaluation analysis. Table 3 summarizes the number of participants by state.

B. Data and Empirical Approach

The study consisted of a series of three phone interviews and two written surveys over the course of the academic year. In addition, we asked all participants to submit a copy of a completed college application to us; we recruited three of the participating guidance counselors with college admissions experience to evaluate these applications.

We rely for the most part on the Barron's college rankings for the purposes of evaluating the admissions and enrollment decisions of students in the study. These rankings classify colleges into broad categories of selectivity, thereby avoiding some of the well-known pitfalls of numerical ranking schemes such as those used by US News and others. In particular, the Barron's rankings are quite consistent from year to year, and are not generally affected by machinations designed to influence the US News rankings. We focus on the top tier of colleges, designated "Most Competitive" in the Barrons rankings, and we use the 2007 Barron's rankings throughout the analysis.

For some parts of our analysis, we divide the set of "Most Competitive" colleges into two groups – where one group ("Most Competitive Group 1") consisted of the most selective (the Ivy League Colleges, Cal Tech, Duke, MIT, Stanford, Williams, Amherst, Swarthmore) and the second group ("Most Competitive Group 2") included all other "Most Competitive" colleges. This second group of less selective colleges within the set of "Most Competitive" colleges is important because these colleges are probably less well-known than Ivy League colleges and because they likely offer many participants in the study the best opportunities to be admitted at a "Most Competitive" college.

IV. Descriptive Statistics and Results from Qualitative Interviews

A. Information about the Student Participants and their College Choices

Questbridge conducted detailed screening efforts to ensure that each of the 500 students it recommended to Amherst satisfied both the criteria for the Questbridge competition and for the Amherst telementoring program. All of the students participating in the study had (unweighted) grade point averages between 3.0 and 4.0, all came from families with household incomes below $70,000 (and 90% came from families with household incomes of $50,000 or less), all were first-generation college students, and all were first-generation college students.[3] Table 4 summarizes the average numerical qualifications for the 98 students who completed the study. None of the differences in average characteristics between the groups of students offered and not offered telementoriing are different at the 5% (or 10%) significance level.

Table 4: Numerical Qualifications for Subgroups of Students

	Offered Telementoring	Not Offered Telementoring
Average SAT Combined Scores	1308.0	1291.3
GPA (Unweighted)	3.85	3.87
Class Rank	95.1%	94.9%
Neither Parent Graduated from College	88.2%	80.8%
Average Family Income	$28.649	$30,725
TOTAL	51	47

Although the students were geographically dispersed, their interests converged on a relatively small number of colleges. Table 5 lists the 17 colleges enrolled at least two students participating in the study; more than half of the students in the study enrolled at one of these 17 colleges. As suggested by the inclusion of selective colleges such as Stanford, Yale, Harvard, and Williams on this list, participating students were both

[3] None of the students had a parent with a four-year American college degree. A handful of students had a parent with a foreign college degree.

ambitious and generally successful in their college applications. More than 80% of the participants applied to at least one college with the highest Barron's ranking of "Most Competitive" and more than two-thirds of the participants were admitted to at least one college with the Barron's ranking of "Most Competitive".

Table 5: Popular College for Study Participants

College	Number of Students Enrolling
Stanford University	6 (6.1%)
University of California, Berkeley	5 (5.1%)
New York University	4 (4.1%)
University of Florida	4 (4.1%)
Yale University	4 (4.1%)
Harvard College	3 (3.1%)
USC	3 (3.1%)
Williams College	3 (3.1%)
Columbia University	2 (2.0%)
Emory University	2 (2.0%)
Georgetown University	2 (2.0%)
MIT	2 (2.0%)
Southern Methodist University	2 (2.0%)
UCLA	2 (2.0%)
University of California, Santa Cruz	2 (2.0%)
University of Chicago	2 (2.0%)
University of Texas, Austin	2 (2.0%)
Other	48 (49.0%)
TOTAL	98 (100%)

B. The Focus of Telementoring

We asked students in the second and third qualitative interviews (typically conducted in March and June respectively) about the nature of their interactions with a telementor.

Table 6: The Focus of Telementoring

Major Area of Interactions	Number of Students
Choice of College Applications	13* (25.5%)
Help with Application Essay	12* (23.5%)
Discussion of Financial Aid	5 (9.8%)
Minimal Contact with Telementor	10 (19.6%)
Refused Telementoring	14 (27.5%)
TOTAL	51

* The numbers reported in this table do not add up to 51 because three students reported that they spent considerable time discussing both where to apply and the details of their application essays with their telementors.

Table 6 summarizes the content of telementoring interactions as described by high school students in qualitative interviews during the course of the program and after the end of the program. In addition to the students who declined the offer to participate in the telementoring program, another ten students reported that they had minimal helpful contact with a telementor. Some students had already made [informal] college decisions and simply didn't need much further guidance from anyone.

> It didn't change where I wanted to go. I visited Reed before and my mind was set.

Another group of students lost interest in the program after flawed early contacts.

> I never contacted her [the telementor]. She didn't seem helpful in her introductory e-mail. She said she'd look at my list of schools later on, but I thought if she wasn't going to do it right then she might as well not help me at all.

> My telementor sent me an e-mail. Once. I sent something back and they never contacted me. … I was on my own the whole time.

Some students commented after the fact that they had missed out on an opportunity for valuable advice.

> It was bad … not taking advantage of [telementoring]. They probably emailed me around 5 or 6 times. I never spoke to them on the phone, I don't know why.
>
> I changed my phone number and didn't have a number to be called on.
>
> I just lost contact with the dude. It would have been helpful to stay in contact with him. I kind of forgot about that.

Combining these two categories – students who refused the offer of telementoring and students who had very limited contacts with telementors, nearly half of those offered telementoring essentially did not participate in the program. Most of the remaining students either concentrated on the choice of where to apply or on the details of college application essays with their telementor.

B1. The Choice of Where to Apply

Among the students who accepted the offer of telementoring, nearly 40% (13 of 37) indicated that their telementors had provided useful advice on where to apply.

> I was really worried about choosing the college I was going to. How do you know the college is right for you? It gave me more ideas about what I should be looking for in a college.
>
> She told me about the atmosphere and types of things that the school actually offers. And she made it clear that I'd spend four years there and would have to appreciate the people there and it's not just academics, and that helped me narrow my choices for the match.
>
> We talked about how Berkeley and UCLA were good schools. And she told me about her experience out of state. It made me realize that it was too far.

Almost all of the participants who consulted telementors about where to submit college applications said that they already had a set of top-choice colleges in mind at the start of the senior year in high school in the fall of 2007. Though they gained sophistication from their discussions with telementors, most of these students made only minor changes to the set of colleges where they applied as a result of telementoring.

> She told me that if I was interested in Amherst, that I should look at other schools like Colby. … I added Colby after she told me about it in November.
>
> I think maybe I didn't apply to one or two because of our conversations—Carnegie Mellon and Oberlin. I was just thinking about what I wanted from college and what I wanted to do afterwards. Carnegie Mellon is too big and Oberlin was too spread out.

In a few cases, a telementor had a great deal of influence on a student's set of applications, and even on the student's choice of college after admission.

> I was speaking to him while formulating my list; we kind of developed it together.
>
> I think she was probably instrumental in me developing a list. The list was pretty unclear right until the last minute.
>
> Washington and Jefferson is very close and my parents wanted me to go there, so he helped with me on how to choose between the two. He said to think about what I wanted to do and which would help me achieve what I wanted to do—which school would do that more.
>
> Once I was accepted, she told me about friends at Penn and what they thought and what their lives were like. She clearly favored U Penn [and the student chose to attend Penn].

<u>B2. Help with College Applications</u>

A similar number of students said that they relied on the telementor for help with completing college applications, especially the essay. First, telementors helped students to choose an appropriate topic for their application essays.

> I wrote an essay about my faith and she told me it's better not to write about that. So I changed it.
>
> Yeah, I had one question about what essay to write and they helped me with that.
>
> She was very helpful in telling me what I needed to say on my application. She told me the main points to emphasize and how to go about doing that.

Second, many telementors worked in detail with students to help edit their essays.

> He had a lot of ideas for sentence structure. My idea was good, but he had a lot of grammar corrections and little things. That helped a lot.

> She told me where to expand or where to eliminate things. I didn't use all of her suggestions, but it was helpful to know what other people thought.
>
> When you write something, it sounds good to you. … Because he read my essay, I had another perspective on what I wrote. I had him read, edit and revise all of my essays. He had really specific comments that were helpful.

V. Evaluating the Effects of Counseling

Table 7 compares the Barron's rankings for the colleges where students enrolled. The descriptive statistics in Table 4 indicate that the two groups of students in the study were quite similar, suggesting that straightforward comparisons of the results in Table 7 should provide a reasonably accurate assessment of the results of the study.

Table 7 suggests that students offered telementoring were somewhat more likely to enroll in "Most Competitive" colleges than those not offered telementoring, though the differences are not statistically significant. As in Avery (2010), we focus on enrollment of students at "Most Competitive" colleges. However, we note that the tabulation in Table 7 also indicates that a disproportionate number of students not offered telementoring actually enrolled in the 2nd highest rated category of "Highly Competitive". Taking these two categories together, students offered telementoring were somewhat less likely to enroll in colleges ranked at least "Highly Competitive".

Table 7: Ranking of Colleges for Students Offered and Not Offered Counseling

	Students Offered Telementoring	Students Not Offered Telementoring
"Most Competitive"	28 (54.9%)	22 (46.8%)
"Highly Competitive"	7 (13.7%)	15 (31.9%)
"Very Competitive"	11 (21.6%)	6 (12.8%)
"Competitive" or Lower	5 (9.8%)	4 (8.5%)
Total Students	51	47

A. Ratings of Application Quality

As part of the study, we asked each participant to provide a copy of a completed college application. We removed identifying information from these applications and asked an experienced college admission officer who had worked previously at a selective college to rate them on a scale of 1 to 4, with 1 as the lowest (worst) and 4 as the highest (best) score. On this scale, students with scores of 3 and above would generally be competitive candidates for admission at a "Most Competitive" college.[4] To be clear, this admissions officer did not know the identities of the students who had submitted these applications and also did know which students had and which students had not been offered telementoring. We group these application ratings into three categories:

(1) Lowest (worst) scores, from 1 to 2.9.

(2) Midrange score of Exactly 3

(3) Highest (best) scores of and "More than 3".

[4] The former admission officer who rated these applications noted that since the application materials submitted by participants in the study did not include recommendation letters or high school transcripts, these ratings may not have captured the true strength/weakness of the actual college applications submitted by the participants in the study.

Table 8a lists the empirical rate of admission for applications (i.e. the probability of admission for each applicant) by application rating category at each group of "Most Competitive" colleges.

Table 8a: Application Rating and Admission Rates at Most Competitive Colleges

Application Rating From Study Counselor	Most Competitive Group 1	Most Competitive Group 2
Less than 3	15.2%	45.7%
Exactly 3	25.0%	63.4%
More than 3	45.3%	84.2%

* NOTE: The computations in this table weight each application equally. Thus, students who submitted more than one application are counted more than once.

Table 8a highlights two distinct patterns. First, conditional on application rating, Group 1 colleges were more selective than Group 2 colleges, with admissions rates at least 30% lower for candidates in each of the three rating categories. Second, within each group of colleges, a higher application rating was strongly correlated with a higher admissions rate. For example, among Group 2 colleges, a shift of one category in application rating is associated with an increase of about 20 percentage points in admissions ratings. That is, Table 8a suggests that the "Admissions Rating" is actually a plausible measure of application quality or strength since it is so clearly correlated with admission decisions.

Nearly three-quarters of participants in the study provided an application, but as shown in Table 8b, there was some bias in the selection across the two groups of students.

Table 8b: Percentage of Study Participants Who Provided a College Application

	Admitted to "Most Competitive"	Not Admitted to "Most Competitive"
Offered Telementoring	26 of 33 (78.8%)	15 of 18 (83.3%)
Not Offered Telementoring	26 of 34 (76.5%)	5 of 13 (38.5%)

Students who were not offered telementoring were much more likely to provide an application at the end of the year if they had been admitted to a "Most Competitive" college. By contrast, students who were offered telementoring" were about equally likely to provide an application if they had been admitted or had not been admitted to a "Most Competitive" college.

Given this disparity in the group of students who provided applications, we have to consider all further analysis of the strength of these application ratings, as rated by the admissions officer associated with the study, to be potentially biased. Nevertheless, as shown in Table 8b, we still find suggestive evidence that telementoring was associated with increases in application quality.

Table 8c: Distribution of Application Ratings for Study Participants

	Less than 3	**Exactly 3**	**More than 3**
Offered Telementoring	11 (26.8%)	14 (34.2%)	16 (39.0%)
Not Offered Telementoring	17 (54.8%)	6 (19.4%)	8 (25.8%)

The average numerical score in application ratings was 3.134 for students "Offered Telementoring" and 2.863 for students "Not Offered Telementoring." This difference of 0.27 points in score was significant at the 10% level. Similarly, a chi-squared test for a difference in the distribution of ratings across the categories in Table 8b was also significant at the 10% level.[5] Given that students who were not offered telementoring tended not to provide applications if not admitted to a "Most Competitive" college, we might expect the statistical comparisons of the results in Table 8b and 8c to be biased

[5] A regression analysis (not reported here) with application rating as the dependent variable using the independent variables in Tables A1 to A4 provides somewhat similar result, but the coefficient on the "Offered Telementoring" dummy variable is only significant at the 20% level.

against finding a positive effect of telementoring. That is, selection issues probably strengthen rather than weaken the case that telementoring improved the quality of the applications submitted by participants – where application quality refers to the strength of the application materials themselves, not the choice by students of where to apply, which is analyzed separately in the next section.

B. Telementoring and the Choice of Where to Apply

Table 9 lists the average number of applications submitted by students.[6] Students offered telementoring submitted more applications overall and more applications to colleges ranked "Most Competitive" by Barron's, but these differences were not statistically significant given the small sample size.

We divided the set of "Most Competitive" colleges into two groups – where one group consisted of the most selective (the Ivy League Colleges, Cal Tech, Duke, MIT, Stanford, Williams, Amherst, Swarthmore) and the second group included all other "Most Competitive" colleges. Across all students, those offered counseling submitted significantly more applications to this second set of "Most Competitive" colleges than did those not offered telementoring.

[6] The calculations in this table excludes 19 participants, including 11 who were offered telementoring, who were admitted and enrolled through Early Decision programs. These students either withdrew or did not submit any other applications. Since they did not submit a full roster of applications, we exclude them from the analysis in this section.

Table 9: Average Number of Applications Submitted*

	Students Offered Telementoring	Students Not Offered Telementoring
Average Applications	7.50 (2.97)	6.82 (2.74)
Average Applications to "Most Competitive"	4.63 (3.52)	3.59 (2.72)
Average Applications to "Most Competitive", Group 1	2.53 (2.16)	2.31 (2.19)
Average Applications to "Most Competitive", Group 2	2.10** (1.63)	1.28 (1.26)
TOTAL	40	39

* These tabulations exclude students who applied and were admitted through Early Decision.
* = significant at 10% level, ** = significant at 5% level.

Of course, the telementors were not particularly oriented to "Most Competitive" colleges and it is not clear whether the telementors were even aware of which colleges were classified in this category in the Barrons rankings: one explicit goal of the program is "to assist students from talented, diverse backgrounds … regardless of which institutions they apply to or choose to attend." Consistent with this goal, the telementors did not always recommend that students should expand their list or that students should apply to more colleges in the "Most Competitive" category.

Table A1 (see Appendix) presents regression analysis results to assess the effect of being offered telementoring on total number of applications and on the number of applications submitted to colleges ranked by Barron's as "Most Competitive". The regression coefficients in columns (1) and (2) indicate that students who were offered telementoring submitted 0.76 more applications overall and 0.9 more applications to "Most Competitive" colleges than students not offered telementoring, controlling for other characteristics. The regression coefficients in columns (3) and (4) suggest that the

difference in applications to "Most Competitive" colleges for students offered telementoring is almost entirely due to applications to the second group of (relatively) less selective colleges within the set of "Most Competitive" colleges. The increase in applications to the second group of "Most Competitive" colleges for students offered telementoring is significant at the 5% level.

Table A2 (see Appendix) extends this analysis to assess the effect of being "offered counseling" on the choice to apply to "Most Competitive" colleges in each category. This table presents results of Probit regressions with the dependent variable equal to 1 for (Column 1) application to any "Most Competitive" college; (Column 2) application to any "Most Competitive, Group 1" college; (Column 3) application to any "Most Competitive, Group 2" college. Consistent with the results of Table A1, students offered telementoring were significantly more likely to apply to a "Most Competitive, Group 2" college, but were not significantly more likely to apply to either "Most Competitive, Group 1" college or to a "Most Competitive" college in general.

One key point of these regression results shown in Table A2 is that they indicate that the effects of telementoring on applications are not simply the result of outliers – i.e. a few students submitting unusually large number of applications. Instead, as shown in Column 3 of Table A2, telementoring is associated with an increase of more than 25 percentage points in the probability of applying to a "Most Competitive, Group 2" college.

C. Telementoring and Admission Outcomes

Table 10 summarizes the average number of admission offers received by students. Consistent with the differences in the average number of applications for these students, those offered telementoring were admitted on average to more colleges, particularly within the set of colleges ranked "Most Competitive". The difference in number of admissions offers was significant at the 10% level for both (1) the entire group of "Most Competitive" colleges and (2) subgroup 2 of "Most Competitive" colleges – the relatively less selective colleges

Table 10: Average Number of Admits*

	Students Offered Telementoring	**Students Not Offered Telementoring**
Average Admits	4.55 (2.56)	4.38 (1.74)
Average Admits to "Most Competitive"	2.25* (2.69)	1.31* (1.32)
Average Admits to "Most Competitive", Group 1	0.83 (1.50)	0.46 (1.07)
Average Admits to "Most Competitive", Group 2	1.43* (1.68)	0.85* (0.84)
Total Students	40	39

* These tabulations exclude students who applied and were admitted through Early Decision.
* = significant at 10% level, ** = significant at 5% level.

Table A3 (see Appendix) extends this analysis to a regression framework with the number of admissions to Most Competitive colleges as the dependent variable. Consistent with the results of Table 10, students offered telementoring received significantly more admission offers at both "Most Competitive, Group 2" and "Most Competitive" colleges overall than did students who were not offered telementoring.

Table 11: Admissions Decisions and Barron's College Ranking

Barron's College Classification	Offered Telementoring	Not Offered Telementoring
Most Competitive Group 1	35.2% (37 of 105)	26.1% (23 of 88)
Most Competitive Group 2	71.4% (60 of 84)	68.0% (34 of 50)
Highly Competitive	83.0% (44 of 53)	98.2% (54 of 55)
Very Competitive	85.7% (24 of 28)	97.7% (43 of 48)

* These tabulations exclude applications that were withdrawn prior to the admission decision.

Table 11 tabulates the percentage of successful applications for students in each of the two groups. These results are not suggestive of any particular pattern in outcomes. Students offered telementoring were slightly more likely to be admitted, conditional on applying, to Most Competitive colleges, but students not offered telementoring were more likely to be admitted, conditional on application, to both Highly Competitive and Very Competitive colleges.

The comparisons in Table 11 clash, to some degree, with our earlier analysis of application ratings. If anything, we would expect to see higher admission rates for those offered telementoring, as their applications were rated to be somewhat stronger than those not offered telementoring. This suggests one of several possibilities: (1) the effect of telementoring on application quality (if any) was too small to have an obvious effect on admission rates in the broad brush comparisons provided in Table 9; (2) the effect of telementoring on application quality was somehow exaggerated by the ratings of applications compiled for the study – perhaps the admissions officer's experience at a "Most Competitive, Group 1" college was not completely applicable to less selective colleges; (3) perhaps students who were not offered telementoring made less effort than

those offered telementoring and submitted relatively poor versions of the applications for the study; (4) the sample size was simply too small and statistical power too low to provide a meaningful test of the differences in application quality and admissions outcomes.

D. Telementoring and College Choices

Table 6 above compares the college choices for students, with the colleges classified by their Barron's ranking. Focusing on the margin of interest in terms of enrollment between "Most Competitive" and "Highly Competitive" colleges in the Barron's rankings, those offered telementoring were 8.1 percentage points more likely to enroll in "Most Competitive" colleges.

Table A4 presents regression analysis results to assess the effect of being "offered counseling" on admission and enrollment to "Most Competitive" colleges. These regression results provide point estimates of a 1.6 percentage point increase (Column 2) in probability of admission to at least one "Most Competitive, Group 1" college and an 8.9 percentage point increase (Column 3) in probability of admission to at least one "Most Competitive, Group 2" college for students offered telementoring, though neither of these results is statistically significant.

The paradoxical finding in Table A4, however, is that the regression results indicate a negative effect – a reduction of 11 percentage points (Column 3) – of telementoring on admission to any (either group 1 or group 2) "Most Competitive" college. Once again,

this coefficient was not statistically significant. This is surprising because telementoring was estimated to have a small positive effect on admission to group 1 and group 2 colleges separately.

Tables 12a and 12b compares the college options for students offered and not offered telementoring. While students offered telementoring were more likely to be admitted to at least one "Most Competitive, Group 1 college" (35.3% vs. 29.8%), and more likely to be admitted to at least one "Most Competitive, Group 2" college (70.2% vs. 64.7%), they were also more likely not to be admitted to any "Most Competitive" college (35.3% vs. 27.7%). This suggests some clustering of admission outcomes – where students offered telementoring were relatively more likely to be admitted to both a "Most Competitive Group 1" college and to at least one "Most Competitive Group 2" college. This is, in fact the case – students offered telementoring were approximately three times as likely (25.5% vs. 8.5%) to gain admission to college in both "Most Competitive" groups.

Table 12a: College Options at Most Competitive Colleges
For Students Offered Telementoring

	Admitted MC, Group 2	**Not Admitted MC, Group 2**	**TOTAL**
Admitted MC, Group 1	13 (25.5%)	5 (9.8%)	18 (35.3%)
Not Admitted MC, Group 1	15 (29.4%)	18 (35.3%)	33 (64.7%)
TOTAL	28 (54.9%)	23 (45.1%)	51

Table 12b: College Options at Most Competitive Colleges
For Students Not Offered Telementoring

	Admitted MC, Group 2	**Not Admitted MC, Group 2**	**TOTAL**
Admitted MC, Group 1	4 (8.5%)	10 (21.3%)	14 (29.8%)
Not Admitted MC, Group 1	20 (42.6%)	13 (27.7%)	33 (70.2%)
TOTAL	24 (51.1%)	23 (48.9%)	47

Table A5 presents regression analysis results to assess the effect of being "offered counseling" on enrollment to "Most Competitive" colleges. Students offered telementoring are estimated to be 3.5 percentage points more likely to enroll at a "Most Competitive, Group 2" college and 3.5 percentage points more likely to enroll at a "Most Competitive" college overall than students not offered telementoring. Comparing these results to the results in Table A4 and Table 12 this finding suggests that students offered telementoring were somewhat more likely to enroll in a "Most Competitive" college conditional on admission than were students not offered telementoring. All of the point estimates for the effect of an offer of telementoring in Table A5 are small relative to the sample size, and none are statistically significant.

VI. Discussion and Conclusion

This study produces findings that are broadly consistent with the findings of a related pilot study of college counseling conducted in 2006-2007 (Avery, 2010). Each study found that students who were matched with telementors/counselors submitted more applications to "Most Competitive" colleges. This effect was particularly pronounced for less well-known (and less selective) colleges within the set ranked "Most Competitive" by Barron's. Despite the limited sample size, the increase in applications for students offered telementoring to this subgroup of "Most Competitive" colleges was sufficiently large in magnitude to achieve statistical significance. So these studies suggest that high-achieving low-income students do indeed lack information about the set of colleges that are good matches for their accomplishments and interests.

Ordinarily, we would anticipate that the significant difference in application patterns between the two groups of students would result in significant differences in college choices as well. Yet, in terms of ultimate college choices, we find only a small and not statistically significant estimated effect (3.5 percentage points) of telementoring on the probability of enrolling at a "Most Competitive" college. One obvious factor that limited the effect of counseling is that nearly half of the participants offered telementoring either refused this offer or had little substantive contact with their telementors. In addition, the quite different patterns of admission outcomes observed in Tables 12a and 12b (students not offered telementoring were unusually likely to be admitted to exactly one "Most Competitive" colleges) for students offered and not offered telementoring served to minimize the observed effect of telementoring on college choices.

The 2013 "Expanding College Opportunity" (ECO) intervention of mailings that provided application fee waivers and suggested a set of selective colleges for applications yielded much stronger effects on college choices (Hoxby and Turner, 2013) than in this study or the companion study of private college counseling studied in Avery (2010). Although ECO, Avery (2010) and the Amherst telementoring study all targeted "high achieving low income" students, one key difference is in how students were selected for the study. ECO identified students using administrative data from the ACT and the College Board and relatively few of its targeted students applied to out-of-state selective private colleges if they did not receive the intervention. The Amherst telementoring program targets students who were referred by Questbridge, while the private college counseling study conducted by Avery (2010) identified students in New England and New York from a College Board search list provided to Harvard University.

Participants in the Amherst telementoring program are likely not representative of high-achieving low income students around the country, both because they were sufficiently well connected to be nominated for the Questbridge Scholarship and second, because they were quite highly ranked in the Questbridge process. These qualities are borne out by the fact that nearly half of the participants in the current study who were not offered telementoring still enrolled at "Most Competitive" colleges. That level of enrollment in "Most Competitive" colleges is dramatically higher than the national average for high-achieving low-income students. Similarly, the low-income high school students in New England / New York residents in the randomized trial of private college counselors conducted by Avery (2010) all lived in the same state as an Ivy League college (and were

overwhelmingly likely to apply to an Ivy League college) and for that reason are not representative of high-achieving low-income students across the country.

These observations suggest that telementoring might have larger effects than those found in the current study if it targeted a more representative population of low-income students than those currently referred to the Amherst program by Questbridge. This suggests the more general lesson that the method of identification of students can limit or enhance the observed effect of that program in an evaluation. That is, counseling, mentoring, and application advice is likely most effective when it is delivered to students who are unlikely to choose a selective college without it.

References

Avery, Christopher (2010), "The Effects of College Counseling on High-Achieving, Low-Income Students", NBER working paper 16359.

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Hoxby, Caroline and Sarah Turner (2013), "Expanding College Opportunities for High-Achieving, Low-Income Students", working paper, Stanford Institute for Economic Policy Resarch.

Pallais, Amanda and Sarah Turner (2006), "Opportunities for Low-Income Students at Top Colleges and Universities: Policy Initiatives and the Distribution of Students," National Tax Journal 59:357-386.

Table A1. Regression Results: Determinants of Number of Applications

	(1)	(2)	(3)	(4)
Dependent Variable	Apps	MC Apps	MC_1 Apps	MC_2 Apps
Offered Telementor	0.76	0.90	0.03	0.87**
	(0.65)	(0.67)	(0.53)	(0.33)
SAT Combined	0.001	0.006 **	0.006 **	0.000
	(0.003)	(0.003)	(0.002)	(0.001)
GPA	3.24*	5.81 **	3.98 **	1.83*
	(1.79)	(1.86)	(1.46)	(0.92)
Asian	2.26**	2.24 **	1.27 *	0.97**
	(0.85)	(0.88)	(0.69)	(0.44)
African American	0.50	1.37	1.14	0.23
	(1.20)	(1.24)	(0.98)	(0.62)
Hispanic	0.21	1.09	1.01	0.08
	(0.90)	(0.94)	(0.74)	(0.46)
Male	0.17	0.44	0.67	-0.23
	(0.67)	(0.69)	(0.54)	(0.34)
Income <= $30,000	-0.08	0.26	0.66	-0.40
	(0.68)	(0.71)	(0.56)	(0.35)
One Parent				
Graduated College	0.19	0.24	-0.10	0.33
	(0.91)	(0.94)	(0.74)	(0.47)
Constant	-8.57	-28.7 **	-22.6 **	-6.10
	(7.62)	(7.92)	(6.22)	(3.92)
Observations	78	78	78	78
R-squared	0.20	0.30	0.26	0.23

Excludes applicants who were admitted through formal Early Decision programs.

Standard errors in parentheses
* significant at 1%; ** significant at 5%

Table A2. Regression (Probit) Results:
Determinants of Application to "Most Competitive" Colleges

	(1)	(2)	(3)
Dependent Variable	Applied MC	Applied MC1	Applied MC2
Offered Telementor	.096	-.105	.275**
	(.067)	(.107)	(.100)
SAT Combined	.0007**	.0018**	.0006
	(.0003)	(.0005)	(.0004)
GPA	.169	.649**	.526*
	(.151)	(.284)	(.282)
Asian	.168**	.212	.326**
	(.060)	(.119)	(.097)
African American	.114*	.314**	.149
	(.042)	(.078)	(.130)
Hispanic	.051	.252**	.032
	(.061)	(.106)	(.120)
Male	.024	.075	-.111
	(.069)	(.112)	(.111)
Income <= $30,000	.020	.180	-.092
	(.065)	(.112)	(.104)
One Parent Graduated College	-.051	-.047	.158
	(.143)	(.192)	(.139)
Observations	97	97	97
Pseudo R-squared	0.26	0.23	0.20

This table reports the results of Probit regressions with coefficients reported in probability units of estimated effect of a one unit deviation in each variable from sample mean values.

Standard errors in parentheses
* significant at 1%; ** significant at 5%

Table A3. Regression Results: Determinants of Number of Admits

	(1)	(2)	(3)	(4)
		MC	MC_1	MC_2
Dependent Variable	Admits	Admits	Admits	Admits
Offered Telementor	0.23	0.80*	0.24	0.56*
	(0.53)	(0.48)	(0.31)	(0.30)
SAT Combined	-0.000	0.004**	0.002*	0.002*
	(0.002)	(0.002)	(0.001)	(0.001)
GPA	1.09	3.35**	1.16	2.20**
	(1.46)	(1.32)	(0.86)	(0.84)
Asian	1.35*	1.46**	0.55	0.91**
	(0.69)	(0.62)	(0.41)	(0.39)
African American	1.14	1.66*	0.72	0.94*
	(0.97)	(0.88)	(0.57)	(0.56)
Hispanic	0.72	1.59**	0.79*	0.79*
	(0.73)	(0.67)	(0.43)	(0.42)
Male	0.12	0.30	0.28	0.02
	(0.54)	(0.49)	(0.32)	(0.31)
Income <= $30,000	-0.31	-0.06	0.05	-0.11
	(0.55)	(0.50)	(0.33)	(0.32)
One Parent				
Graduated College	-0.71	-0.40	-0.43	0.02
	(0.74)	(0.67)	(0.44)	(0.42)
Constant	0.00	-18.01**	-7.19 *	-10.80**
	(6.20)	(5.63)	(3.66)	(3.56)
Observations	78	78	78	78
R-squared	0.08	0.24	0.12	0.23

Excludes applicants who were admitted through formal Early Decision programs.
Standard errors in parentheses
* significant at 1%; ** significant at 5%

Table A4. Determinants of number of Admission and Enrollment at Most Competitive Rank

	(1)	(2)	(3)
Dependent Variable	Admitted to "Most Competitive"	Admitted to "Most Competitive, Group 1"	Admitted to "Most Competitive", Group 2
Offered Telementor	-.114	.016	.089
	(.101)	(.099)	(.109)
SAT Combined	.002**	.001**	.001*
	(.0004)	(.0004)	(.0004)
GPA	.324	.293	.789**
	(.261)	(.273)	(.364)
Asian	.251*	.072	.343**
	(.107)	(.140)	(.131)
African American	.187	.421**	.122
	(.116)	(.195)	(.190)
Hispanic	.217*	.361**	.065
	(.103)	(.145)	(.142)
Male	-.027	.088	-.081
	(.109)	(.105)	(.120)
Income <= $30,000	.038	.109	-.120
	(.106)	(.105)	(.116)
One Parent Graduated College	-.156	-.158	.142
	(.185)	(.119)	(.170)
Predicted Probability at X-Bar	.712	.293	.527
Observations	97	97	97
Pseudo R-squared	0.18	0.13	0.14

This table reports the results of Probit regressions with coefficients reported in probability units of estimated effect of a one unit deviation in each variable from sample mean values.

Standard errors in parentheses
* significant at 1%; ** significant at 5%

Table A5. Determinants of Enrollment at Most Competitive Rank

	(1)	(2)	(3)
Dependent Variable	Enrolled "Most Competitive"	Enrolled "Most Competitive, Group 1"	Enrolled "Most Competitive", Group 2
Offered Telementor	.035	-.008	.032
	(.113)	(.090)	(.087)
SAT Combined	.002	.002**	.000
	(.0005)	(.0004)	(.0004)
GPA	.354	.071	.333
	(.310)	(.244)	(.292)
Asian	.269*	.116	.133
	(.140)	(.137)	(.126)
African American	.245	.419*	-.071
	(.182)	(.219)	(.152)
Hispanic	.330**	.415**	-.055
	(.134)	(.148)	(0.109)
Male	.071	.032	.052
	(.120)	(.095)	(.093)
Income <= $30,000	.093	.087	-.005
	(.122)	(.096)	(.092)
One Parent Graduated College	-.306*	-.189	-.057
	(.149)	(.081)	(.116)
Predicted Probability at X-Bar	.505	.297	.219
Observations	97	97	97
Pseudo R-squared	0.19	0.19	0.07

This table reports the results of Probit regressions with coefficients reported in probability units of estimated effect of a one unit deviation in each variable from sample mean values.

Standard errors in parentheses
* significant at 1%; ** significant at 5%