Evaluating the Effectiveness of Upward Bound Programs

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Introduction/Background

Four thousand, eight hundred nineteen dollars. That is the average cost to serve a student in Upward Bound (ED, 2008). Since 1966, the federally funded program has been designed to prepare first-generation college-bound high school students for post-secondary education. While there has been support for Upward Bound, it has not been without opposition. Questions remain as to whether or not Upward Bound is a sound investment of funding in achieving its desired results: every student having the opportunity to pursue a post-secondary education. This study examined data of a nationally represented sample of students who were enrolled in Upward Bound as well as a sample who shared similar characteristics but did not participate to determine the effectiveness of the program.

Upward Bound has been involved in several evaluations to determine program effectiveness. The Department of Education’s Office of Post-Secondary Education (2008) evaluates the program based on the increase of low-income, first-generation college students who successfully pursue postsecondary education opportunities. Upward Bound attempts to achieve the national program goal by adhering to the following objectives (Pyecha & Berls, 1976): increasing the rate of high school graduation, increasing the rate of post-secondary enrollment, and generating skills and motivation necessary for students to succeed in education beyond high school.

Studies have contained a myriad of designs including an evaluation using a pre/posttest comparing Upward Bound student performance, motivation, and self-esteem levels (Hunt, 1967), a mixture of interviews/mailed questionnaires to administrators whose high schools contained Upward Bound students (McCalley, 1969), and data gathered through interviews, academic records, and questionnaires from students involved in Upward Bound compared to those not involved (Burkheimer, 1976; Moore, 1997; Myers & Schrim, 1999). These studies found concurrent evidence that Upward Bound was successful at improving self-esteem, motivation towards pursuing post-secondary education, and post-secondary enrollment.

However, studies also indicate that involvement in Upward Bound has not significantly impacted student academic achievement. A factor that contributes to this disconnect is vague language that originally defined core class curriculum for program grant applications. This resulted in students being placed in summer
courses that were not parallel to high school classes or were not reflective of subject proficiency (Gordon & Jabolonsky, 1967; James, 1979; Staats, 1974). Research has also revealed that measuring academic achievement for students enrolled into the Upward Bound program has been difficult. Each chapter varies in terms of students served and implementation of strategies (Burkheimer, 1976). Since each chapter serves the needs of the target population, different concerns are addressed. Some chapters may have students struggling to graduate high school due to limited proficiency in English while other students may have insufficient counseling services available.

Concerns have arisen about the ethicality of using a design with a control and treatment group for this program (Pell Institute, 2002). Subjects are students whose lives could benefit by Upward Bound participation, and without said treatment the future livelihood of the student could be seriously impacted (Field, 2007). Previous evaluations were unable to address all objectives. Hunt’s (1967) process evaluation included only results of students that participated in Upward Bound by comparing pre/posttest responses. Greenleigh Associates’ (McCalley, 1969) investigated student progress via individual responses through the students’ first year at a college or university, not retention or matriculation. Burkheimer’s (1976) study chose high school in the community as the Upward Bound treatment group and the other for the control with results being between-differences since the groups were from two different samples and not the same. Mathematica’s study contained nearly 15% of students in the comparison group reported as participating in either a Classic or Math/Science Upward Bound (Seftor, Mamsun, & Schirm, 2009). Thus, a study is needed that will observe matriculation rates of low income and first-generation students and determine whether or not a program has been designed that will enable success in post-secondary educational opportunities.

**Theoretical Framework**

Because Upward Bound is a federal program, it is evaluated from both an effectiveness and an impact approach. These programs often have very strict budgets with limited funding. Policymakers desire to ensure that all monies invested will produce the greatest impact, and want clear and concise data to support their decisions. Since these approaches are used currently to determine whether or not Upward Bound should remain funded, both tenets of impact and effectiveness evaluation will be used as the framework for this study.
Objective

The purpose of this study was to determine the effectiveness of Upward Bound programs in terms of increasing the percentage of targeted high school students who successfully pursue postsecondary education opportunities. Retention rates of a nationally representative sample of students who had participated in Upward Bound activities between 1988 and 1992, enrolled in post-secondary education, and remained until matriculation were explored. To determine the extent to which the aforementioned objectives for Upward Bound programs were met, the following research questions were addressed: does the number of years a student is enrolled in Upward Bound predict the rate of high school graduation, post-secondary application and enrollment, financial aid application, and/or post-secondary institution graduation? After controlling for the independent variables (parent/guardian level of education, family income, gender, ethnicity, and remedial course participation), it was hypothesized that participation in Upward Bound will increase the likelihood of all of these outcomes.

Methodology

This study was quasi-experimental and conducted using pre-existing, publicly-available data from the National Educational Longitudinal Survey 1988:2000 (NELS:88/2000). Binomial logistic regression tests were conducted to observe whether or not Upward Bound participation could predict the values of dependent variables. After data was checked for consistency, a logistic regression test was conducted on the independent variables to predict Upward Bound membership. Using the probabilities to create a propensity score, a comparison group was created using the closest-neighbor method. An Upward Bound student’s score is matched with the first student of the remainder of the sample with the same value. Since propensity scores are the conditional probability of treatment given observed covariates, these values will eliminate possible bias, and increase precision (D’Agostino, 1998). Scores were rounded to the nearest thousandth and then assigned a randomized identifier. Records were sorted by value, Upward Bound participation, and identifier, eliminating possible selection bias. The comparison group helps explain what possible outcomes could result of a student with similar characteristics as a student in Upward Bound who had not been able to participate.

Although measures were taken to match background characteristics of Upward Bound students with the comparison, neither group predicted for Upward Bound assignment when comparing the independent
variables. Thus, it appears even more difficult to determine which students are the best candidates for Upward Bound. Nonetheless, even though a student had at most a probability of nearly 29% of being assigned to Upward Bound, the scores for students in both groups were almost identical when selected for analysis. After the comparison group was created, binary logistic regression tests (α < 0.1) were conducted to determine possible predictions as well as the odds ratio to determine effect size.

**Data Sources**

The data file consists of students who were randomly surveyed in 1988 as 8th graders, with follow-ups in 1992, 1994, and 2000. Prior research has shown that the longer a student remains in Upward Bound, the higher the rate of impact on the student in regards to post-secondary education (Myers & Schirm, 1999). Approximately 150 students were identified as participants of Upward Bound. Students with similar characteristics were also selected (N_upward_bound = 148, N_comparison = 148). The data sample was large enough to produce an accurate effect size, n = 30 (Cohen, 1992), as well as representative of the population: 1.23% of the NELS sample were identified as enrolled in Upward Bound which is similar to the proportion of students enrolled in Upward Bound in 1990 (Moore, 1997; U.S. Census, 1990).

**Results**

Overall, Upward Bound participation was able to predict an increased likelihood of post-secondary application ($\chi^2(2) = 21.010, p < 0.1$), financial aid application ($\chi^2(2) = 25.347, p < 0.1$), post-secondary enrollment ($\chi^2(2) = 11.460, p < 0.1$) and post-secondary education graduation/retainment ($\chi^2(2) = 7.301, p < 0.1$) than not participating. In fact, participation in Upward Bound was twice as likely to increase the likelihood of the above outcomes.

Each year of Upward Bound enrollment increased the likelihood of post-secondary application ($\chi^2(3) = 32.005, p < 0.1$), financial aid application($\chi^2(3) = 30.949, p < 0.1$), and post-secondary enrollment ($\chi^2(3) = 23.250, p < 0.1$). Achieving these outcomes was twice as likely for every year a student participated in Upward Bound.

**Significance**

Similar to past evaluations (Hunt & Hardt, 1967; McCalley, 1969; and Burkheimer, 1976) this study supports the claim that Upward Bound students are likely to apply for post-secondary education and eventually
enroll. Compared to national statistics, there was a significant difference in the rate of high school graduation between students that participated in Upward Bound and the national population (98% vs. 75%, Snyder, 1992), as well as in the rate of post-secondary enrollment (97% vs. 82%, Snyder, 1992). Given prior studies that indicate that the target population that Upward Bound serves tends to have lower educational outcomes than their counterparts, the results are even more significant (Orfield et al., 2004).

From both an impact and an effectiveness approach outcome evaluation, Upward Bound is an effective program. Research suggests that Upward Bound participation results in a difference of results than from not participating. By realizing the impact that Upward Bound can have on these students, policymakers can argue for increased funding to serve more students. The objective that Upward Bound participation would increase applying for post-secondary education was supported. Students that participated in Upward Bound were twice as likely to apply for post-secondary education. Also, students that participated in Upward Bound were twice as likely to graduate from a post-secondary institution, further demonstrating the necessity for students to have opportunities to participate in Upward Bound in which the national post-secondary dropout rate is 50% or greater depending on the ethnicity of the student (Nathanson, 2001).

Based on the results of this study, some may surmise that the number of years a student participates in Upward Bound is irrelevant and argue for the best cost-benefit analysis where one year of participation is enough treatment for a student to achieve the objectives set by the program. However, despite one year of participating in Upward Bound it is highly unlikely that the low-income or first-generation status would be removed, thus the same barriers to achieving a post-secondary education remain. It would be difficult to determine which year is the most crucial for a student to participate in Upward Bound during high school that will cause the greatest likelihood of high school graduation, post-secondary enrollment, and post-secondary graduation.

This study chose the comparison group based on matching characteristics with Upward Bound participants and is only a quasi-experimental study. Any generalizations that may arise from the results should be approached cautiously. Since it is unknown whether or not these students represent a diverse population in terms of location, it is impossible to suggest any form of causality without repeating the study using a representative sample. In order for a student to become a member of Upward Bound, a student must
demonstrate the “will to achieve” by displaying interest in participating, applying to join the program, and being accepted by the local chapter. Thus, every study involving Upward Bound could contain a possible selection bias based on how the students are assigned.

In conclusion, this study was able to support the claim that Upward Bound was an effective program based on its abilities to increase the percentage of low-income, first-generation college students who successfully pursue postsecondary education opportunities; as well as the Upward Bound program objectives. Hopefully the results of this study will encourage similar studies to be conducted, providing enough supporting evidence that Upward Bound is not only effective in increasing the ability for a student to achieve a post-secondary education but also that adequate funding can be allocated so that every eligible student across the nation can participate, and not just a select few.
References


