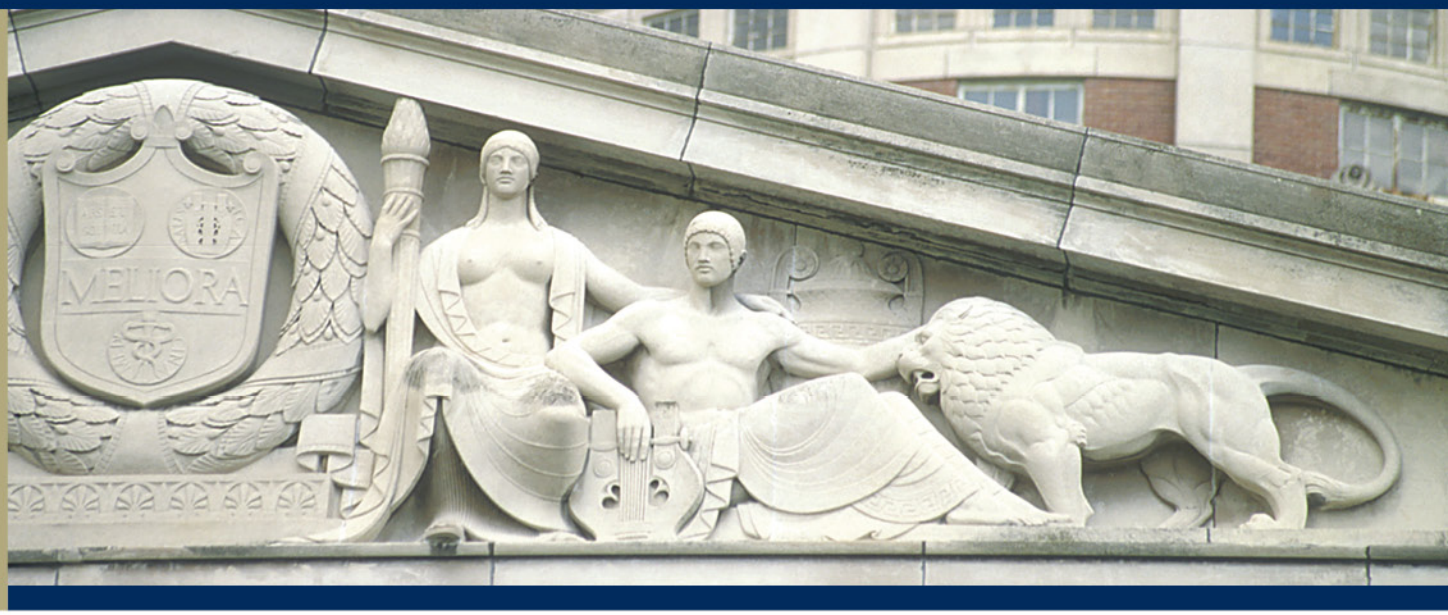

The Hillside Work-Scholarship Connection Benefit-Cost Ratio Analysis

November 2015

WARNER
SCHOOL OF EDUCATION
UNIVERSITY of ROCHESTER

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FOR PROFESSIONAL DEVELOPMENT & EDUCATION REFORM

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The Hillside Work-Scholarship Connection Benefit-Cost Ratio Analysis

Benefit-Cost Ratio Analysis Report
November 2015

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INTRODUCTION

Hillside Work Scholarship Connection (HW-SC) was created in 1987 by the Wegmans Food Markets. In the mid 90's, HW-SC became an affiliate of the Hillside Family of Agencies with Wegmans continuing as their key partner, philanthropic funder, and with service on their Board. The HW-SC aims to provide high-risk high school students with academic support and mentoring, life skills and workforce training, and employment opportunities to improve their chances of graduating from high school, college and career ready, and enrolling in post-secondary education. This report provides the Hillside Family of Agencies with an external, independent evaluation of its HW-SC program. The evaluation consists of a cost-benefit analysis that quantifies the return on investment associated with the HW-SC program.

This report provides benefit-cost ratios for three groups, including: 1) all Hillside-eligible participants (the overall group); 2) Hillside-eligible participants who were retained in the HW-SC program (the retained group); and 3) Hillside-eligible participants who completed Hillside's Youth Employment Training Academic (YETA) program and were employed with a Hillside employment partner during high school (YETA/employed group). For the three groups, we also calculated benefit-cost ratios by gender by racial/ethnic group (i.e., African American females,

African American males, Hispanic females, and Hispanic males).[1] In addition to the benefit-cost ratios, we provide a sensitivity analysis that examines how different assumptions with regard to the outcomes, benefits, and costs associated with the HW-SC program would change our results and by how much. Finally, we provide information regarding the non-financial benefits of educational attainment.

METHODS

Cost-Benefit Analysis

In simple terms, a cost-benefit (CB) analysis compares the costs and benefits associated with a program, both expressed in discounted monetary terms. Benefits are derived from the differences in outcomes between participants in the program and a comparison group of non-participants who are similar to the participants in all other respects. Costs include all program and societal resources devoted to achieving the outcomes. If the discounted monetary value of the benefits exceeds the discounted monetary value of the costs, the return on investment of the program is positive. If the discounted monetary value of the benefits falls below that of the costs, the return on investment is negative (Levin & McEwan, 2001). An important limitation of CB analysis is only benefits that can be measured in monetary terms are included in the comparison, which can result in an underestimation of the benefits and, hence, return on investment of a program.

[1] In some cases, including White females and White males, the sample sizes by gender and race/ethnicity became too small (less than 10) for the postsecondary enrollment outcomes to calculate reliable benefit-cost ratios.

The results of a CB analysis can be calculated and reported in multiple ways (Levin & McEwan, 2001). In this report, we utilize the benefit-cost ratio, which is the ratio of the discounted value of benefits over the discounted value of costs. This ratio is simple to understand because it reveals how many dollars of benefit are expected to result per dollar invested. A benefit-cost ratio greater than 1.00 indicates a positive return (i.e., benefits exceed costs), whereas a ratio at or below 1.00 indicates a break-even or negative return, respectively. All monetary values for this report were converted to 2014 dollars using the Consumer Price Index for all urban consumers in the U.S. (U.S. Bureau of Labor Statistics, n.d.).

The benefits associated with programs like HW-SC that seek to increase the skills and educational attainment of high-risk youth accrue to different groups, including the participants themselves and society at large. Similarly, the costs are borne by different groups. As a result, multiple benefit-cost ratios often are calculated and reported to reflect the returns to those who bear the costs and accrue the benefits (Levin & McEwan, 2001). Herein, we report three benefit-cost ratios:

(1) Total benefit-cost ratio—based on all benefits and costs;

(2) Private benefit-cost ratio—based only on the benefits and costs that accrue to or are the responsibility of participants in the HW-SC program; and

(3) Social benefit-cost ratio—based only on the benefits and costs that accrue to or are the responsibility of the greater society, including Hillside.

DATA

The data used to assess the HW-SC program outcomes and costs for this CB analysis were provided by the Hillside Family of Agencies (Hillside) and include Hillside-identified eligible participants from the 2010 freshman cohorts from three upstate New York urban school districts (except where noted): Buffalo, Rochester, and Syracuse. The data identified each participant's gender, race/ethnicity, extent of participation in the HW-SC program, high school hours of employment and earnings with a Hillside employment partner (if applicable), total cost of the program, high school outcome (i.e., dropout, on-time graduate, still in school), and, for graduates, plans to attend a postsecondary institution. As noted earlier, we used this information to calculate benefit-cost ratios for three HW-SC groups – overall, retained, and YETA/employed – as well as by gender by racial/ethnic group.

A number of additional data sources were identified and used to calculate comparison group outcomes, the discounted monetary value of the benefits associated with the outcomes, and the discounted monetary value of the costs of attaining the outcomes. These sources are identified where appropriate in the Findings section.

FINDINGS

In this section, we first report the effects, benefits, costs, and benefit-cost ratios for all HW-SC participants from the three groups of interest (i.e., overall, retained, YETA/employed). We then report the same information by gender by racial/ethnic group. We follow the section with a sensitivity analysis of the results for the HW-SC participants overall.

Effects of the HW-SC Program

As noted earlier, the HW-SC program aims to improve the academic and job readiness skills and educational attainment of high-risk high school students who participate in the program. In this report, the effects of the program were determined by calculating the differences in measurable outcomes between the 2010 cohort of HW-SC participants from the Buffalo, Rochester, and Syracuse city school districts, and all students in the 2010 entering freshman cohorts in the same three districts (henceforth, districts or district students).

The outcomes that we were able to measure include the difference in the percentages of students employed during high school; the difference in on-time high school graduation rates, with on-time for the 2010 cohort meaning by August, 2014; and the difference in postsecondary enrollment rates. Additional potential outcomes

associated with the HW-SC program, such as improved academic and job readiness skills, were not considered due to a lack of available measures of these outcomes.

Employment during high school. The Hillside data included information for all three district programs regarding HW-SC participant employment with Hillside-partner employers. Because no comparable employment data were available for Buffalo, Rochester, and Syracuse district students, we used 2013 national data that showed the percentage of youth by race/ethnicity who were employed while enrolled in high school (Child Trends Databank, 2014). To calculate the employment percentage for district students from these national data, we used the racial/ethnic distribution of each district's cohort to create a weighted average employment rate for all three districts combined. Figure 1 shows the HW-SC participant and district student employment rates. By definition, 100% of the HW-SC participants in the YETA/employed group were employed during high school. Moreover, HW-SC participants who were retained in the program were employed at a higher rate than HW-SC participants overall (35% vs. 26%). Also revealed in Figure 1, there were notable differences in high school employment rates between HW-SC participants and district students (15%, 24%, and 89% higher employment rates for the overall, retained, and YETA/employed groups, respectively).

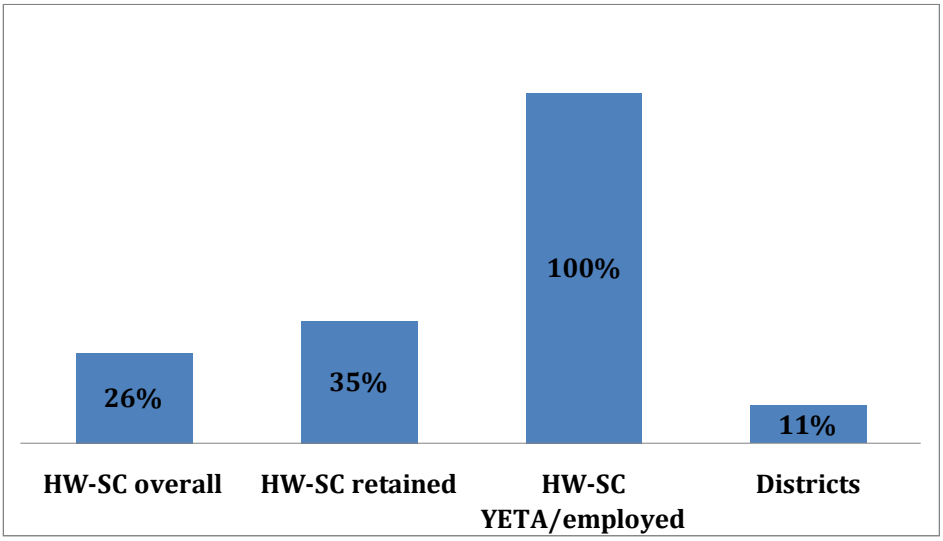

Figure 1. Employment rates during high school for HW-SC participants by group and for districts.

On-time high school graduation. The Hillside data included on-time graduation information for all three district programs by HW-SC participant. Comparable on-time graduation rate data for the Buffalo, Rochester, and Syracuse districts were obtained from the New York State Education Department (NYSED, n.d.b, p. 8). The three, separate district rates were combined into an overall district rate using district cohort size to create a weighted average. The HW-SC participant and combined district on-time graduation rates are shown in Figure 2. As with high school employment, HW-SC participants who were more engaged with the program showed higher on-time high school graduation rates. In addition, HW-SC participants in all three groups (overall, retained, and YETA/employed) exceeded the combined district graduation rate by 11%, 31%, and 41%, respectively.

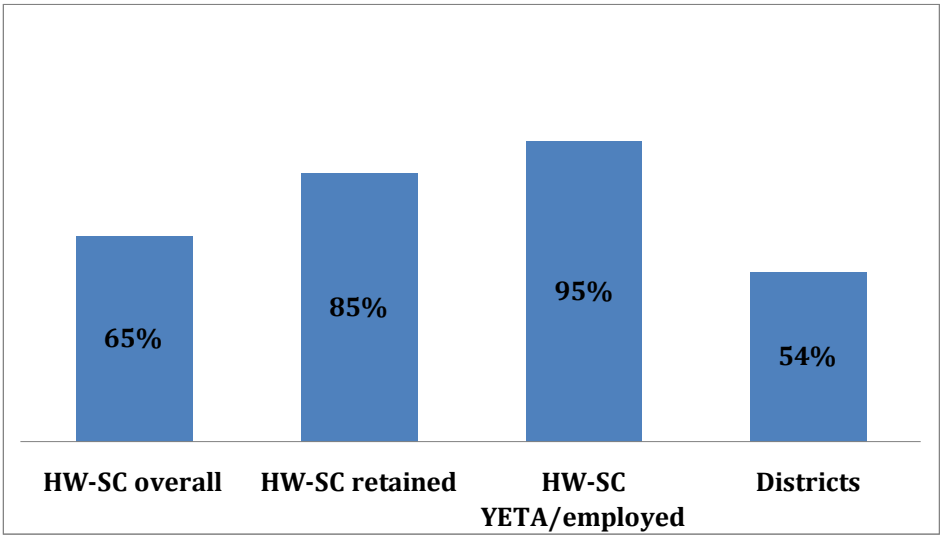

Figure 2. On-time high school graduation rates for HW-SC participants by group and for districts.

Postsecondary enrollment. Postsecondary enrollment in this report refers to enrollment in any type of postsecondary institution in the year following high school graduation. The Hillside data included postsecondary enrollment information only for HW-SC participants who graduated from high school and whose parent or guardian provided written consent for the participant to share the information. As a result of the latter condition, postsecondary enrollment information was available only for a subset of HW-SC participants from Rochester and Syracuse. No parental consent was obtained for HW-SC participants from Buffalo.[2] Thus, the postsecondary enrollment rates for HW-SC participants used herein exclude outcomes for Buffalo and are based only on a subset of Rochester and Syracuse participants. Comparable postsecondary enrollment rate data for the Rochester and Syracuse districts were obtained from a New York State report

[2] Parental consent was obtained for 70%, 74%, and 78% of the overall, retained, and YETA/employed HW-SC participants from Rochester, respectively. The corresponding percentages for Syracuse were 48%, 51%, and 52%.

prepared by researchers from the Strategic Data Project (n.d.) in which a national postsecondary enrollment database was used to determine district-level postsecondary enrollment rates for the 2008 cohort of high school students. As shown in Figure 3, HW-SC participants who graduated from high school and were most engaged with the program during high school showed a higher level of postsecondary enrollment than those who were not as engaged (66%, 66%, and 80% for the overall, retained, and YETA/employed groups, respectively). Moreover, HW-SC participants who graduated from high school registered higher postsecondary enrollment rates than students in the districts overall (59%). For the three groups, the differences between HW-SC participants and district students were 7%, 7%, and 21%, respectively.

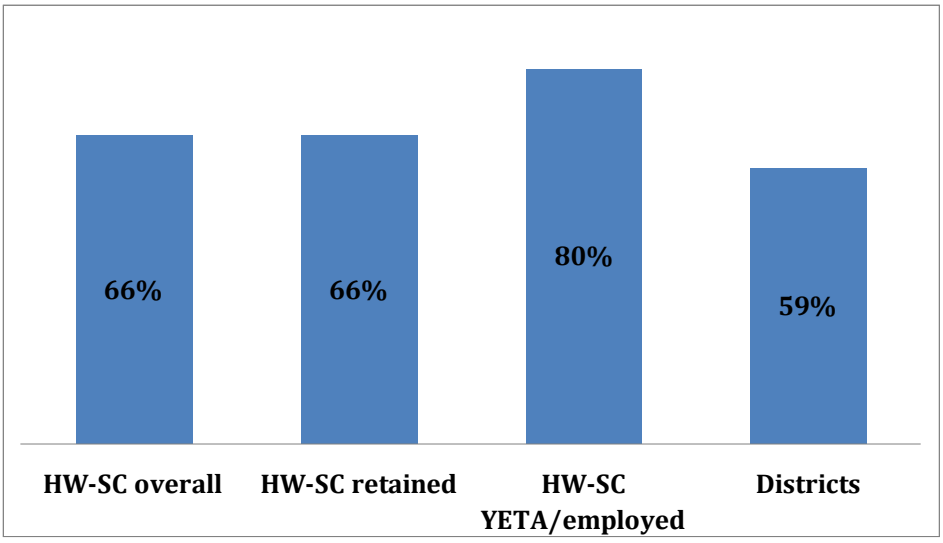

Figure 3. Postsecondary enrollment rates for HW-SC graduates by group and for districts.

Benefits Associated with HW-SC Participation

The differences in outcomes described in the previous section are expected to lead to monetary benefits for both HW-SC participants and society as a whole on account of the higher levels of employment and education attained. Here, we describe how we calculated the discounted value of these monetary benefits.

Increase in earnings during high school. As shown in Figure 1, compared to district students, greater percentages of HW-SC participants worked during high school. Based on the differences in employment rates, we calculated an estimate of the additional earnings of HW-SC participants during high school. Information regarding hourly wages and number of weeks worked for the HW-SC participants was provided by Hillside. For district students, we did not have similar employment information, so we assumed that they worked the same number of weeks and hours per week as HW-SC participants and earned the federal minimum wage (i.e., $7.25 per hour) (U.S. Department of Labor, n.d.). Using this information, we calculated the average difference in wages earned during high school for each of the three HW-SC groups. As Figure 4 shows, employment during high school generated additional monetary benefits for HW-SC participants compared to district students of $1,370, $2,310, and $8,412 per participant for the overall, retained, and YETA/employed groups, respectively.

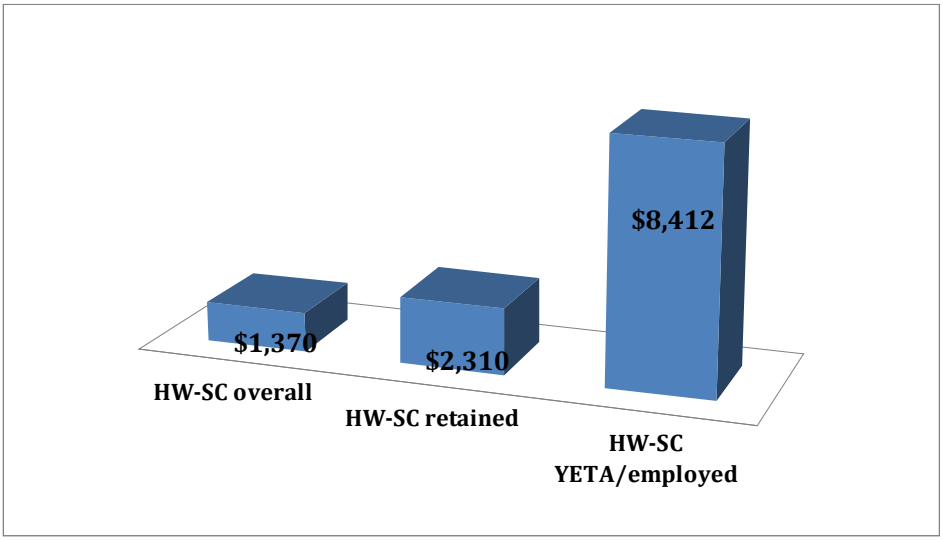

Figure 4. Increase in earnings during high school from HW-SC participation.

Increase in lifetime earnings. It is well documented that, on average, individuals with higher levels of educational attainment earn significantly more during their lifetimes than those with lower levels of educational attainment (see, e.g., Baum, Ma, & Payea, 2013). As shown in Figures 2 and 3 above, HW-SC participants demonstrated both higher on-time high school graduation rates and, conditional on having graduated, higher postsecondary enrollment rates than district students. Using lifetime earnings estimates by educational attainment level for all workers (U.S. Department of Commerce, 2011), we calculated the differences in expected lifetime earnings for high school graduates compared to high school dropouts and for those with some college compared to high school graduates, adjusted to $2014. These differences, which directly benefit the individuals who attained the higher levels of education, are shown in Figure 5.

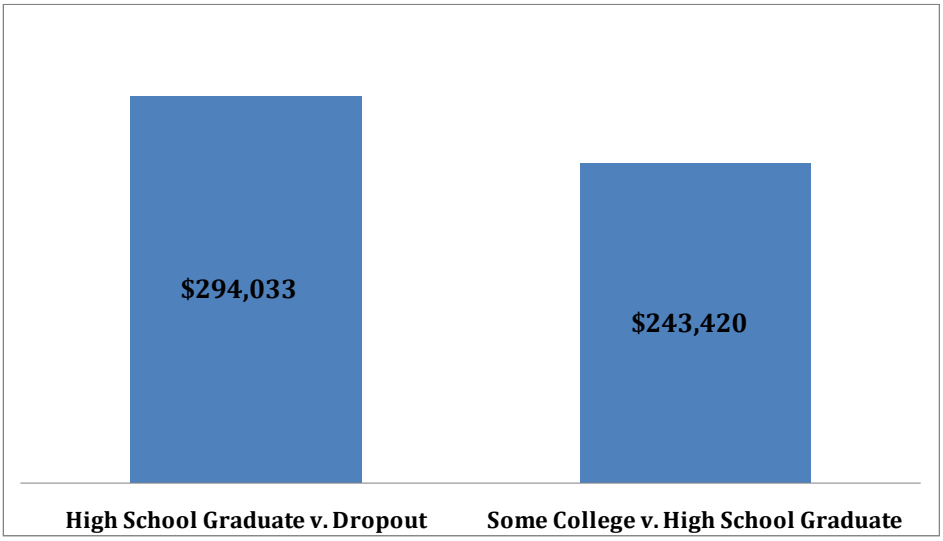

Figure 5. Increase in lifetime earnings by educational attainment.

Increase in tax revenues. Individuals who earn more also generally pay more taxes. The increase in tax revenues generated by higher earnings provides a benefit to society. Belfield and Levin (2007) estimated the additional tax revenues for "expected high school graduates" (Levin & Belfield, 2009, p. 17), which they defined as high school graduates from the bottom quartile of high school achievement for whom the probability of college enrollment and completion are incorporated in their estimates. Put more simply, their calculations are based on educational attainment estimates for low-performing individuals who are high school graduates and above, compared to high school dropouts. According to Belfield and Levin (2007), the expected increase in tax revenues amounts to $174,325 in $2014 per expected high school graduate over their lifetime (see Figure 6).

Other social benefits. It also is well documented that individuals with higher educational attainment are less likely to require public assistance, such as Medicaid/Medicare and welfare, and are less likely to become involved in the criminal justice system (Belfield & Levin, 2007). Like they did for tax revenues, Belfield and Levin (2007) estimated the social benefits in terms of average cost savings per expected high school graduate associated with their lower usage of these services. The total expected lifetime savings per graduate, which is a benefit to society, is estimated to be $87,852 in $2014 (see Figure 6).

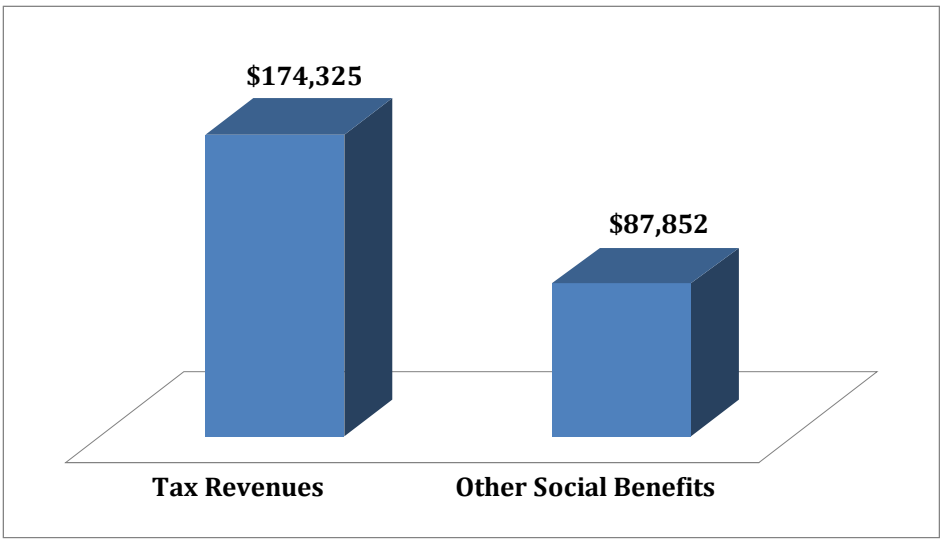

Figure 6. Social benefits associated with higher educational attainment.

Costs Associated with HW-SC Participation

The HW-SC program itself and the additional educational attainment that it promotes entail costs. Some of these costs are borne by Hillside through its administration of the HW-SC program. Others are borne by the HW-SC participants

and taxpayers through the costs of providing additional high school and postsecondary education. In this section, we provide estimates of these costs.

Costs of the HW-SC program. Information regarding the costs of the program for each HW-SC participant was provided by Hillside. In Figure 7, we show the average cost per participant for each HW-SC group. Costs are higher for the retained and YETA/employment groups on account of the participants' more extensive participation in the HW-SC program.

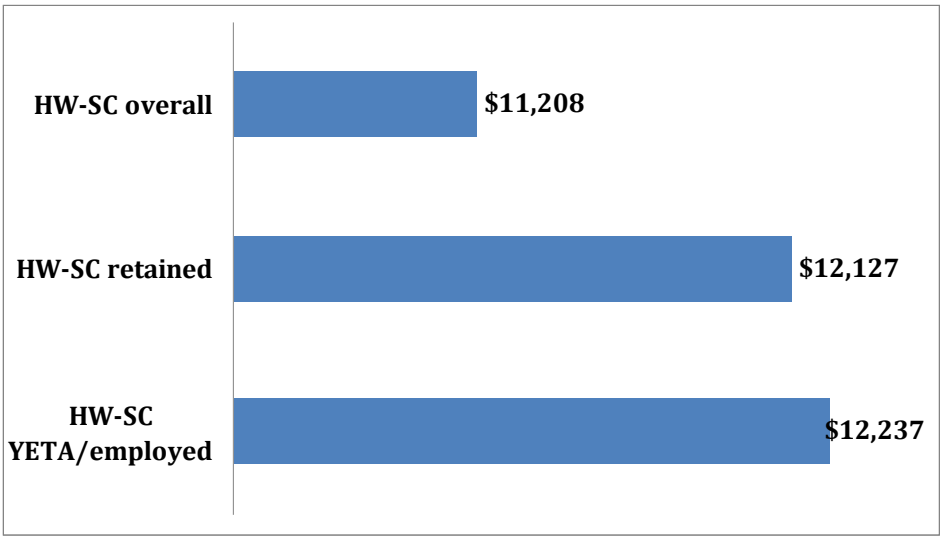

Figure 7. Average Hillside cost per participant of the HW-SC program by group.

Costs of additional years of high school. One aim of the HW-SC program is to improve high-risk students' retention in, and completion of, high school. Earlier in this report, we showed the higher on-time high school graduation rates for HW-SC participants compared to district students from Buffalo, Rochester, and Syracuse. Belfield and Levin (2007) estimated that high school graduates attend two more years of high school, on average, than high school dropouts. We used their

estimate to calculate the additional cost to taxpayers associated with the higher graduation rates of HW-SC participants. For this calculation, we used a weighted average of the per pupil expenditures for all three districts for 2012-2013 (adjusted to $2014) and 2013-2014 (NYSED, n.d.a; The Policy Office, 2015). The average additional social cost (i.e., costs to taxpayers) per graduate of these additional years of high school for each HW-SC group is shown in Figure 8.[3]

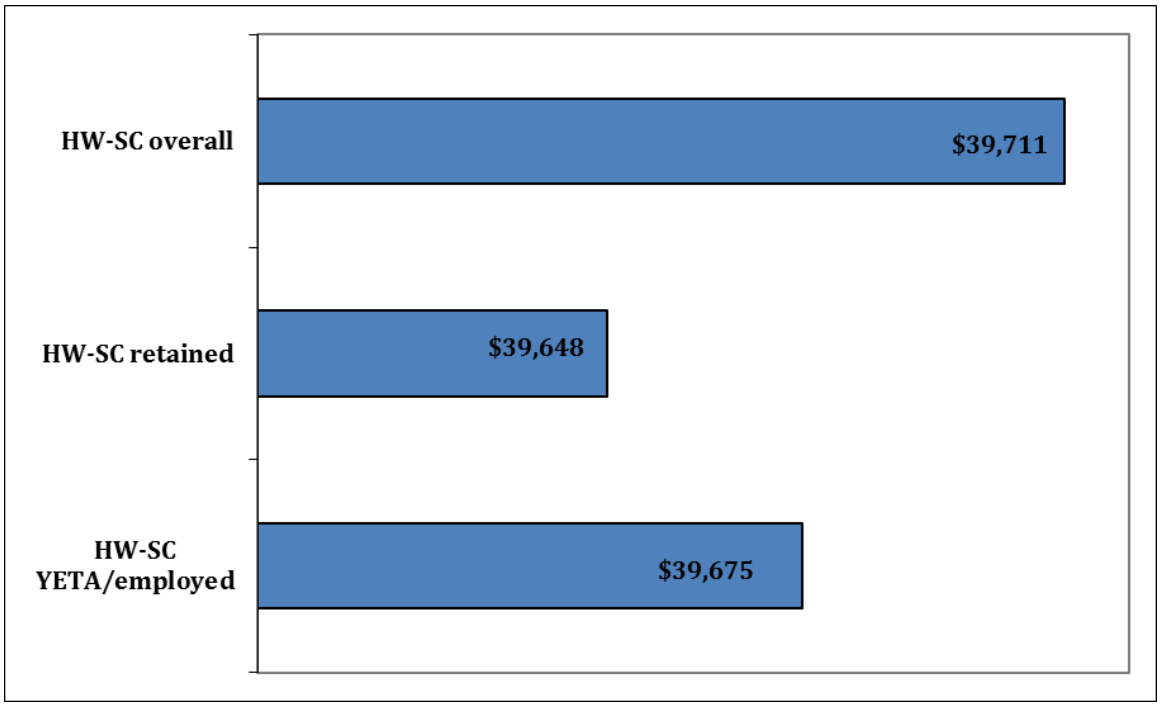

Figure 8. Average social cost per graduate of two additional years of high school by HW-SC group.

Costs of postsecondary education. Enrollment in postsecondary education following graduation from high school has associated costs as well, both to the individuals who enroll and to taxpayers who subsidize the cost of

[3] These costs differ slightly by HW-SC group because the weights used to calculate the combined per pupil expenditures across the three districts are based on the proportions of HW-SC participants from each of the three districts, which vary by group.

postsecondary education. Again, Belfield and Levin (2007) provided an estimate for this calculation. They found that high-risk students like those served by the HW-SC program spend an average of two years in postsecondary education. To construct our calculation, we assumed that the two years are spent in two-year colleges in the counties in which the HW-SC participants graduated from high school. Recall that Hillside did not have postsecondary enrollment information for Buffalo participants. Thus, we used the average tuition and fees for SUNY two-year colleges for 2014-2015 and 2015-2016 (adjusted to $2014) as an estimate of the cost to HW-SC participants who enrolled in college (SUNY, 2015, n.d.). To calculate the social cost of this additional education, we used the average annual state and local contributions for SUNY two-year colleges in Monroe and Onondaga counties for 2014-2015 and 2015-2016 (adjusted to $2014) (NYSUT, 2014, p. 2; SUNY, 2015, n.d.). These private and social costs associated with two years of postsecondary education are shown in Figure 9.[4]

[4] The tuition and fees paid by students do not vary across groups since we used the average rate across SUNY two-year institutions. We assume that the HW-SC graduates who enroll in postsecondary education bear the full cost of tuition and fees. The social costs vary somewhat on account of the fact that the proportions of state and local contributions in Monroe and Onondaga differ, which when subject to slightly different HW-SC participation weights by group causes slight differences in social costs by group.

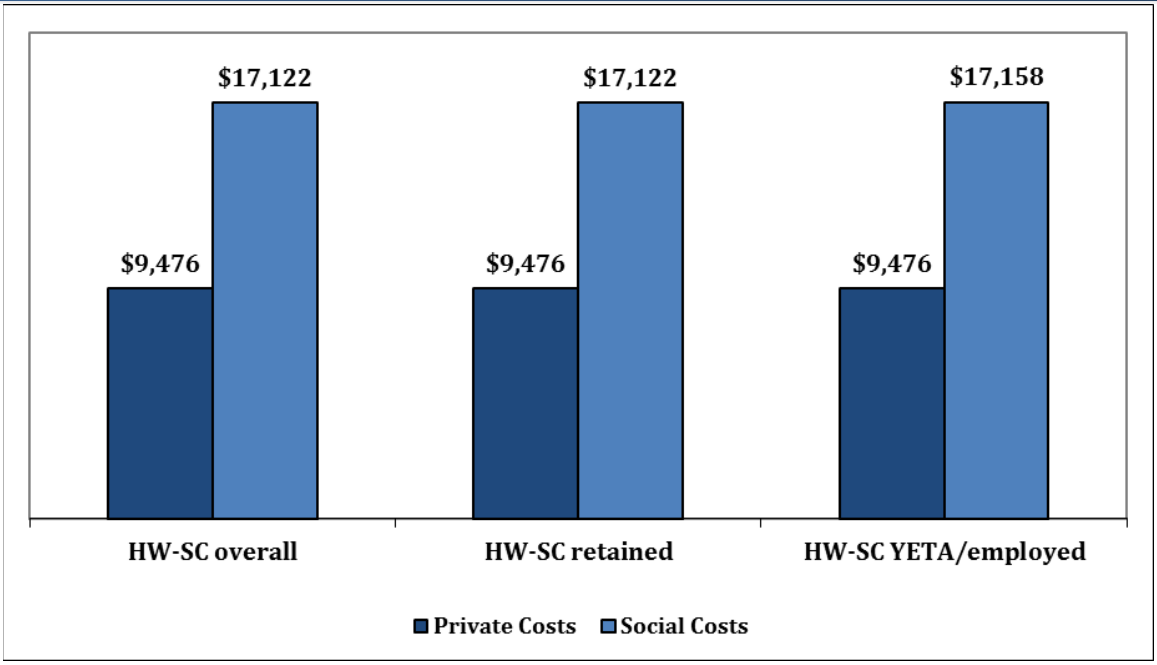

Figure 9. Private and social costs per enrolled student associated with two years of postsecondary education.

Benefit-Cost Ratios

Benefit-cost ratios are calculated by dividing the per HW-SC participant discounted value of the expected benefits from participating in the HW-SC program by the corresponding expected per HW-SC participant discounted value of costs associated with participation. As noted earlier, we calculated three benefit-cost ratios – total, private, and social. The total benefit-cost ratio incorporates the discounted value of all quantifiable benefits and costs associated with the HW-SC program. The private benefit-cost ratio is based only on the benefits and costs that directly affect the participants in the HW-SC program. The social benefit-cost ratio includes only the benefits and costs that directly impact society at large, including Hillside. Table 1 shows these benefit-cost ratios by HW-SC group.

Mathematically, the discounted value of expected benefits from HW-SC participation is the summation across all benefits of the expected dollar value of each of the benefits (in $2014) times the probability of realizing each of the additional monetary benefits on account of improved outcomes. The discounted value of expected costs is calculated similarly using the $2014 cost estimates associated with each outcome and probabilities of achieving each outcome.

As revealed in Table 1, all of the benefit-cost ratios are greater than 1.00, which indicates that the HW-SC program is expected to create positive returns for each group, regardless of who bears the costs and accrues the benefits. For the HW-SC overall group, the total benefit-cost ratio is 4.75, which means that, based on an average HW-SC participant, the program is expected to result in $4.75 of total benefits for every dollar invested. The expected returns are even greater for the HW-SC retained (7.52) and YETA/employed (8.52) groups on account of the better relative outcomes (i.e., higher rates of high school employment and educational attainment) achieved by these groups.

Table 1.

Benefit-Cost Ratios by HW-SC Group

	Benefit-Cost Ratios		
	Total	**Private**	**Social**
HW-SC overall	4.75	56.13	1.64
HW-SC retained	7.52	65.41	2.84
HW-SC YETA/employed	8.52	56.21	2.98

The private benefit-cost ratios are significantly larger than the social benefit-cost ratios. This is due to the fact that HW-SC participants accrue the greatest benefits associated with program participation and higher educational attainment in terms of higher earnings during high school and throughout their lifetimes, but bear substantially lower costs compared to Hillside and society at large. In contrast, society accrues a smaller share of the benefits through higher tax revenues and lower social program costs, but contributes much more to the costs of supporting the participants' additional years of education. Even so, we estimate the social benefit-cost ratio for HW-SC participants overall to be 1.64, which amounts to $1.64 benefit to society for each dollar invested. The corresponding ratios for the HW-SC retained and YETA/employed groups are 2.84 and 2.98, respectively. Moreover, it is important to keep in mind that the quantifiable benefits to HW-SC participants and society included in our calculations fail to take into account many other, more difficult to quantify benefits that have been shown to be associated with higher educational attainment. We consider these additional benefits in a separate section below.

Results by Gender by Racial/Ethnic Group

The results reported above pertain to all HW-SC participants, yet educational outcomes and the benefits associated with higher educational attainment have been shown to vary by gender and race/ethnicity (see, e.g., Belfield & Levin, 2007; NYSED, n.d.b.). In this section, we recalculate the outcomes, benefits, costs, and

benefit-cost ratios by gender by racial/ethnic group for groups for which we could access group-specific data, and for which the sample sizes of HW-SC participants were sufficient to report separately. The groups that we were able to consider in full include African American females, African American males, Hispanic females, and Hispanic males. We show some results for White females and White males, but we were not able to calculate reliable benefit-cost ratios due to their very small sample sizes for the postsecondary enrollment rate outcome. For the same reason, we were not able to calculate reliable benefit-cost ratios for HW-SC YETA/employed Hispanic males.

Effects of the HW-SC program by group. Like we did for HW-SC participants overall, we calculated outcomes and differences in outcomes between HW-SC participants by gender by racial/ethnic group and corresponding students from the Buffalo, Rochester, and Syracuse districts. Moreover, we considered differences by HW-SC overall, retained, and YETA/employed groups. For HW-SC participants, we used the dataset provided by Hillside to calculate each of the outcomes. For district students, we used the same national Child Trends Databank (2014) data described earlier as an estimate for employment rates. Unfortunately, the Child Trends data provided estimates by racial/ethnic group, but not by gender. Thus, we had to assume that females and males within each racial/ethnic group were employed at the same rate during high school. For district students' on-time high school graduation rates, we obtained gender by racial/ethnic group graduation data for each of the three districts via special request from the New York State

Education Department. We then calculated graduation rates for the three districts combined, using the weighted average approach described previously. Postsecondary enrollment rates for the districts were taken from a national report that disaggregated college-going by race/ethnicity (U.S. Department of Education, 2014); group-specific district data were not available. Like the employment rate data for the districts, these estimates are limited by the lack of differentiation by gender.

Table 2 shows results for each of the three outcomes by gender by racial/ethnic group for each of the HW-SC groups and for districts. As expected based on previous research, the outcomes differed for HW-SC gender by racial/ethnic groups. Even so, for nearly all gender by racial/ethnic groups, the outcomes for each HW-SC group exceeded those for the districts, with generally greater differences for HW-SC participants who were more involved in the program (i.e., those in the retained and YETA/employed groups). White female and white male HW-SC participants were the exceptions in that some of their outcomes did not exceed the estimates for the districts.

Table 2.

Outcomes by Gender by Racial/Ethnic and HW-SC Groups and for Districts

	African American Females	African American Males	Hispanic Females	Hispanic Males	White Females	White Males
Employment rate during high school						
HW-SC overall	35%	19%	30%	18%	13%	13%
HW-SC retained	45%	26%	50%	27%	18%	16%
HW-SC YETA/employed	100%	100%	100%	100%	100%	100%
Districts	9%	9%	13%	13%	20%	20%
On-time high school graduation rate						
HW-SC overall	67%	65%	58%	52%	65%	92%
HW-SC retained	84%	86%	81%	84%	82%	95%
HW-SC YETA/employed	93%	94%	94%	94%	100%	100%
Districts	57%	50%	49%	41%	69%	67%
Postsecondary enrollment rate						
HW-SC overall	73%	67%	61%	67%	—	—
HW-SC retained	73%	67%	61%	67%	—	—
HW-SC YETA/employed	83%	90%	68%	—	—	—
Districts	57%	57%	60%	60%	69%	69%

NOTE: '—' denotes sample size was too small (n<10) to report reliable statistics.

Benefits associated with HW-SC program by group. Table 3 reports estimates of the benefits associated with higher high school employment rates and greater educational attainment. The expected increase in high school earnings for each gender by racial/ethnic group was calculated in the same way as described above for HW-SC participants as a whole. The estimates for lifetime earnings, tax revenues, and other social benefits were provided by the same sources noted above (i.e., Belfield & Levin, 2007; U.S. Department of Commerce, 2011) and were calculated in the same way.

As shown in Table 3, the expected benefits associated with high school employment and educational attainment vary by gender and by racial/ethnic group. This is due to the fact that workforce participation and earnings, as well as the use of social services, differ by gender and among racial/ethnic groups (Belfield & Levin, 2007).

Table 3.

Benefits by Gender by Racial/Ethnic and HW-SC Groups

	African American Females	African American Males	Hispanic Females	Hispanic Males	White Females	White Males
Increase in earnings during high school						
HW-SC overall	$2,460	$943	$1,634	$541	($289)	($257)
HW-SC retained	$3,523	$1,639	$3,531	$1,448	$54	($138)
HW-SC YETA/employed	$8,691	$9,007	$8,229	$8,087	$5,361	$2,910
Increase in lifetime earnings ($2014)						
High school graduate v. dropout	$283,010	$348,579	$196,332	$173,072	$298,400	$356,488
Some college v. high school graduate	$242,350	$270,105	$257,645	$361,895	$197,266	$308,471
Increase in tax revenues ($2014)	$118,180	$197,510	$106,525	$149,135	$136,728	$254,031
Other social benefits ($2014)	$100,635	$138,984	$72,562	$96,875	$66,296	$74,317

NOTE: Numbers in parentheses indicate that the average value of the benefits for the HW-SC participant was lower than the average value for the districts.

Costs associated with HW-SC program by group. For the HW-SC program itself, costs vary on account of differences in the average amount of time spent in the program by gender by racial/ethnic group across HW-SC groups (i.e., overall, retained, and YETA/employed). Costs for additional educational attainment also vary slightly due to differences in educational costs by school district (or by county for postsecondary enrollment) and the relative mix of HW-SC participants by district in each group. As with HW-SC participants overall, we calculated a weighted cost for each group based on the proportions of HW-SC participants from each of the HW-SC programs. The differences in cost for the average HW-SC participant for each group are shown in Table 4.

Table 4.

Costs by Gender by Racial/Ethnic and HW-SC Groups

	African American Females	African American Males	Hispanic Females	Hispanic Males	White Females	White Males
Costs associated with Hillside program						
HW-SC overall	$11,392	$11,221	$11,049	$11,242	$10,131	$11,735
HW-SC retained	$12,473	$12,103	$11,913	$12,008	$11,023	$12,809
HW-SC YETA/employed	$12,457	$12,425	$11,834	$11,937	$12,112	$10,905
Additional years of high school ($2014)						
HW-SC overall	$39,711	$39,597	$40,319	$40,406	$39,185	$38,642
HW-SC retained	$39,676	$39,579	$40,439	$40,365	$39,241	$38,415
HW-SC YETA/employed	$39,604	$39,572	$40,548	$39,930	$40,197	$38,608
Postsecondary education ($2014)						
Private costs (tuition and fees)	$9,476	$9,476	$9,476	$9,476	—	—
Social costs (local and state contributions)						
HW-SC overall	$17,171	$17,130	$17,405	$17,449	—	—
HW-SC retained	$17,171	$17,130	$17,405	$17,449	—	—
HW-SC YETA/employed	$17,117	$17,198	$17,459	—	—	—

NOTE: '—' denotes sample size was too small (n<10) to report reliable statistics.

Benefit-cost ratios by group. For the gender by racial/ethnic groups with complete outcome, benefit, and cost information, we calculated total, private, and social benefit-cost ratios in the same way that we did for HW-SC participants overall. These calculations are shown in Table 5. In all cases, the benefit-cost ratios exceed 1.00, which means the expected value of the benefits for each group of participants in the HW-SC program is greater than the expected costs. However, the social return for Hispanic females in the HW-SC overall group is marginal with a benefit-cost ratio of 1.02. As with the HW-SC participants overall, for each gender by racial/ethnic group the HW-SC participants themselves are expected to enjoy the greatest returns from the HW-SC program.

Table 5.

Benefit-Cost Ratios by Gender by Racial/Ethnic and HW-SC Group

	Benefit-Cost Ratios		
	Total	Private	Social
African American Females			
HW-SC overall	4.60	43.98	1.20
HW-SC retained	6.70	53.84	2.10
HW-SC YETA/employed	7.69	51.40	2.29
African American Males			
HW-SC overall	6.79	64.87	2.55
HW-SC retained	9.55	73.85	3.86
HW-SC YETA/employed	10.29	58.82	3.75
Hispanic Females			
HW-SC overall	3.05	58.36	1.02
HW-SC retained	5.73	60.86	2.02
HW-SC YETA/employed	6.73	56.32	2.23
Hispanic Males			
HW-SC overall	4.52	57.69	1.55
HW-SC retained	7.79	62.99	3.03
HW-SC YETA/employed	—	—	—
White Females			
HW-SC overall	—	—	—
HW-SC retained	—	—	—
HW-SC YETA/employed	—	—	—
White Males			
HW-SC overall	—	—	—
HW-SC retained	—	—	—
HW-SC YETA/employed	—	—	—

NOTE: '—' denotes sample size was too small (n<10) to report reliable statistics for the postsecondary enrollment outcomes. As a result, a benefit-cost ratio could not be reported.

SENSITIVITY ANALYSIS

Definition and Types

The previous results rely on the best assumptions that can be made based on existing research evidence and data availability. Hence, the estimates represent the expected value, i.e., the most probable value, of the benefit-cost ratios of the HW-SC program. However, due to uncertainty, there will likely be some difference between the costs and benefits and, hence, expected values that are eventually realized (Levin & McEwan, 2001). Uncertainty is inherent to any CB analysis due mainly to limitations associated with the underlying research evidence or data, and unforeseen changing conditions in the economic panorama (Levin & McEwan, 2001). Sensitivity analysis is a technique that is used to take uncertainty into account. This technique assesses how degrees of uncertainty affect CB estimates, and focuses on revealing the extent to which different assumptions would change the CB analysis results (Levin & McEwan, 2001).

There are different ways of conducting a sensitivity analysis (Levin & McEwan, 2001). The simplest form is to vary only one parameter (i.e., estimate) in the model (for instance, the percentage of HW-SC high school graduates) by a given percentage, and then examine the effect that change has on the benefit-cost ratio. This process can be repeated, changing different parameters in the model, always one at a time, leaving all of the others constant. This approach is known as one-way

sensitivity analysis and is useful to test which parameters have the greatest influence on the CB analysis results (Levin & McEwan, 2001).

Multiway sensitivity is another form of sensitivity analysis (Levin & McEwan, 2001). This approach involves varying more than one parameter in the model at the same time, then assessing how the CB analysis results respond to the changes (Levin & McEwan, 2001). One specific method within the multiway approach is called extreme sensitivity analysis. This technique specifies two scenarios, one optimistic and one pessimistic, and varies all of the parameters in the model based on "best" and "worst" case scenarios (Levin & McEwan, 2001).

Sensitivity Analysis Applied to HW-SC CB Analysis

Assumptions. In the HW-SC CB analysis there are a number of important assumptions that, if not met, would produce discrepancies between the expected and the actual values of the costs and benefits. These assumptions were made because of limitations associated with the Hillside data or existing research evidence. The most important are described below.

First, local data were not always available, so state- or even national-level data were used instead. This approach presumes that there is little variation among localities, which may not be an accurate assumption.

Second, based on Belfield and Levin's (2007) research, it was assumed that HW-SC participants who graduated from high school attended two additional years of high school, on average, compared to high school dropouts in the districts. In addition, also following Belfield and Levin (2007), an assumption of an average of two years of postsecondary education was used for HW-SC participants who enrolled in college. Although these are reasonable, research-based assumptions, there is uncertainty with regard to their accuracy for the HW-SC program and districts.

Third, literature on school-to-work programs suggests that selection bias is likely to be present in the selection process of participants into such programs (Stern, Finkelstein, Stone, Latting, & Dornsrife, 1995). Selection bias refers to the fact that individuals who participate are not randomly selected from the population. Specifically in school-to-work programs, selection bias is likely to be present because participation is voluntary, and students who decide to participate may be more motivated or possess stronger skills than those who decide not to participate (Stern et al., 1995). Therefore, participants may have unobserved traits that lead to more favorable outcomes in the future, but not due to the program itself (Stern et al., 1995). Thus, positive program effects on participants may be overestimated because of selection bias, causing an overestimation of benefits in the CB analysis (Stern et al., 1995). With selection bias, the choice of an appropriate control or comparison group for participants becomes a complex task (Stern et al., 1995).

All of these sources of uncertainty could impact our CB analysis results for the HW-SC program (i.e., the benefit-cost ratios). To take this uncertainty into account, two types of sensitivity analysis were conducted: one-way sensitivity and extreme sensitivity analysis. Both types of analysis are based on changing the above assumptions, and assessing the impact of these changes on the benefit-cost ratios.

One-way sensitivity analysis. For this analysis, each of the following parameters in the model were both increased and decreased by 25% from their original values for HW-SC participants overall: on-time high school graduation rate, postsecondary enrollment rate, high school employment rate, HW-SC per participant cost, cost of two additional years of high school, and cost of two years of postsecondary education. For each parameter changed, we calculated new benefit-cost ratios. Then, we calculated the percentage change between the new benefit-cost ratio and the original benefit-cost ratio. For instance, the on-time high school graduation rate for HW-SC participants was decreased by 25% leaving all of the other parameters in the model at their original values. Then, a new benefit-cost ratio was calculated and found to be -3.11 (see Table 6). Compared to the original benefit-cost ratio of 4.75, the 25% decrease in the on-time high school graduation rate resulted in a 165.4% reduction in the benefit-cost ratio estimate. In contrast, a 25% increase in the on-time high school graduation rate for HW-SC participants, leaving all of the other parameters in the model at their original values, resulted in an increase of 54.7% in the benefit-cost ratio (from 4.75 to 7.35). This procedure was

repeated for each of the parameters in the model. The results of these one-way sensitivity analyses are summarized in Table 6 and displayed in Figure 10.

The results demonstrate that the benefit-cost ratios for the HW-SC program are highly sensitive to estimates regarding the on-time high school graduation rate of HW-SC participants. As stated above, a 25% decrease in the HW-SC on-time graduation rate produced a benefit-cost ratio reduction of 165.4%, whereas a 25% increase in the on-time graduation rate had a positive impact of 54.7% on the benefit-cost ratio. The results also show that the benefit-cost ratios are moderately sensitive to variations in HW-SC participants' postsecondary enrollment rates and the HW-SC program's per participant cost. Specifically, a 25% decrease (25% increase) in the HW-SC postsecondary enrollment rate produced a 16.9% reduction (12.4% rise) in the benefit-cost ratio. Similarly, a 25% decrease (25% increase) in the HW-SC program's per participant cost resulted in a 17.8% increase (13.2% decrease) in the benefit-cost ratio. Lastly, variations in high school employment rates and the costs of additional years of high school or college had relatively small impacts on the benefit-cost ratios. These results suggest that, from all of these parameters in the model, the on-time high school graduation rate has the greatest influence on the benefit-cost ratio. Therefore, concentrating efforts on maximizing this outcome for HW-SC participants would seem to be a good strategy for improving the return on investment associated with the program.

Table 6.

One-Way Sensitivity Analysis. Benefit-Cost Ratios and Percentage Change in Benefit-Cost Ratio After a 25% Change in Each of the Main Parameters in the Model

	Benefit-Cost Ratio			% Change in Benefit-Cost Ratio	
Parameters	Initial	25% decrease	25% increase	25% decrease	25% increase
On-time high school graduation	4.75	-3.11	7.35	-165.4%	54.7%
Postsecondary enrollment	4.75	3.95	5.34	-16.9%	12.4%
High school employment	4.75	4.74	4.76	-0.2%	0.2%
HW-SC per participant cost	4.75	5.60	4.13	17.8%	-13.2%
Cost of two additional years of high school	4.75	5.05	4.49	6.2%	-5.5%
Cost of two additional years of postsecondary education	4.75	4.95	4.57	4.2%	-3.9%

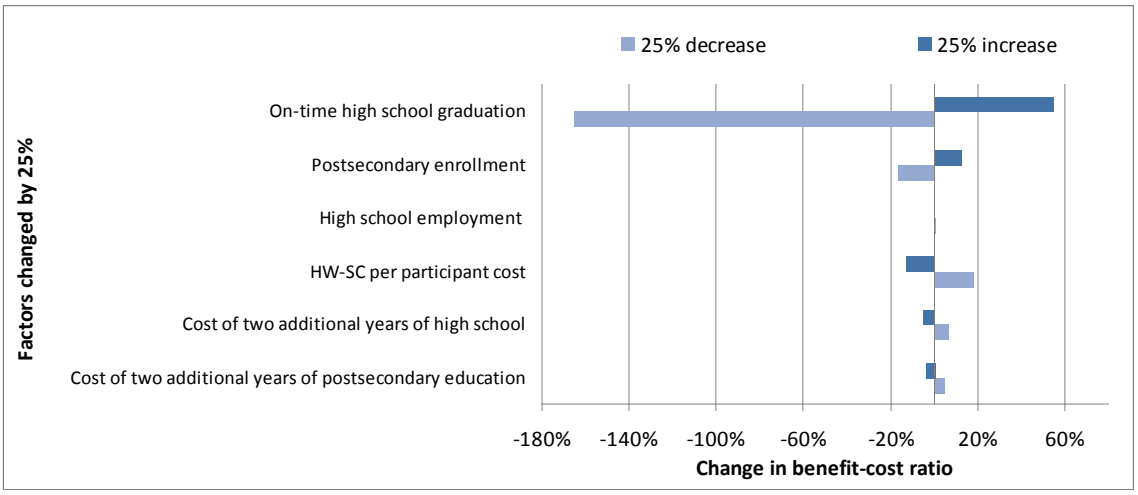

Figure 10. One-way sensitivity analysis. Percentage change in benefit-cost ratio after a 25% change in each of the main parameters in the model.

Extreme sensitivity analysis. This type of sensitivity analysis requires assuming the worst possible cases for multiple parameters in the model to calculate the HW-SC benefit-cost ratio (pessimistic scenario); then repeating the process, but assuming the best cases for the parameters (optimistic scenario).

For the pessimistic scenario, the following four assumptions were made: first, due to selection bias, the on-time high school graduation rate for HW-SC participants may be overestimated. Therefore, an assumption of a 25% decrease in the on-time graduation rate for HW-SC participants was made. Because we do not have sufficient data to determine the actual extent of selection bias in the HW-SC program, a relatively large change of 25% from the original rate was assumed.

Second, in the original analysis presented earlier, the "non-consenters," i.e., the HW-SC high school graduates whose parents did not agree to share information about their graduate's postsecondary enrollment status, were assumed to have the same postsecondary enrollment rate as the HW-SC "consenters." Under the pessimistic scenario, our new assumption is that the postsecondary enrollment rate of the HW-SC non-consenters was the same as the postsecondary enrollment rates of district students. This resulted in a 4.5% decrease in the HW-SC postsecondary enrollment rate.

Third, in the previous analysis, national employment rates weighted by race/ethnicity were used to estimate the high school employment rate of district students (combined district rate of 11.43%). Under the pessimistic scenario, the district high school employment rate was recalculated to be a weighted average of the employment rates of 16-19 year olds in Erie, Monroe and Onondaga counties (Center for Labor Market Studies, 2007). The resulting combined local high school employment rate of 36.3% is more than three times higher than the national figure, which we suspect may be due to the inclusion of employed individuals who were no longer enrolled in high school.

Fourth, in the previous analysis, the federal minimum wage ($7.25/hour) was used as an estimate of the wage rate of district students who were employed during high school. Under the pessimistic scenario, we changed the district students' average wage to be the same as the HW-SC participants' average wage ($7.38/hour).

In order to estimate the optimistic scenario, we made different assumptions about the costs associated with HW-SC participation. In the original analysis, we assumed that HW-SC participants who graduated from high school attended two additional years of high school, on average, compared to high school dropouts, and that HW-SC participants who enrolled in postsecondary education attended two years of postsecondary education, on average. For the optimistic scenario, we changed these assumptions to one additional year of high school and one year of postsecondary

education, instead of two. This results in a 49% decrease in the costs of additional education.

The results of the extreme sensitivity analysis for both the optimistic and pessimistic scenarios are displayed in Figure 11. For the HW-SC overall group, the benefit-cost ratios vary from -3.66 in the pessimistic scenario to 5.90 in the optimistic case. Therefore, based on pessimistic estimates, we find that the return on investment of the HW-SC program could be negative for the overall group. For the retained group, the benefit-cost ratios vary from 4.20 (pessimistic) to 10.73 (optimistic); these results indicate that even in the pessimistic scenario, the return of the HW-SC program would be positive. Lastly, the benefit-cost ratios vary from 6.06 to 12.99 for the YETA/employed group, which suggests that the returns of the HW-SC program would be positive for this group even under pessimistic conditions. In sum, HW-SC program returns are expected to be positive even in the pessimistic scenario for the retained and YETA/employed groups, but the program could produce negative returns (i.e., costs that exceed benefits) for the HW-SC overall group if the pessimistic conditions are realized. This suggests that efforts to improve the proportions of HW-SC participants that are retained or YETA/employed while maintaining, if not improving, the high school and postsecondary outcomes for these groups would result in positive total returns on the investments made in the HW-SC program.

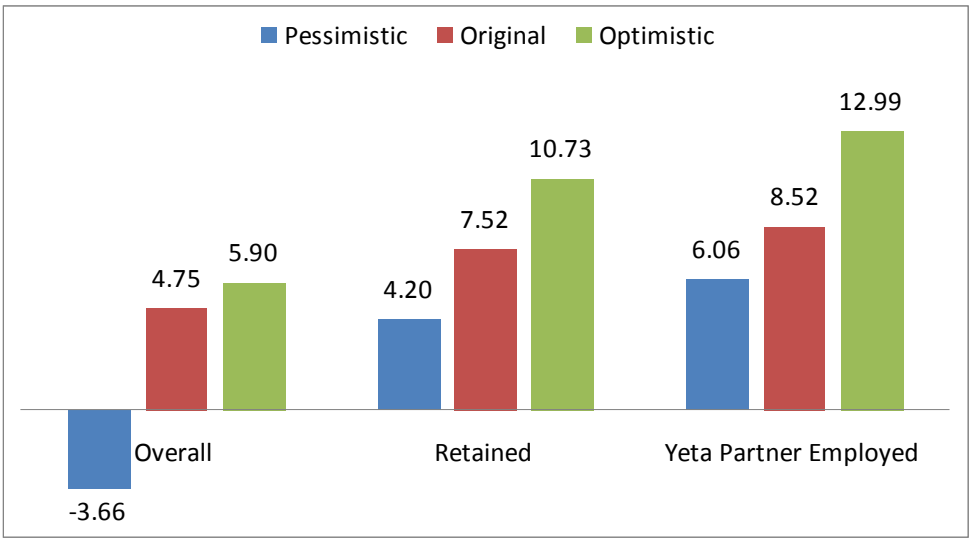

Figure 11. Extreme sensitivity analysis. Benefit-cost ratios for pessimistic and optimistic scenarios by HW-SC group.

NON-FINANCIAL BENEFITS OF EDUCATIONAL ATTAINMENT

In our CB analysis we calculated the quantifiable private and social benefits of education for both completing high school and some higher education. Research shows (Baum, Ma, & Payea, 2013; National Center for Health Statistics, 2015), however, that there are a number of non-financial benefits of education, many with intergenerational effects, which also have positive impacts on individuals and society at large. In this section we report on the benefits of education as they relate to:

- social mobility;
- poverty status;

- measures of health, specifically:
    - rates or prevalence of:
        - heart disease, cancer and stroke;
        - breastfeeding among mothers;
        - severe headaches/migraines, neck pain and low back pain;
        - delayed non receipt of needed medical care, prescription drugs or dental care;
        - mammography;
        - pap smears;
        - colorectal screenings;
        - smoking;
        - exercise; and
        - obesity
- the amount of time mothers spend per day on:
    - children; and
    - children's activities
- areas of civic involvement, including:
    - understanding political issues,
    - volunteerism; and
    - rates of voting;
- pregnancy by age; and
- being a single mother.

Social Mobility

Higher levels of education, regardless of parents' income quintile, are associated with greater social mobility (Baum et al., 2013). Between 2000-2008, of adults who grew up in the third (middle) family income quintile, 31% of those with a four-year college degree moved up to the top income quintile, compared to 12% of individuals without a four-year degree. For individuals who grew up in the bottom family income quintile, 47% of those without a college degree remained in the bottom income quintile, compared to 10% of adults who obtained a bachelor's degree (see Figures 12 & 13).

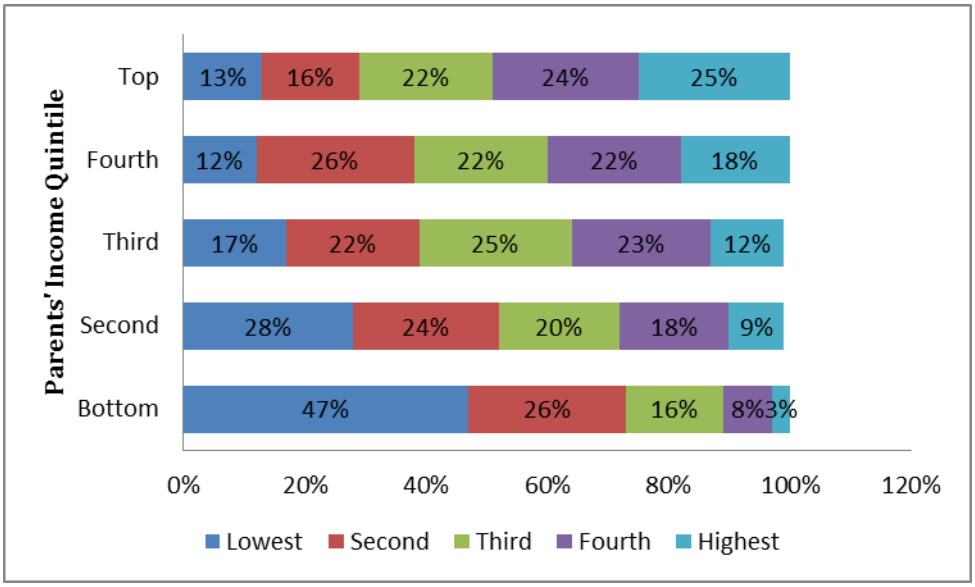

Figure 12. Social Mobility: Family income quintiles of adult children, by education and parents' family income quintile, 2000-2008, non-college graduate adult children. Source: Baum et al., 2013, p. 22.

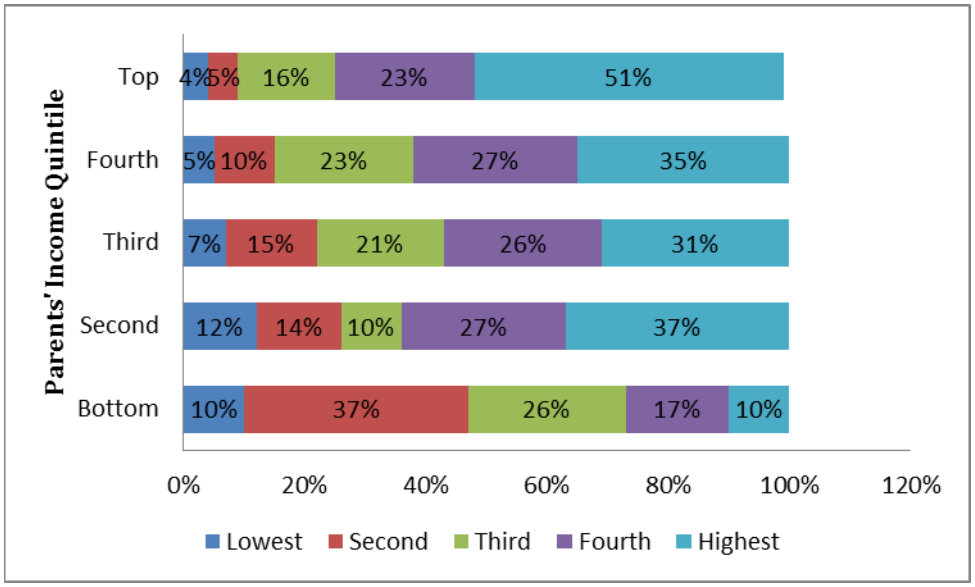

Figure 13. Social Mobility: Family income quintiles of adult children, by education and parents' family income quintile, 2000-2008, college graduate adult children. Source: Baum et al., 2013, p. 22.

Poverty

Data indicate that poverty rates are negatively correlated with education level (Baum et al., 2013). The 2011 poverty rate for individuals with less than a high school diploma was 28%, compared to 14% for individuals who had a high school diploma and 11% for individuals who had some college, but no degree. Moreover, individuals living in households headed by unmarried females with children under 18 were particularly vulnerable to living in poverty. The poverty rate for individuals with less than a high school diploma, living in this type of family structure, was 58%, compared to 40% for those with a high school diploma and 33% for those with some college, but no degree (see Figure 14). In addition, the percentage of children,

under the age of 18, who lived with both parents was positively associated with parental educational attainment. (see Figure 15).

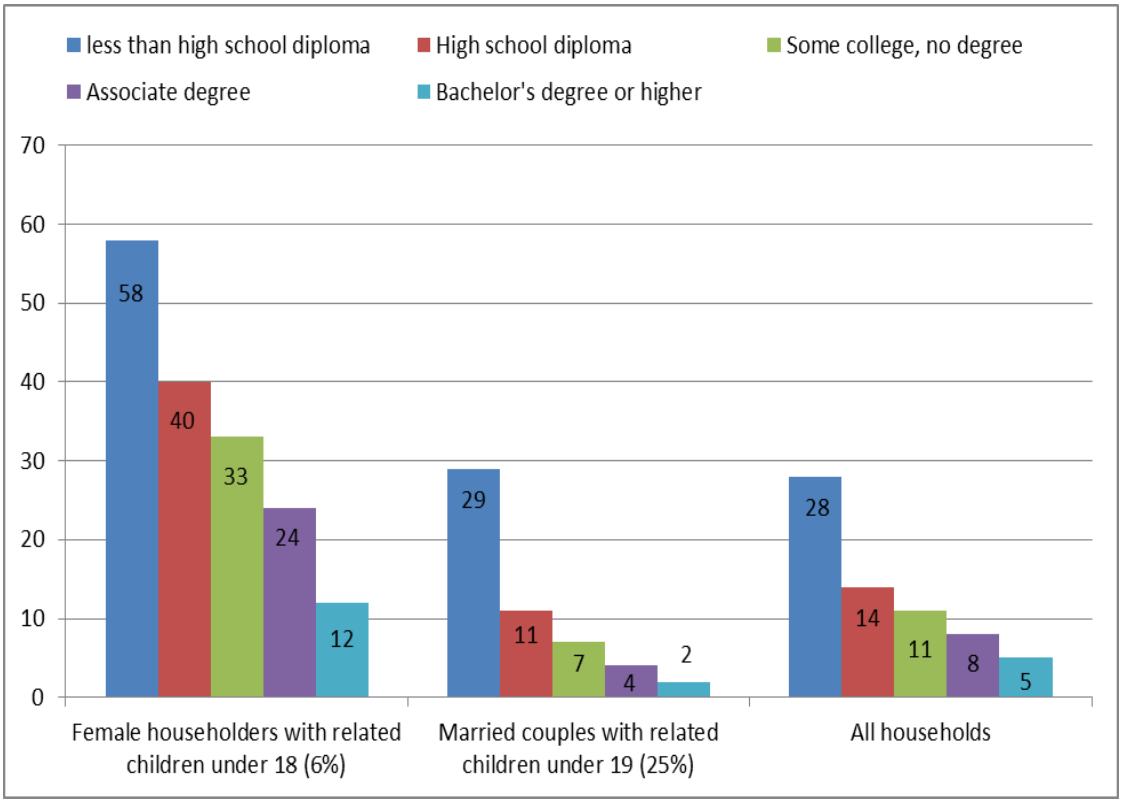

Figure 14. Percentage of individuals ages 25 and older living in households in poverty by household type and education level, 2011. Source: Baum et al., 2013, p. 25.

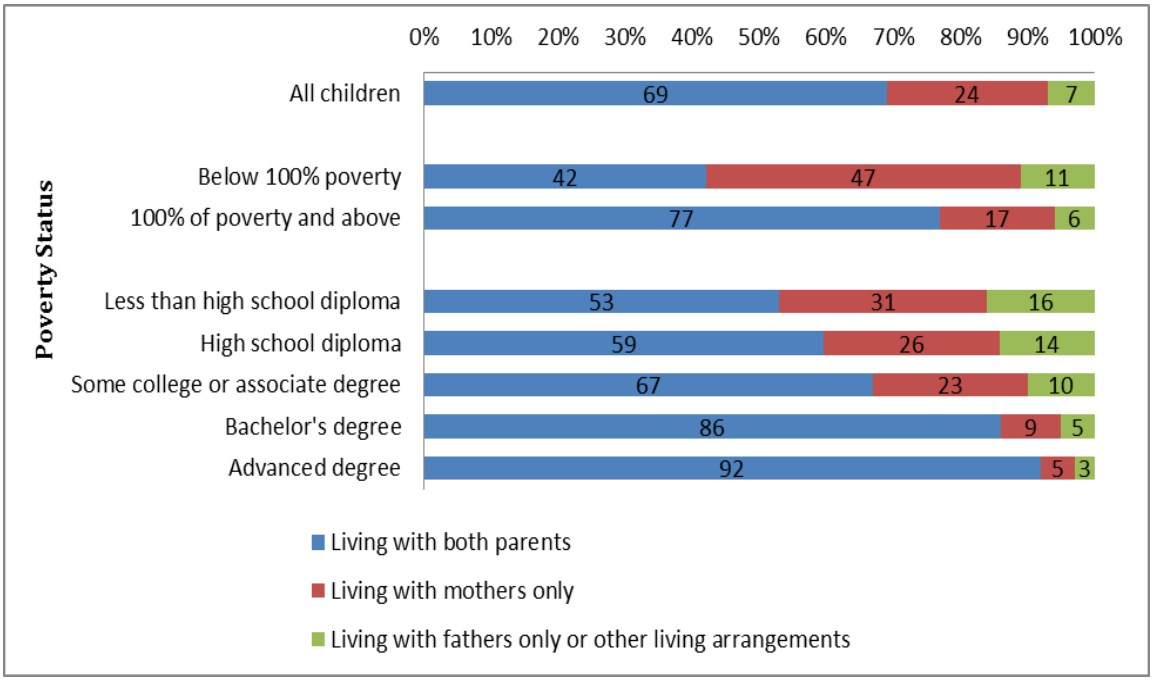

Figure 15. Living arrangements of children under 18 years of age, by poverty status and highest education of either parent, 2011. Source: Baum et al., 2013, p. 25.

Measures of Health

Research indicates that higher levels of educational attainment are generally associated with better overall health, including the frequency of suffering from various types of chronic pain, experiencing high risk diseases, participating in exercise and seeking out recommended screenings.

Prevalence of heart disease, cancer, and stroke. 2013 data from the Centers for Disease Control and Prevention (CDC) (National Center for Health Statistics, 2015) indicated higher percentages of reported heart disease and stroke for those with lower educational attainment. Specifically, 14% of individuals who had no high school diploma reported having heart disease, compared to 12% with a

high school diploma or GED and 11% with some college or more. Five percent of survey respondents who had no high school diploma reported having had a stroke, compared to 3% with a high school diploma or GED and 2% with some college or more. In contrast, reports of cancer were slightly higher for respondents with higher levels of education (see Table 7).

Table 7.

Percentage of Respondent-Reported Prevalence of Heart Disease, Cancer, and Stroke Among Adults Aged 18 and Over, by Education, 2013

	Heart disease	Cancer	Stroke
No high school diploma or GED	13.7	5.3	4.5
High school diploma or GED	12.1	7.0	3.1
Some college or more	11.3	7.0	2.4

Note: Retrieved from National Center for Health Statistics, 2015.

Reported breastfeeding among mothers. 2013 data from the CDC (National Center for Health Statistics, 2015) indicated that mothers with greater educational attainment reported higher rates of breastfeeding their babies. Research suggests that breastfeeding provides health benefits to both mothers and children, including lower rates of ovarian cancer among women and important antibodies that protect babies (Moore, 2001). In addition, breastfeeding has economic benefits (Weimer, 2001). The CDC (National Center for Health Statistics, 2015) reported that 59% of women with no high school diploma or GED reported breastfeeding their babies, compared to 73% with some college; moreover, 41% of

women with no high school diploma or GED reported breastfeeding their babies for three months or more, compared to 49% of mothers with some college (see Table 8).

Table 8.

Percentage of Breastfed Babies by Mothers Aged 15-44, by Education, 2013

	Percent of babies breastfed	Percent of babies breastfed 3 months or more
No high school diploma or GED	58.7	41.3
High school diploma or GED	55.4	36.8
Some college, no bachelor's degree	72.7	48.7
Bachelor's degree or higher	88.3	65.8

Note: Retrieved from National Center for Health Statistics, 2015.

Pain. 2013 data from the CDC (National Center for Health Statistics, 2015) indicated that level of education was associated with individuals' chronic pain. Specifically, 19% of people with no high school diploma or GED reported having severe headaches or migraines, compared to 15% of individuals with some college or more; 35% people with no high school diploma or GED reported having lower back pain, compared to 28% of individuals with some college or more; and 18% people with no high school diploma or GED reported having neck pain, compared to 15% of individuals with some college or more (see Table 9).

Table 9.

Percentage of Reported Severe Headache or Migraine, Lower Back Pain, and Neck Pain Among Adults Aged 25 and Over in the Last 3 Months, by Education, 2013

	Percent of adults with pain in the last 3 months		
	Severe headache or migraine	Low back pain	Neck pain
No high school diploma or GED	18.7	34.5	17.6
High school diploma or GED	16.5	31.9	16.4
Some college or more	15.0	28.4	15.0

Note: Retrieved from National Center for Health Statistics, 2015.

Non-receipt of necessary medical related care. 2013 data from the CDC (National Center for Health Statistics, 2015) indicated that 18% of people with no high school diploma or GED reported delay or non-receipt of needed medical care due to cost, compared to 15% of individuals with a high school diploma or GED and 11% with some college or more; 14% people with no high school diploma or GED reported non-receipt of needed prescription drugs due to cost, compared to 11% of individuals with a high school diploma or GED and 7% with some college or more; 22% people with no high school diploma or GED reported non-receipt of needed dental care due to cost, compared to 17% of individuals with a high school diploma or GED and 13% with some college or more (see Table 10).

Table 10.

Percentage of Reported Delay or Non-Receipt of Needed Medical Care, Non-Receipt of Needed Prescription Drugs, or Non-Receipt of Needed Dental Care During the Past 12 Months Due to Cost, by Education, 2013

	Delay or non-receipt of needed medical care due to cost	Non-receipt of needed prescription drugs due to cost	Non-receipt of needed dental care due to cost
No high school diploma or GED	18.1	14.4	22.1
High school diploma or GED	14.8	10.9	17.0
Some college or more	11.2	7.4	12.7

Note: Retrieved from National Center for Health Statistics, 2015.

Use of recommended screenings. 2013 data from the CDC (National Center for Health Statistics, 2015) indicated that individuals' educational level was associated with their use of recommended medical screenings. Specifically, 54% of women with no high school diploma or GED aged 40 or over reported having a mammogram in the past 2 years, compared to 62% of women with a high school diploma or GED and 86% with some college or more (see Table 11); 44% of adults aged 50-75 with no high school diploma or GED reported having had some sort of colorectal test or procedure, compared to 54% of individuals with a high school diploma or GED and 63% with some college or more (see Table 12); and 40% of adults aged 50-75 with no high school diploma or GED reported having had a colonoscopy, compared to 50% of individuals with a high school diploma or GED and 60% with some college or more (see Table 13).

Table 11.

Percentage of Reported Use of Mammography Among Women Aged 40 and Over, by Education, 2013

	Percent of women having a mammogram within the past 2 years
No high school diploma or GED	53.6
High school diploma or GED	63.4
Some college or more	71.6

Note: Retrieved from National Center for Health Statistics, 2015.

Table 12.

Percentage of Reported Use of Pap Smears Among Women Aged 25 and Over, by Education, 2013

	Percent of women having a pap smear in the past 3 years
No high school diploma or GED	56.2
High school diploma or GED	62.0
Some college or more	77.1

Note: Retrieved from National Center for Health Statistics, 2015.

Table 13.

Percentage of Reported Use of Colorectal Tests or Procedures Among Adults Aged 50-75, by Education, 2013

	Any colorectal test or procedure	Colonoscopy
No high school diploma or GED	43.5	39.9
High school diploma or GED	53.4	50.4
Bachelor's degree or higher	63.1	59.6

Note: Retrieved from National Center for Health Statistics, 2015.

Smoking. Since 1970, when the risks of smoking became publically widespread, the smoking rate among college graduates has declined. In 2012, among smokers with less than a high school diploma, 14% had not tried to quit in the past 12 months, compared to 11% with some college, but no degree and 9% with an associate degree. Moreover, greater percentages of individuals with a high school diploma (26%) or some college (27%) had quit smoking, compared to those with less than a high school diploma (22%) (see Figure 16).

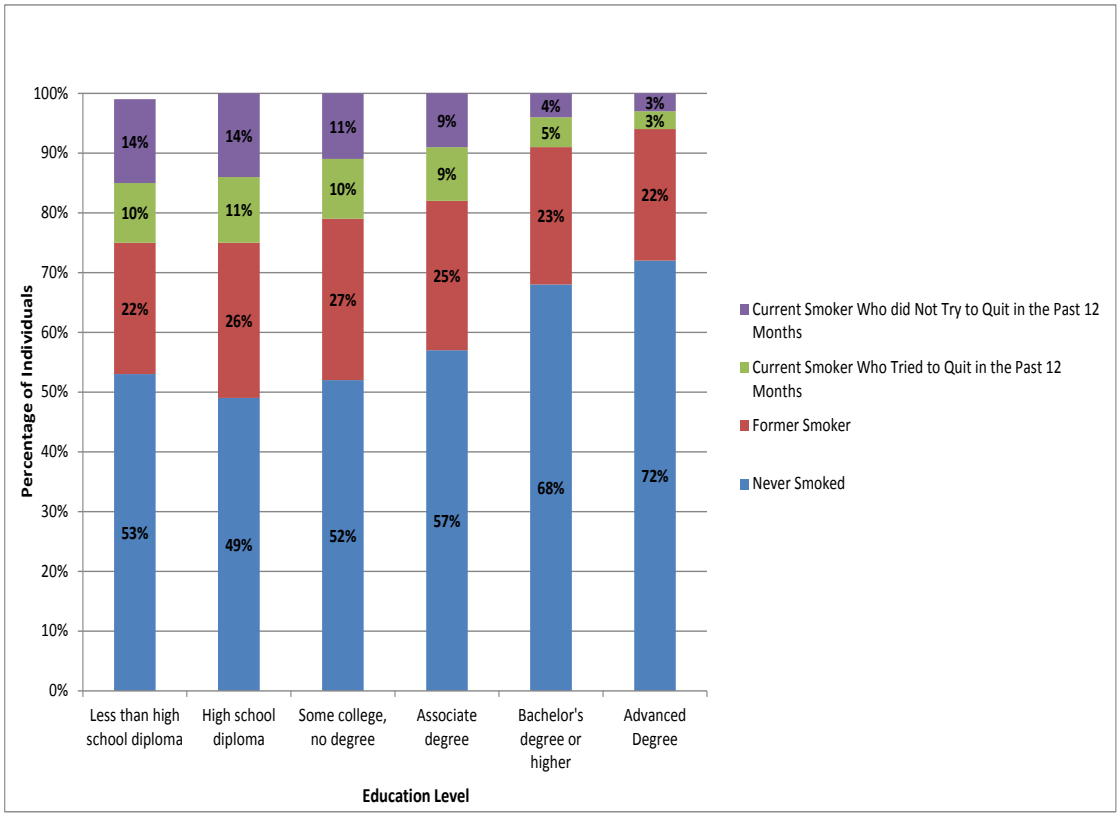

Figure 16. Distribution of smoking histories among individuals age 25 and older, by education level, 2012. Source: Baum et al., 2013, p. 27.

Exercise. 2012 data indicated that individuals with higher levels of education reported higher levels of vigorous exercise (Baum et al., 2013). Among individuals aged 25 to 34 years, 39% of those with less than a high school diploma reported engaging in vigorous exercise, compared to 40% with a high school diploma, 53% with some college, but no degree, and 56% of those with an associate degree. Moreover, in 2011, 29% of individuals with less than a high school diploma reported meeting the federal guidelines for physical activity of at least two and a half hours a week of moderate activity or one and a quarter hours of intense activity,

compared to 38% of those with a high school diploma and 48% with some college or associate degree (see Figure 17).

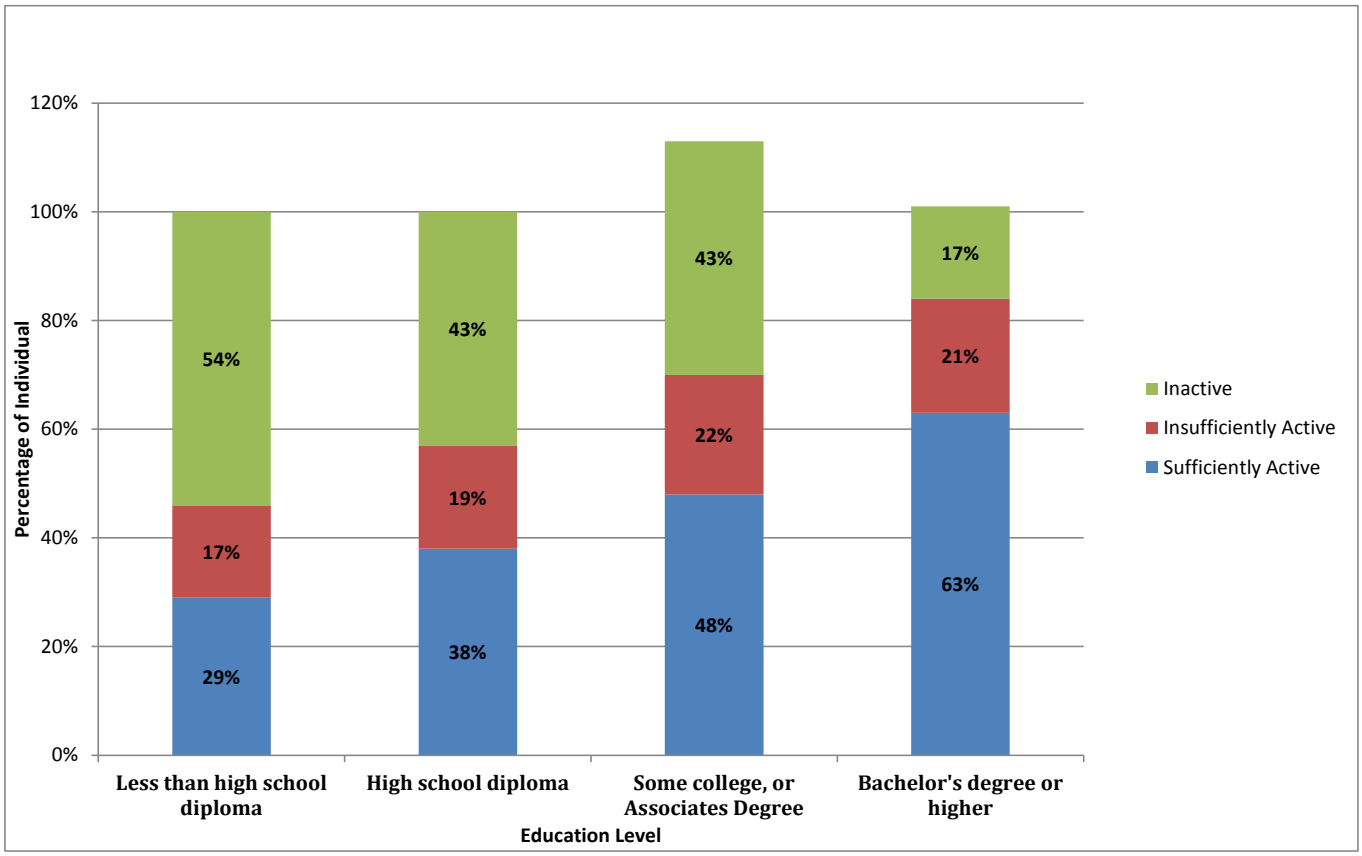

Figure 17. Age-adjusted percentage distribution of leisure-time aerobic activity levels among individuals ages 25 and older, by education level, 2011. Source: Baum et al., 2013, p. 28.

Obesity. Based on data from 2007-2010, obesity rates among children and adolescents ages two to 19 were higher for children living in households with lower education levels. In households in which less than a high school diploma was the highest education level, 24% of boys were obese and 22% of girls, compared to 18% of boys and 14% of girls in households in which some college or an associate degree was the highest education level (see Figure 18).

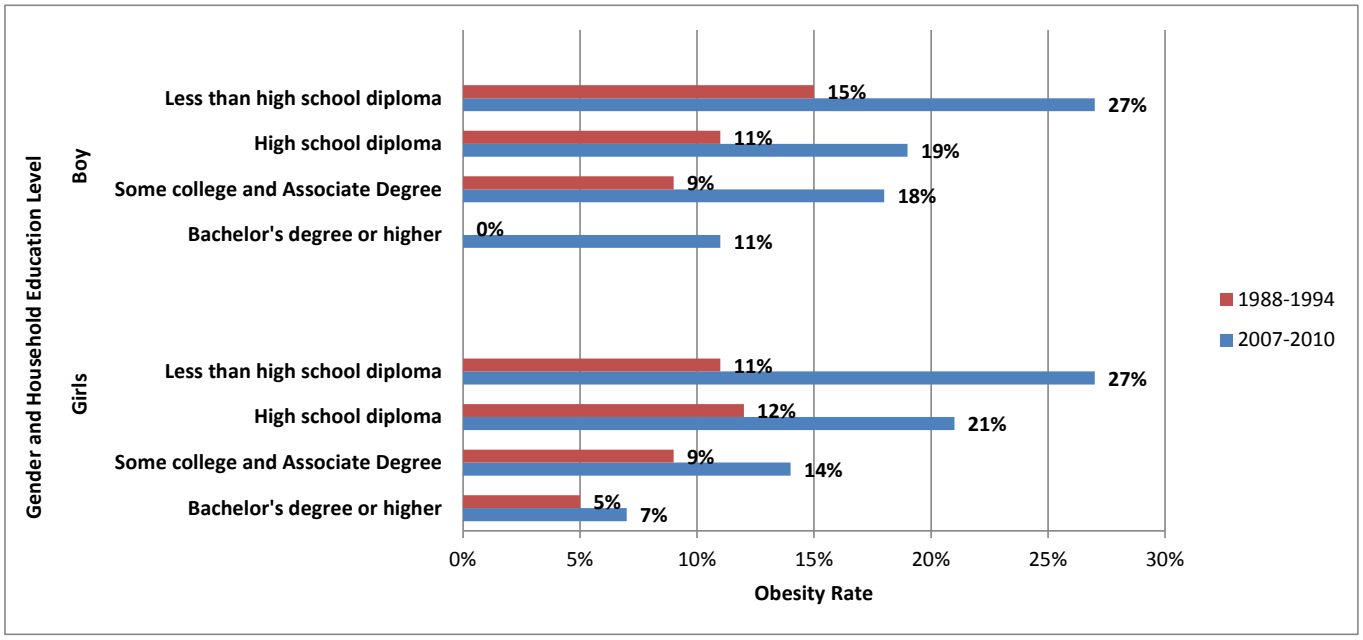

Figure 18. Obesity rate among children and adolescents ages 2 to 19, by gender and highest household education level, 1988-1994 and 2007-2010. Source: Baum et al., 2013, p. 29.

Parents and Children

Data from 2003-2012 indicate that the amount of time mothers spend on their children's activities increases with levels of education, regardless of whether they are employed or unemployed mothers (Baum et al., 2013). Employed mothers with less than a high school diploma reported spending a little over an hour (61 minutes) per day with their children, compared to employed mothers with some college or an associate degree who reported spending 87 minutes per day. Unemployed mothers with less than a high school diploma reported spending a little over two hours (124 minutes) per day with their children, compared to unemployed mothers with some college or an associate degree who reported spending 141 minutes per day (see Figure 19). The research of Kalil, Ryan and Corey (2012) suggests that "highly

educated parents concertedly cultivate children in different ways at different ages and that parenting strategies may reflect broader patterns established much earlier in children's lives—patterns that could have long term implications for children's achievement and attainment" (p. 1380).

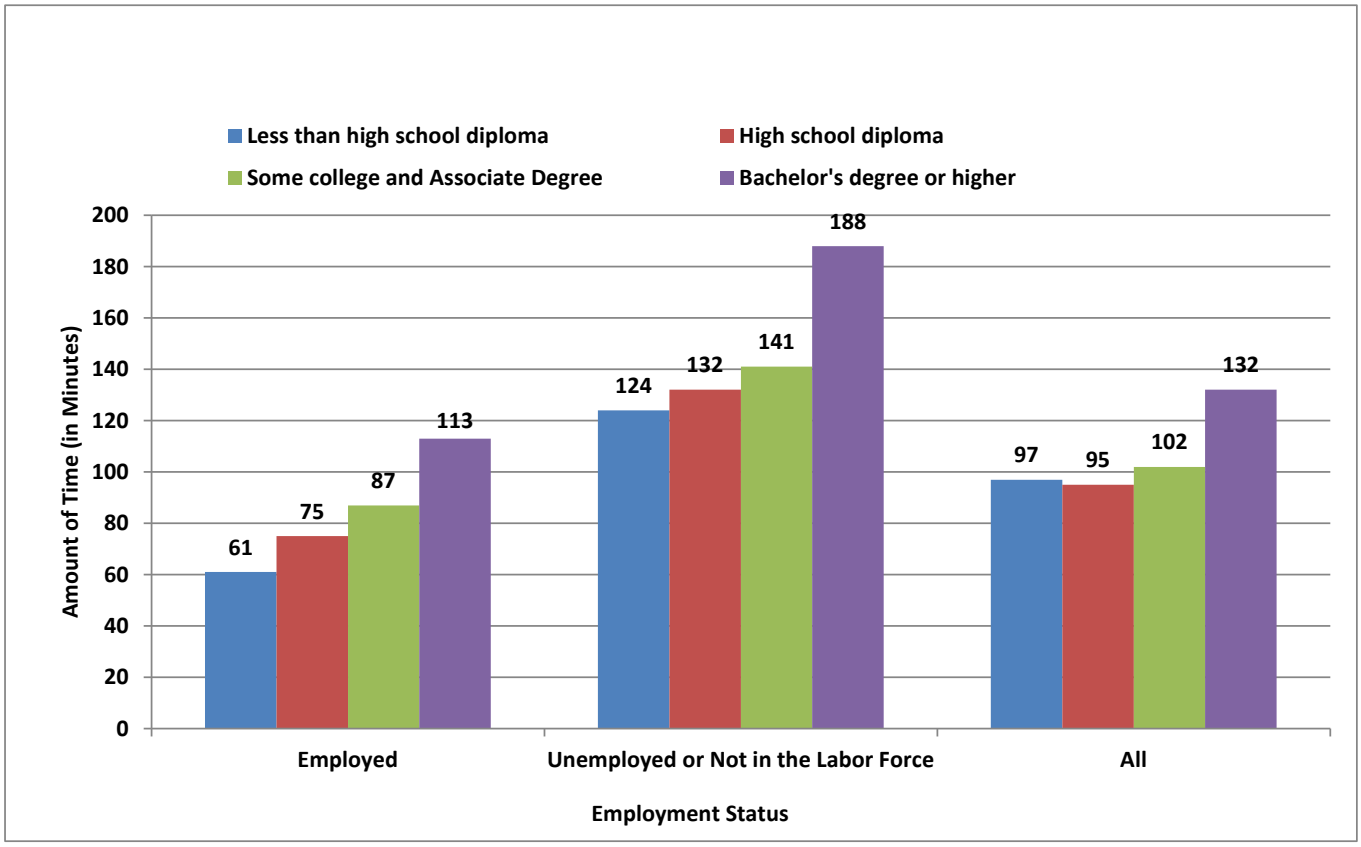

Figure 19. Total amount of time (in minutes) mothers spend per day on children under the Age of 18, by employment status and education level, 2003-2012. Source: Baum et al., 2013, p. 30.

Civic Involvement

2012 data indicate that among adults ages 25 and older, the higher the educational attainment, the greater the understanding of political issues (Baum et al., 2013). For

individuals with less than a high school diploma, 15% indicated that they understood political issues *quite a bit* or *a great deal*, compared to 21% with a high school diploma and 34% with some college or an associate degree (see Figure 20). 2012 data also indicated that the higher the educational attainment, the greater the percentage of individuals 25 and older who volunteered. Among individuals ages 25 and older with less than a high school diploma, 9% volunteered, versus 17% of individuals with a high school diploma and 29% with some college or an associate degree (see Figure 21). Data indicate that regardless of educational attainment, voting rates increase with age, with the greatest increases for those with less education. Nonetheless, 2012 data indicate that individuals with higher levels of educational attainment vote in higher percentages. Twenty percent of individuals ages 18 to 24 with less than a high school diploma voted in the 2012 presidential election, compared to 29% with a high school diploma and 50% with some college or an associate degree (see Figure 22).

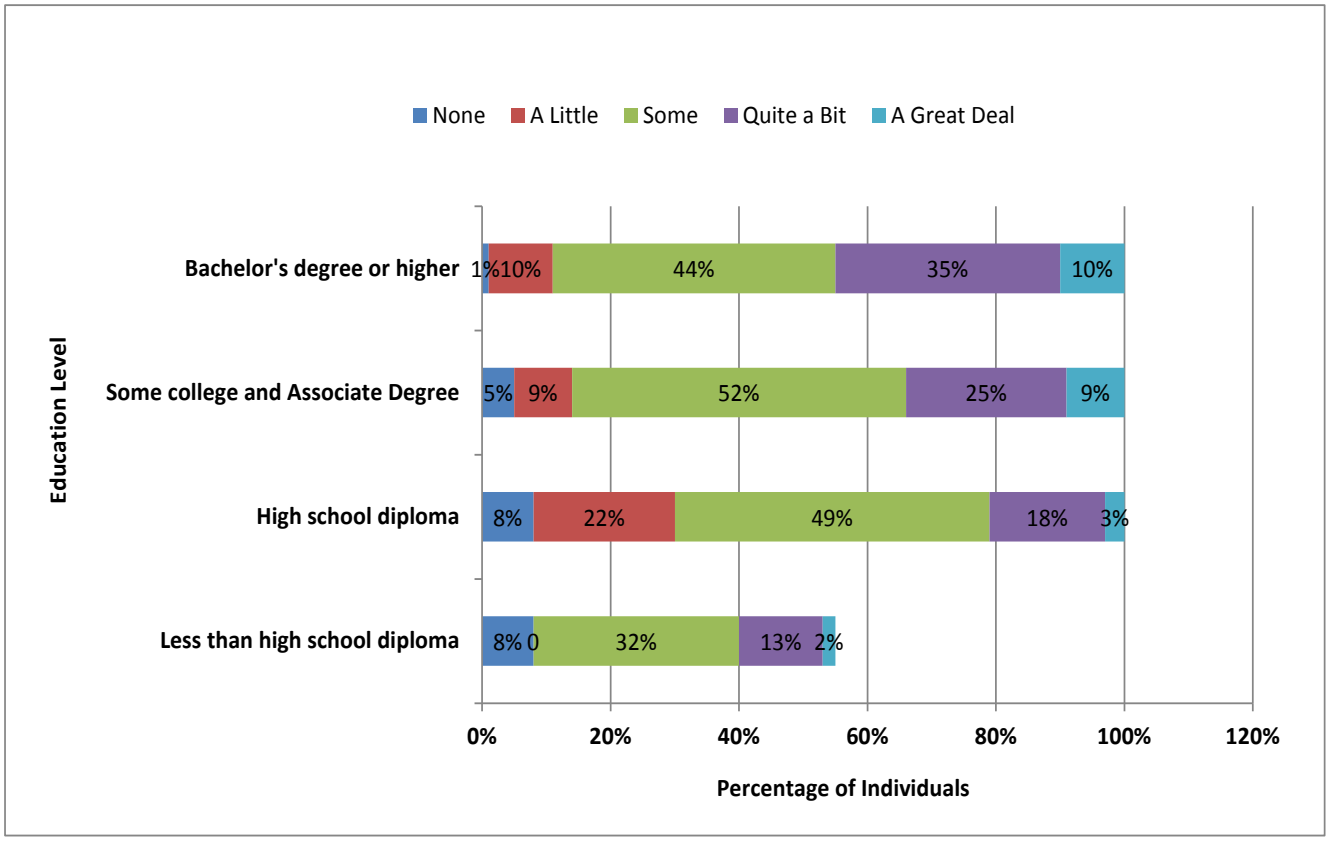

Figure 20. Understanding of political issues among individuals ages 25 and older, 2012. Source: Baum et al., 2013

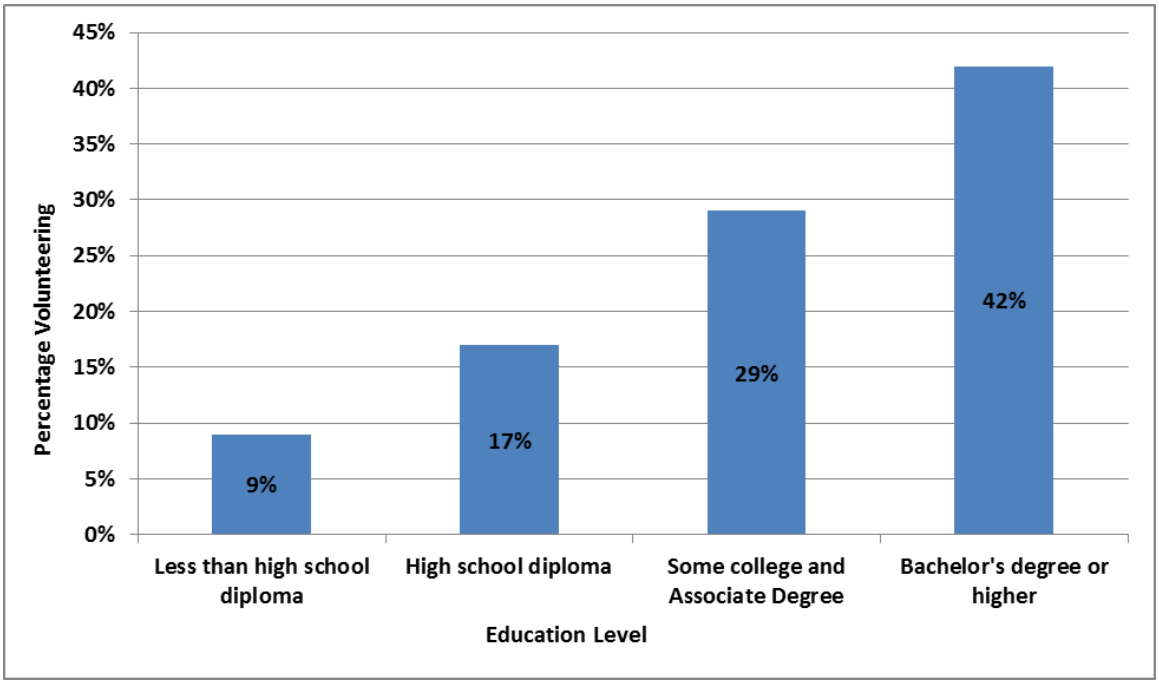

Figure 21. Percentage of individuals ages 25 and older who volunteered, by education level, 2012. Source*:* Baum et al., 2013, p. 31.

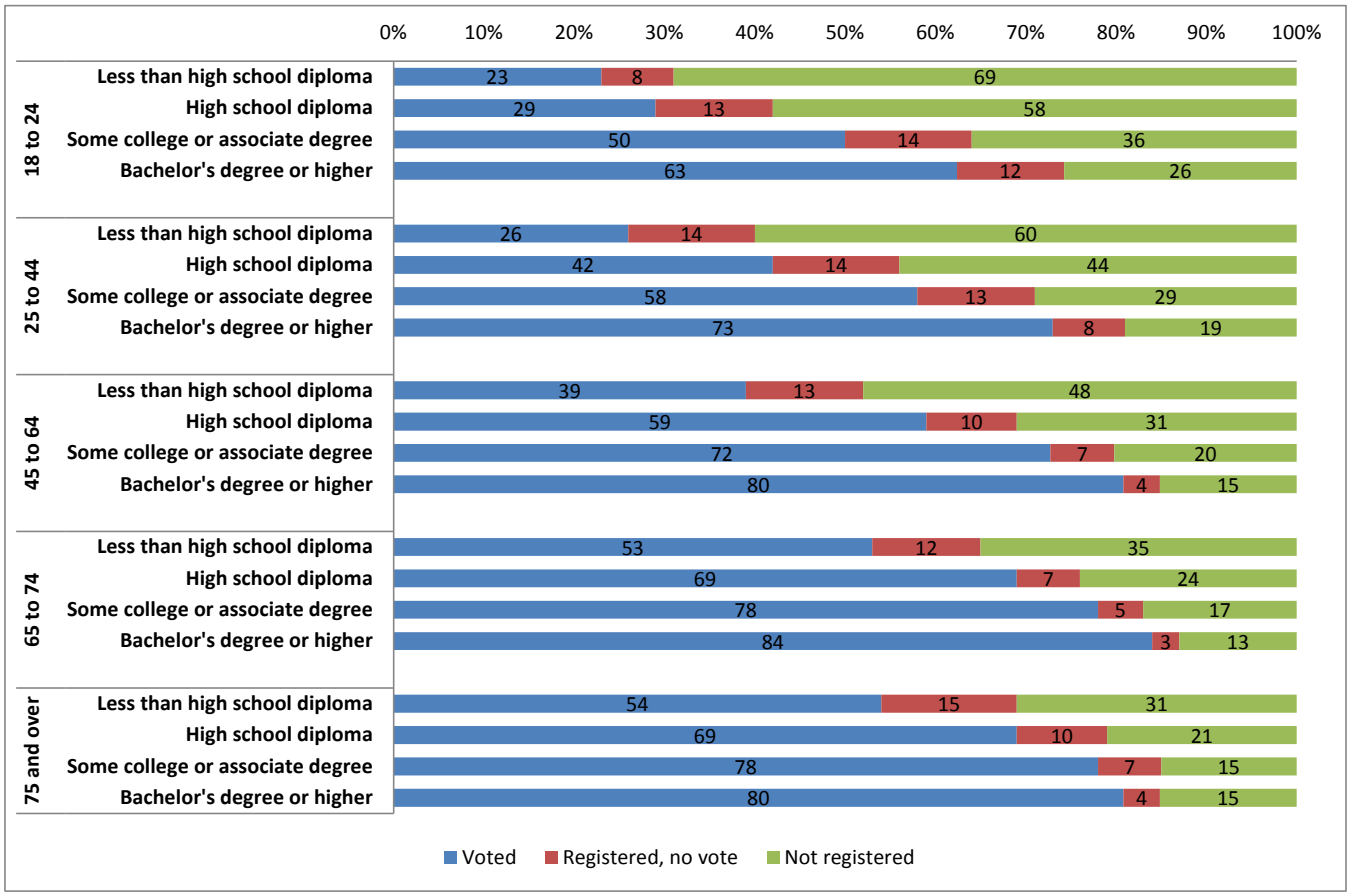

Figure 22. Percentage distribution of voting patterns of U.S. citizens in the 2012 presidential election, by age and educational level. Source: Baum et al., 2013, p. 32.

Pregnancy

Rates of parenting among teen and adult women tend to be negatively correlated with levels of educational attainment (Sum, Khatiwada, McLaughlin, & Palma, 2009). Accordingly, 2006-2007 data indicate that for females ages 16-24 their rates of pregnancy decreased as their educational attainment, in relation to their school enrollment status, increased. Among high school dropouts, 38% of females ages 16-

24 were mothers, compared to 30% of high school graduates and 26% with some college (see Figure 23). In addition, 23% of females ages 16-24 were single mothers, compared to 18% of high school graduates and 14% with some college (see Figure 24).

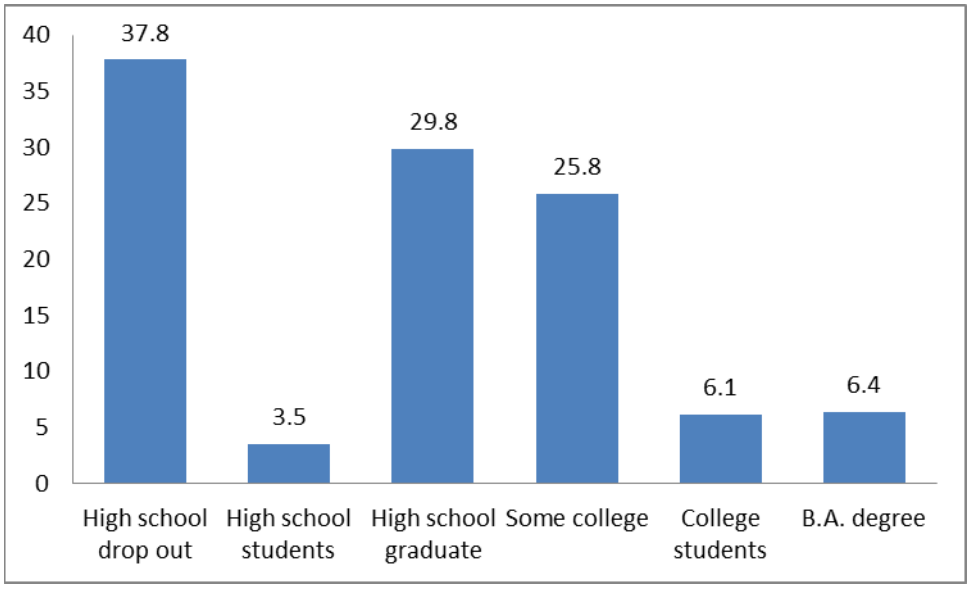

Figure 23. Percent of 16-24 year old women in the U.S. who were mothers by educational attainment/school enrollment status, 2006-2007 averages. Source: Sum et al., 2009.

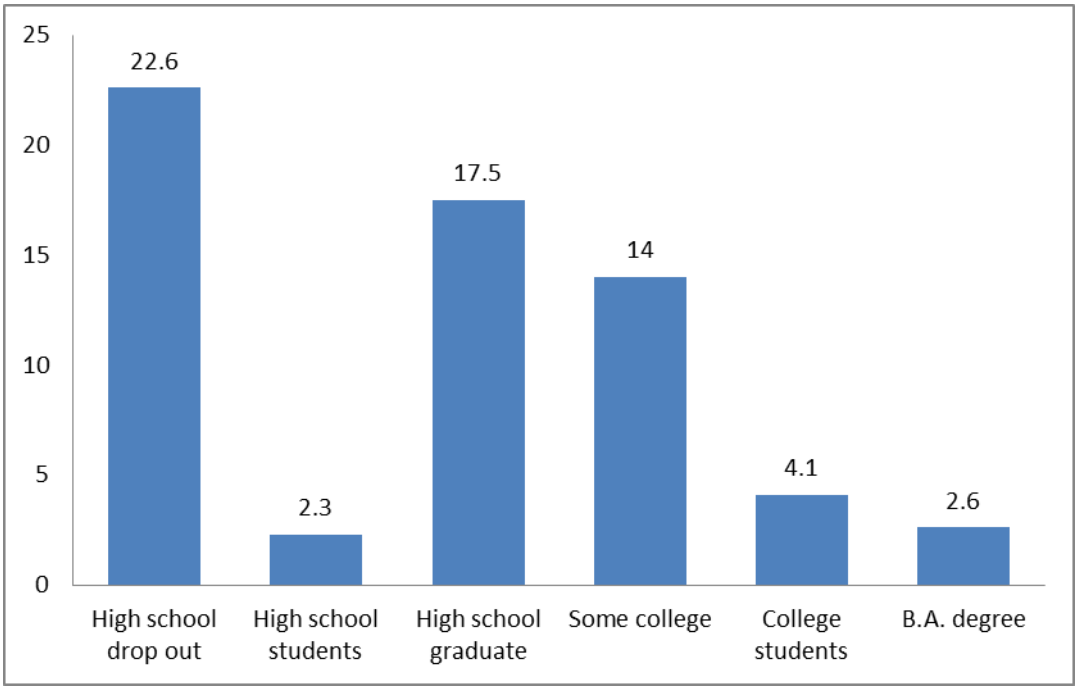

Figure 24. Percent of 16-24 year old women in the U.S. who were single mothers by educational attainment/school enrollment status, 2006-2007 averages. Source: Sum et al., 2009.

Together, the results in this section revealed the wide range of important, non-monetary benefits to individuals and society that have been found to be associated with higher levels of educational attainment. That these benefits are not taken into account in CB analyses of programs like the HW-SC program means that their benefit-cost ratios fail to reflect the full value of their benefits and, hence, are underestimated.

CONCLUDING THOUGHTS

The results in this report provide our best estimates of the return on investment to participants and society of the HW-SC program given the data currently available. But as our sensitivity analysis shows, the benefit-cost ratio estimates depend heavily on accurate measures of the effects of the program, most notably the on-time high school graduation rate of participants. Yet, obtaining accurate measures of effects of this type of program is challenging for a number of reasons. First, participation in the program is voluntary, which can result in participants differing in unmeasured, but important ways from non-participants (i.e., selection bias), thereby interfering with the evaluators' ability to distinguish program effects from effects due to differences between participants and non-participants. Moreover, the impact of selection bias likely intensifies over the course of the HW-SC program as long-term retention in the program (i.e., retained group) and the criteria for obtaining Hillside-partner employment (i.e., YETA/employed group) further differentiates participants from each other and from non-participants.

Second, as Hillside's effort to obtain parental consent for the sharing of HW-SC graduates' postsecondary enrollment status shows, it is difficult to obtain accurate and complete outcome data for participants after they leave the program. As a result, assumptions about outcomes for those with missing information need to be made, the accuracy of which may or may not reflect their actual outcomes.

Third, obtaining accurate and complete outcome data for non-participants can be an even greater challenge than for participants, particularly since school districts currently do not track their students after they graduate. Thus, additional assumptions need to be made regarding the outcomes of the non-participants, which pose the same concern about accuracy as noted above.

Although the sensitivity analyses presented in this report aim to take into account these limitations with the data and provide a sense of the range of probable benefit-cost ratios that are most likely to result from the HW-SC program, the best approach for obtaining the most reliable estimates of HW-SC program effects is for Hillside to (1) create an experimental design for participation in the program so that students who want to participate are randomly selected from a large group of willing students (to eliminate selection bias) and (2) setup a longitudinal data system to track over several years both the participants and non-participants from this group to assess differences in their high school and postsecondary outcomes. We recognize that this recommendation would be tremendously challenging for Hillside to implement, but we offer it as an approach to consider, particularly as Hillside expands the HW-SC program into new locales and, hence, may find itself in a position to implement such a design.

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