

The Impact of ABS Program Participation on Long-Term GED Attainment

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Research Brief: The Impact of ABS Program Participation on Long-Term GED Attainment

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About the Author

Dr. Reder earned his PhD from Rockefeller University in 1977, and for the next nearly twenty years he conducted research in West Africa, Alaska, and the Northwest Regional Educational Laboratory. He joined the faculty of Portland State University (PSU) in 1995. His many interests include how adults learn language, literacy skills, language education, and the role of language, literacy, and technology in everyday life. He is an active member of the Literacy, Language, and Technology Research Group (LLTR) at PSU.

As part of his research activities, Professor Reder presents and publishes regularly. He co-edited a book, *Tracking Adult Literacy and Numeracy Skills: Findings from Longitudinal Research*, that was published by Routledge in 2009. His book *The State of Literacy in America* was published by the National Institute for Literacy in 1998. In that year he also co-edited *Learning Disabilities, Literacy, and Adult Education*, published by P. H. Brookes. Dr. Reder has also authored many journal articles and book chapters.

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Introduction

National and international studies such as the recent Survey of Adult Skills¹ provide strong evidence of the need for and economic value of adult basic skills (ABS). A growing body of research indicates that there is a strong economic return on basic skills at given levels of education.² Estimates have been made of the potential economic benefits that would accrue from increased educational attainment and levels of basic skills.³ There is little rigorous research, however, showing that participation in basic skills programs directly impacts the skill levels, educational attainment, or social and economic well-being of adults with low levels of education. Most research on adult literacy development looks only at short-term changes as students pass through single ABS programs. Most studies use short follow-up intervals and consider only program participants, making it difficult to see longer-term patterns of program participation and persistence and assess long-term impact of ABS program participation.⁴

Although ABS program evaluation and accountability reports typically show small gains for program participants in test scores and other outcomes, these studies rarely include comparison groups of nonparticipants, and most studies that do include such controls have not found statistically significant ABS program impact.⁵ Research is needed that compares adult literacy development among program participants and nonparticipants across multiple contexts and over significant periods of time to provide a life-wide and lifelong perspective on adult literacy development and a better assessment of program impact on a range of outcome measures.

The Longitudinal Study of Adult Learning (LSAL) is one such lifelong and life-wide study. LSAL randomly sampled about 1,000 high school dropouts and followed them for nearly a decade from 1998–2007. LSAL followed both participants and nonparticipants in adult literacy programs, assessing their literacy skills and uses over long periods of time, along with changes in their social, educational, and economic status, offering a rich picture of adult literacy development.⁶

This is the third of a series of Research Briefs that utilize LSAL data to examine long-term impacts of ABS program participation on a range of outcome measures. Each Brief looks at a different outcome. The first and second Briefs consider the long-term impact of participation on individuals'

earnings and literacy proficiency, respectively. This third Brief examines the impact of participation on General Educational Development (GED) credential attainment. Subsequent Briefs will examine the impact of participation on engagement in postsecondary education and voting in general elections (a measure of civic engagement).

This Research Brief addresses the following research question: **What is the impact of participating in an ABS program on subsequent GED attainment?**

LSAL Design and Methodology

The overall design, methodology, population, and instrumentation of LSAL are described in detail elsewhere,⁷ and only essential details are summarized here.

Population and Sample

The study population for LSAL was defined as adults who at the start of the study in 1998: lived in the Portland (Oregon) metropolitan area; were ages 18–44; had not completed high school nor were enrolled in high school or college; and were proficient but not necessarily native speakers of English. This defined population is a major segment of the target population of ABS programs operated by community colleges and other organizations in Oregon and across the country. The sample was drawn through random digit dialing, with oversampling of current participants in ABS programs to ensure adequate numbers of both program participants and nonparticipants in the sampled “panel” of 934 adults who then were followed from 1998–2007.⁸ At study onset, the LSAL population had an average age of 28 and was evenly divided among males and females, with one-third from minority groups and one-tenth from immigrant populations. Nearly one in three reported having a learning disability.

Some of these defining characteristics of the LSAL population changed over time. Everyone's age increased, of course, while some adults received GEDs and college degrees, experienced changes in their employment and family situations, or moved away from the Portland area. LSAL followed its panel members regardless of these and other changes, with about 90 percent of the original panel retained in the study until data collection ended in 2007.⁹

Interviews and Assessments

LSAL conducted a series of six periodic interviews and skills assessments in respondents' homes:¹⁰

Wave 1: 1998–1999

Wave 2: 1999–2000

Wave 3: 2000–2001

Wave 4: 2002–2003

Wave 5: 2004–2005

Wave 6: 2006–2007

Note that the spacing of successive interviews was one year between Waves 1, 2, and 3 and two years between Waves 3, 4, 5, and 6.¹¹

Interview Content

The initial interview gathered background information (e.g., demographics, family-of-origin characteristics, K–12 school history). The initial and each successive interview collected information about recent social, economic, and educational activities (e.g., participation in basic skills programs; postsecondary education and training; employment, job characteristics, and earnings; household and family composition; life goals and aspirations).¹²

GED Attainment

By design, no one in the LSAL population had a GED at Wave 1. They were asked in each of Waves 2–6 whether they had prepared for the GED Tests, taken any of the GED Tests, or received the GED credential since the previous interview. More details were obtained through follow-up probes if any of these questions were answered affirmatively. The validity of these self-reports was established by comparing them (with individuals' permission) with Social Security Number (SSN)-matched data in the Oregon GED administrative database. There was a very high level of agreement between the self-reports and administrative records of GED attainment.

Participation in Adult Basic Skills Programs

In each interview, individuals were asked if they currently were participating in adult basic skills programs to improve their reading, writing, or math skills or prepare for the GED Tests, or had done so within the preceding 12 months (asked in Wave 1) or since the time of their preceding interviews (asked in Waves 2–6). Those who reported such participation were asked follow-up questions about timing, intensity, and duration of their participation. In the Wave 1 interview, they

also were asked about their participation in such programs prior to 12 months before their first interview (back to the time they had dropped out of high school). These reports about ABS program participation were converted into variables for the number of hours of participation in each time period.

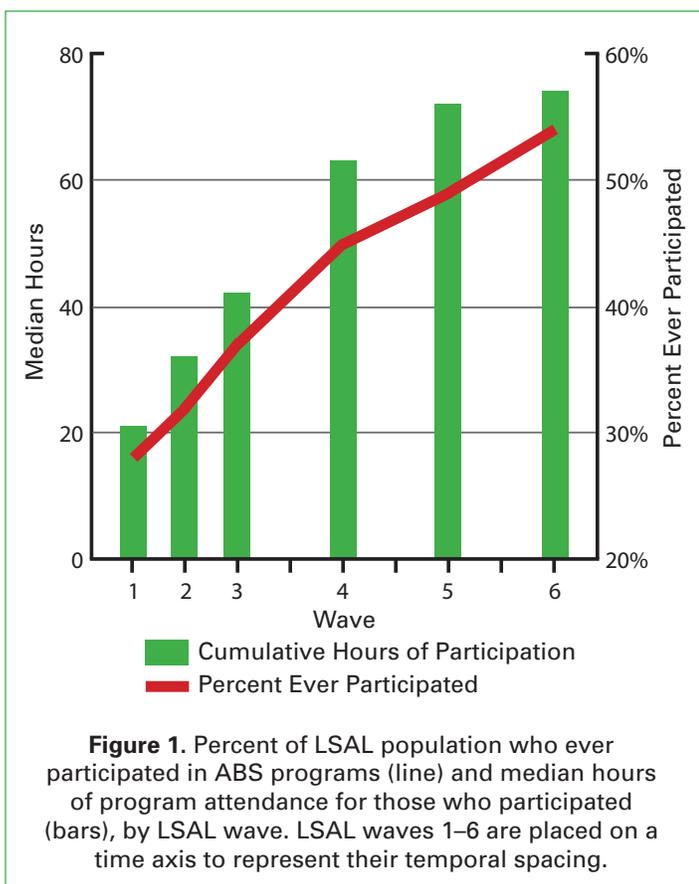
Key Findings

About two-thirds (68%) of the LSAL population participated in ABS programs between the time of leaving high school and the end of LSAL in 2007. This is much higher than the usual reported percentage of the adult education target population that is served in a given program year. There are several reasons for LSAL's higher participation percentage: (1) LSAL's 68 percent figure includes any participation over a long period of time rather than in a single year; (2) LSAL's population excludes adults age 45 and above, an age group usually included in official counts of the target population but one that rarely participates in programs; and (3) LSAL's figure includes *any* participation rather than the 12-per-year minimum hours typically required for inclusion in state and federal program reports.

Participation patterns in LSAL were often complex and fragmented, with many adults having multiple episodes of participation at different times and in different programs across the years of the study.¹³ **Figure 1** (page 3) shows the estimated percentage of the LSAL population that ever participated in an ABS program through each given wave of the study (line graph), as well as the median total hours of program attendance accumulated by participants (bar graph).¹⁴ By the end of the study in 2007, over half (54%) of the LSAL population that had never participated in ABS programs when LSAL began had participated in ABS programs, accumulating a median of 65 hours of attendance between 1998 and 2006.

Figure 1 shows that most participation occurred early in the study. Two-thirds (68%) of those who participated in ABS programs by Wave 6 started participating by Wave 3; 53 percent of all ABS participation hours reported through Wave 6 occurred by Wave 3. Slightly more than half (55%) of those who participated reported two or more periods of participation across the LSAL waves.

Overall, about one in four individuals (27%) in the LSAL population attained a GED by the end of the study. These individuals received their GEDs during the various waves of the study, as shown in **Table 1** (recall that, by definition, no individuals had received GEDs by Wave 1).



Individuals prepared for the GED Tests using a variety of methods. Previous research that surveyed GED test takers as they took the exams indicates that some individuals do not prepare at all while many others prepare by participating in formal ABS programs, engaging in self-directed study using various preparatory materials, or using a combination of these methods.¹⁵ A similar mix of methods can be seen in the LSAL data, in which individuals were asked whether they had (1) participated in ABS programs to improve their reading, writing, or math skills or prepare for the GED Tests, or (2) engaged in self-directed study to improve their reading, writing, or math skills or prepare for the GED Tests.¹⁶ **Figure 2** displays percentages of the LSAL population who had participated in ABS programs and/or self-study prior to the time they received GED credentials.¹⁷

The largest group in **Figure 2** comprises individuals who *both* participated in ABS programs and self-studied to improve their basic skills or prepare for the GED Tests. Slightly more than one in three (36.2%) did both of these activities, most often in different time periods.¹⁸ The smallest group (11.1%)

comprises individuals who participated in ABS programs but never self-studied. Individuals who self-studied but never participated in ABS programs numbered nearly one in four (23.6%) of the LSAL population, and individuals who neither participated in a program nor self-studied comprised the balance (29.1%) of the LSAL population.

Estimating the Impact of Program Participation on GED Attainment

The rate of GED attainment was higher among individuals who participated in ABS programs (35%) than among nonparticipants (25%). This overall difference between participants’ and nonparticipants’ GED attainment rates may reflect the impact of ABS program participation on preparation for taking the GED Tests. Care must be taken, however, in evaluating and interpreting these differences. First, individuals self-selected in terms of participating in ABS programs, and there may be other important differences between the two groups. Effects of those other differences may be confounded with effects of participation; this often is termed *selection bias* in program evaluation literature.¹⁹ Some selection bias in LSAL could be due to differences in observable characteristics of participants and nonparticipants such as age, amount of education, race/ethnicity, immigration status, and so on. *Propensity score matching* methods are used to control for selection bias attributable to these observable individual characteristics. A propensity score in this context can be thought of as an estimated probability that an individual is a participant (received the “treatment” of ABS

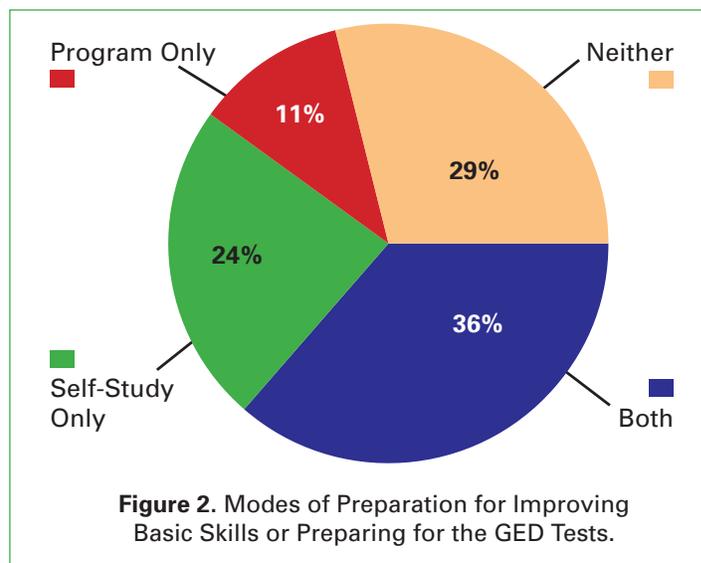


Table 1. Cumulative Percentage of LSAL Population Who Had Received GED Credentials by Each Wave

Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
0.0	12.0	15.3	21.6	24.4	27.0

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programs) versus a nonparticipant (did not receive “treatment” and therefore can be thought of as a member of a “control” group).

Propensity scores were calculated for predicting participation in ABS programs using individuals’ age, gender, race/ethnicity, age at school dropout, years of schooling completed (before dropping out), presence of learning disabilities, enrollment in special education classes in school, immigration status, and level of parental education. These propensity scores were matched²⁰ to identify groups of participants and nonparticipants (which aside from their participation status were statistically alike).

These matched propensity scores were used to estimate *average treatment effects* of participating in ABS programs on GED attainment. The actual GED attainment of individuals who participated in programs was compared with the attainment they would have received had they not participated in those programs (a so-called *counterfactual*). With participation defined as *any* amount of program attendance, the average treatment effect on the treated (ATET) was calculated for six different LSAL subpopulations to explore the variation and robustness of the estimated ATET over different assumptions about contrasting groups of participants and nonparticipants. Contrasts were drawn between all participants and nonparticipants, between participants and nonparticipants who had GED attainment as an explicit goal (or not), and between participants and nonparticipants who self-studied to improve basic skills or prepare for the GED (or not). Details of these models and their results are given in the Appendix.

Table 2. ABS Participation and GED Attainment

Hours of ABS Program Attendance Before GED Receipt	Percentage of LSAL Population	Percentage Receiving GED
100 or more	16.9	46.4
1-99	31.6	27.2
0 (no participation)	51.5	25.9
TOTAL	100.0	29.7

Note: ABS program attendance excludes data from waves following receipt of GED.

All six models, which make varying assumptions about LSAL subpopulations to estimate the impact of participation, show substantial and statistically significant treatment effects. These estimated ATETs range between .20 and .32, depending on the specification. According to these results, the rate of GED attainment was substantially higher among ABS program participants because of their participation.

The Appendix provides additional information about the impact of participation estimated by the six models. The GED

attainment rates for ABS program participants were between 0.35 and 0.38. The treatment effects models estimated that had participants not in fact participated in ABS programs, they would have had GED attainment rates between 0.04 and 0.16, depending on the model. The largest impact was estimated by a model that considered only individuals with explicit GED aspirations. The GED attainment rate for these ABS participants was 0.36, compared with an estimated rate of 0.04 had they not participated in ABS programs.

Effects of Intensity of Participation

Other Research Briefs in this series have found that the impact of program participation on an outcome can vary markedly with the intensity of program attendance. For example, 100 or more hours of program attendance have been found to have a substantial impact on future earnings and literacy proficiency, whereas minimal hours of participation have not had a systematic impact on those outcomes. For the GED outcome considered here, intensity effects of participation may not be as easily characterized.

Because *any* amount of participation, considered as a binary in the treatment effects models described above, had substantial impact on GED attainment, interpreting differences among the ATETs corresponding to different intensities is not straightforward. These ATET values are not comparable because they contrast distinct subpopulations. What is important is that each reflects a substantial and statistically significant impact.

Table 2 displays the percentage of the LSAL population comprising three participation groups: (1) those who did not participate in ABS programs; (2) those who participated in ABS programs for 1–99 hours prior to receiving GED credentials; and (3) those who participated for 100 or more hours. The table displays the percentage of individuals in each group who attained GED credentials by the end of LSAL.

Although the subpopulation who participated in ABS programs 100 or more hours is relatively small (16.9% of the LSAL population), nearly half of these individuals (46.4%) received GED credentials. The group who participated fewer than 100 hours in ABS programs is larger (31.6% of the LSAL population), but a considerably smaller percentage (27.2%) of these individuals obtained GEDs. About half of the LSAL population (51.5%) did not participate at all, yet about one-fourth (25.9%) of these individuals received GED credentials.²¹

Discussion

The central finding of this Research Brief is the robust impact of ABS program participation on GED attainment. GED attainment rates were elevated by 0.20 to 0.32 by ABS program participation, depending on the population modeled. Although individuals used a variety of methods for GED preparation, including ABS program participation, GED attainment rates for all groups appear to have been elevated substantially by program participation.

There are some important methodological limitations to these analyses. The treatment effects models are based on propensity score matching to control selection bias, which relies on observable individual characteristics but does not control for unobserved individual characteristics. Although educational aspirations measured at Wave 1 were controlled in the analyses, there is not ample *pre-participation* data available about individuals' educational aspirations, so the analyses may confound the impact of participation on GED *goal formation* with its impact on GED *goal attainment*. In addition, the analyses have not examined GED test scores and passing rates but only the ultimate outcome of receiving the GED credential. Despite these limitations of methodology and of collapsing multiple steps of the GED testing process into a binary outcome, analyses of the LSAL data provide strong evidence of the importance of ABS programs in supporting GED attainment.

Additional research with larger longitudinal data sets and those drawn from other contexts can help clarify some important details not systematically considered in these analyses. Participation impact models developed here could be extended and more fully evaluated if applied to larger longitudinal data sets that follow comparable ABS program participants and nonparticipants and incorporate administrative data from GED testing.

Notes and References

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 - 8 Sampling weights calculated for each panel member were used to make estimates for the defined target population from the sampled panel data.
 - 9 Analysis of missing interviews indicates that they were *missing at random* (MAR) with respect to the variables examined.
 - 10 Respondents were paid for each of these sessions.
 - 11 Individuals were interviewed at about the same time in each wave so that there was approximately constant spacing among individuals’ successive interviews and assessments (e.g., a respondent interviewed in February 1999 in Wave 1 was interviewed during February 2000 for Wave 2, February 2001 for Wave 3, etc.).
 - 12 The interview instruments are available at www.lsal.pdx.edu/instruments.html.
 - 13 More detailed discussion is given in: Reder, S. & Strawn, C. (2001). Program participation and self-directed learning to improve basic skills. *Focus on Basics*, 4 (D), 14-17.
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 - 15 McLaughlin, J. W., Skaggs, G., & Patterson, M. M. (2009). *Preparation for and performance on the GED® test*. Washington, DC: American Council on Education, GED Testing Service.
 - 16 Individuals who indicated they had worked on their own to improve their reading, writing, or math skills or prepare for the GED Tests were asked follow-up questions to make sure those activities were not assigned by teachers as “homework” for any classes they might have been taking at the same time.
 - 17 ABS program participation and self-study rarely were reported for a wave *after* the wave in which an individual received a GED. Such post-GED activities are not included in this figure or in analyses of relationships between participation/self-study and GED attainment.
 - 18 These categories were calculated from activity data from waves up to the wave in which GED attainment was reported but not in subsequent waves; for individuals who did not receive a GED, the categorization is based on activity data from all waves.
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 - 20 Probit models were used to generate propensity scores, which were balanced within a region of common support for participants and nonparticipants.
 - 21 The direct comparison of groups in **Table 2** must be interpreted with caution since propensity matching was not used to make these groups statistically comparable.

Appendix: Supplementary Information and Tables

With participation defined as *any* amount of program attendance, the ATET was calculated for six different LSAL subpopulations to explore the variation and robustness of the estimated ATET over different assumptions about contrasting groups of participants and nonparticipants. The model specifications and corresponding ATET estimates for these six subpopulations are labeled Models A through F in **Table A1** below. For each model, the table shows number of “treated” individuals (i.e., participants in ABS programs), number of propensity score-matched “controls,” estimated ATET, standard error of the estimate, and *t*-value from the test of statistical significance. Model A contrasts participants

B is statistically significant (ATET=0.322, std. err.=0.059, $t=5.476$, $p<.001$). The Model B ATET value of 0.322 is much larger than that of Model A, as might be expected given that Model B estimates program impact on GED attainment for the subpopulation who had that outcome as a stated goal.

Models C through F commonly limit analysis to individuals who first participated in ABS programs no more than 12 months before the Wave 1 interview. For this subpopulation, additional details are available about the extent of program participation as well as about self-directed study to improve basic skills or prepare for the GED test. Model C estimates a statistically significant treatment effect within this

Table A1. Treatment Effects Models of Program Impact on GED Attainment

Model	Exclude Pre-Wave 1 Participants	Exclude No GED Goal	Exclude No Prep	N Treated	N Control	ATET	Std. Error	<i>t</i>
A				583	186	0.203	0.050	4.103**
B		X		470	146	0.322	0.059	5.476**
C	X			416	160	0.282	0.053	5.291**
D	X	X		331	103	0.262	0.072	3.615**
E	X		X	416	81	0.299	0.067	4.463**
F	X	X	X	331	52	0.233	0.081	2.869*

* $p<.01$; ** $p<.001$. Note: N Treated and N Control refer to actual nearest neighbor matches of propensity scores.

and nonparticipants within the entire LSAL population. This model includes all of the subpopulations that were excluded from analyses in one or more of Models B through F. The ATET estimated by Model A is statistically significant (ATET=0.203, std. err.=0.050, $t=4.103$, $p<.001$). The ATET value of 0.203 indicates that the estimated proportion (ranging between 0 and 1) of ABS participants attaining GED credentials was 0.203 higher than it would have been had they not participated.

In Wave 1 interviews, individuals were asked about their educational aspirations, including GED attainment. Although most LSAL adults (82%) reported GED attainment as a goal at that time, 18 percent did not have that goal. Thus, some individuals who did not subsequently receive GED credentials did not have GED attainment as a goal. Model A thus estimates participation impact on GED attainment for a mix of individuals, some who sought GED credentials and some who did not. To better specify impact, Model B focuses the analysis on individuals who had GED attainment as a goal. **Table A1** shows that the ATET estimated for Model

subpopulation (ATET=0.282, std. err.=0.053, $t=5.291$, $p<.001$). Model D focuses analysis on a subset of the subpopulation considered by Model C—namely, those who had GED attainment as a stated goal. The treatment effect estimated by Model D is statistically significant (ATET=0.262, std. err.=0.072, $t=3.615$, $p<.001$).

Models E and F use different methods to identify the relevant subpopulation for program impact modeling. Models B and D estimate program impact only among individuals who had GED attainment as an explicit goal. Model E, in contrast, estimates program impact only among individuals who had prepared for taking the GED Tests, either by attending ABS programs or by self-directed study (or both) prior to attaining GED credentials.¹ Model E estimates a statistically significant treatment effect within this subpopulation (ATET=0.299, std. err.=0.067, $t=4.463$, $p<.001$). Model F estimates program impact among individuals who had GED attainment as an

1 These LSAL data are limited insofar as they do not distinguish whether these activities were specifically for GED preparation as opposed to improving basic skills for other reasons.

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explicit goal *and* prepared for taking the GED Tests. Model F estimates a slightly smaller and statistically significant treatment effect within this subpopulation (ATET=0.233, std. err.=0.081, $t=2.869$, $p < .01$).

All six models, which make varying assumptions about LSAL subpopulations to estimate the impact of participation, show substantial and statistically significant treatment effects. These estimated ATETs range between .20 and .32, depending on the specification. According to these results, the rate of GED attainment was substantially higher among ABS program participants because of their participation. **Table A2** provides additional information about the impact of participation estimated by these six models. For each model, the table shows the observed GED attainment rate for those who had participated in ABS programs as well as the counterfactual treatment effects estimate of their GED attainment rate had they not participated in ABS programs.

The GED attainment rates for ABS program participants were between 0.35 and 0.38. The treatment effects models estimated that had participants not in fact participated in ABS programs, they would have had GED attainment rates between 0.04 and 0.16, depending on the population modeled. The largest impact was estimated by Model B, which considered only individuals with explicit GED aspirations. The GED attainment rate for these ABS participants was 0.36, compared with an estimated rate of 0.04 had they not participated in ABS programs. The smallest impact was estimated by Model A, which considered the entire LSAL population. The GED attainment rate for ABS participants was 0.36, compared with an estimated rate of 0.16 had they not in fact participated in ABS programs.

Table A2. Observed GED Attainment Rates for ABS Participants and Counterfactual Estimates of GED Attainment Rates Had Participants Not Participated

Model	Exclude Pre-Wave 1 Participants	Exclude No GED Goal	Exclude No Prep	Observed GED Attainment Rate for ABS Program Participants	Counterfactual Estimate of GED Attainment Rate for ABS Participants Had They Not Participated
A				0.36	0.16
B		X		0.36	0.04
C	X			0.35	0.07
D	X	X		0.38	0.12
E	X		X	0.35	0.05
F	X	X	X	0.38	0.15