



Evaluation of Small Steps Big Changes

Report on Attempt to Apply Cost-Benefit Analysis

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Introduction

This paper sets out our findings from an attempt to apply cost benefit analysis (CBA) to Small Steps Big Changes. CBA is a method that is used by economists to determine the effect that a project has on social welfare. It is based on assigning monetary values to relevant economic costs and benefits associated with a project and if the benefits outweigh the costs the project is deemed worthwhile. The application of such an approach to Small Steps Big Changes might appear to be a futile exercise. How do we possibly assign a monetary value to interventions that target pre-school children? This is clearly a difficult exercise but is nevertheless one that has been tackled elsewhere, most notably in the United States of America.

Before presenting the findings from an attempt to apply CBA to Small Steps Big Changes as part of the wider evaluation project, we briefly set out the principles of CBA and review the literature, both academic and non-academic, where CBA has been applied to pre-school interventions. A number of influential studies in the academic economics literature are based on the HighScope Perry Pre-School project in Michigan and the Carolina Abecedarian project in the USA. In the UK there are a small number of studies on publicly funded pre-school education initiatives. This literature review provides the basis for the approach that we intended to apply in the evaluation of Small Steps Big Changes. In particular the literature review highlights the nature of the benefits that we might expect to be generated and how it would be possible to generate monetary values for these, along with the findings from previous CBA studies.

We had then intended to present our findings for Small Steps Big Changes including, where possible, a breakdown of the results for constituent projects of Small Steps Big Changes. However as the evaluation proceeded it became apparent that this was not going to be possible. Instead we report on the challenges that were encountered so that these can be addressed in any future evaluation of this type of activity.

Principles of Cost Benefit Analysis

This section briefly sets out the general principles of CBA. The overall objective of a CBA is to determine whether or not a project contributes to social welfare (see Boardman et al (2018) for an introductory textbook discussion). There are a number of steps to conducting a CBA:

1. *Identification of costs and benefits.* CBA requires that all relevant costs and benefits associated with a project are identified. It is important to note that the requirement is for economic costs and benefits, which may differ from the more familiar concept of financial costs and benefits. At this stage it is also important to identify who has standing in the CBA i.e. to ask who incurs the costs and who do the benefits accrue to?
2. *Generation of monetary values.* In order to assess a project and to compare it to alternatives, placing monetary values on the types of costs and benefits identified in the previous step is necessary. This is typically the most challenging part of any CBA exercise because for many projects appropriate market prices that fully reflect the opportunity cost of the use of a resource or the willingness to pay for a particular benefit do not exist. Shadow prices often need to be generated and this can be a resource intensive process.
3. *Discounting over time.* It is rarely the case that a project runs and is completed within a year. Where projects, and the stream of costs that are incurred and benefits that they generate, run over a number of years these values need to be discounted, which takes into account the fact that society is generally impatient and prefers to consume today rather than later.

This process effectively weights the value of costs and benefits over time, with smaller weights applied the further into the future we go.

4. *Presentation of results and sensitivity analysis.* The final step is to conduct sensitivity analysis and to present the findings. In the preceding three steps the CBA practitioner will make a number of assumptions, the nature of which means that they should be tested to assess the robustness of the findings. Finally the findings will be presented in terms of a net present value (NPV), a benefit-cost ratio (BCR) or internal rate of return (IRR). A positive NPV or a BCR greater than one means that the benefits outweigh the costs. The IRR is a little different. This essentially asks what is the discount rate that means that the NPV is equal to zero. This is compared to a market rate of return and if higher than this market rate the project is deemed as worthwhile.

CBA has been applied to publicly funded projects across a range of policy areas, including social policy. Despite it being established as a key tool in the evaluation practitioner's toolbox, it remains controversial for a number of reasons.

First of all, CBA is not a value-free technocratic exercise. The process of monetary valuation generally makes the very strong assumption that the marginal utility of additional consumption is the same for everyone i.e. it ignores distributional issues and assumes that an additional pound of income is equally valued by rich and poor alike. It is possible to recognise this as a theoretical shortcoming of the approach but it is a very difficult problem to address. A lack of relevant data means that attempts to incorporate distributional weights into the analysis is just as arbitrary an exercise as assuming equal weights. This concern is clearly relevant for projects such as Small Steps Big Changes which are deliberately targeted at disadvantaged groups.

Secondly, it is argued that the process of discounting means that we are placing greater weight on the value of consumption of the current generation compared to future generations. Projects with high up-front costs and a long term stream of benefits are likely to be rejected by a CBA exercise because the process places a greater weight on the up-front costs. This has long been recognised by economists as controversial, with some arguing that all generations should be treated equally. Nearly a century ago Ramsey (1928) called the process "a practice that is ethically indefensible". This is not the position that is adopted by governments who issue guidance on how CBA of publicly funded projects should be conducted. Again, this is relevant for a project such as Small Steps Big Changes as many of the benefits from early life interventions accrue much later in life. In the UK HM Treasury prescribes the discount rate to be used in the analysis of publicly funded projects. The review below demonstrates the difference that the choice of discount rate can make to the results of a cost-benefit exercise.

Subsequent sections will expand on these general points in the context of a literature review of cost benefit analyses of provision of pre-school/early life interventions. Before that it is useful to state the economic rationale for these types of intervention. Currie (2001) suggests that there are both *equity* and *efficiency* justifications for these interventions. The equity justification is based on the idea of addressing unequal opportunities and life outcomes. The efficiency justification is based on the presence of market failures such as liquidity constraints which prevent parents from investing in activities that will improve the human capital (and standard of living) of their children; information failures whereby parents find it difficult to assess the quality of pre-school care; and a range of externalities associated with education and development such as spillover benefits that accrue to other children.

Findings from the Literature

This section reviews the findings from the economics literature on the nature of the benefits from pre-school/early life interventions and their value for money. Although particular projects and studies will be noted the aim is to draw out some broad conclusions that relate to these types of intervention, which take many forms. Some are small scale model programs while others are large scale public policy interventions. In some projects the balance of activity is centre based rather than home based and vice versa. Some projects begin with prenatal activities. The mix of activities between child and parent often varies. They all, however, share the common aim of improving the lives of children that they target.

The Value for Money of Pre-School Interventions: The Case of the USA

This sub-section presents a brief description of the HighScope Perry PreSchool project in Michigan and the Carolina Abecedarian project before reviewing the economics literature that they have generated. These two projects have been extremely influential in a number of ways. They were designed and implemented with specific features that made them amenable to economic analysis, including the use of treatment and control groups and longitudinal data collection (that has continued over decades in some instances). They have provided a template for the design, implementation and evaluation of pre-school/early life interventions. These fall into the category of small scale model projects. We will also consider the literature on the Chicago Child-Parent Centers and Head Start as examples of large scale public policy interventions.

The HighScope Perry PreSchool project was implemented in Ypsilanti, Michigan in 1962 (see highscope.org for more information on this project). It had 123 participants, all 3 or 4 year old African American children from disadvantaged backgrounds who were at risk of failing school. Children were randomly assigned to a treatment group or a control group. The treatment group received centre-based activities for 2 ½ hours per weekday, home visits and group meetings of parents. Data was collected on entry and each year up until the age of 15. In order to capture the long term benefits of the project follow up surveys were conducted at the ages of 19, 27 and 40.

The HighScope Perry PreSchool project has been subject to a number of cost-benefit studies, conducted by different research teams at different points in time. Here we limit the review to a selection of the more recent studies. Temple and Reynolds (2007) used the age 27 follow-up data and report a BCR of around 7.2. Nores et al (2005) and Belfield et al (2006) analysed the age 40 follow-up data and also found that the benefits of the project significantly outweighed the costs. One dollar of investment in the project generated \$12.90 (at a discount rate of 3%) or \$5.67 (at a discount rate of 7%) of benefit.

Heckman et al (2010a) have raised concerns about results from studies of the HighScope Perry PreSchool project. Their concerns fall into three categories: the small sample size; that the randomisation process was compromised; and that the testing of large numbers of outcomes and hypotheses could lead to what they describe as selection of significant estimates from a large pool of candidates. After accounting for these concerns they still report statistically significant economic benefits from the project. In subsequent work Heckman et al (2010b) report on the rate of return and find that, even after addressing these methodological issues, there is still a substantial net benefit with benefit cost ratios of 7.1 to 12.2 (3 % rate of discount) and 2.2 to 3.9 (7% rate of discount) depending on the assumptions made about some of the benefits.

There is clearly some variation in the results from these studies. The general finding is that the HighScope Perry PreSchool project has generated significant benefits to its participants and to society over and above the costs of the programme. Can the variation in the magnitude of the

results be explained? The answer to this question is yes - and it is the benefits that have been included and how they are measured that can explain a lot of this variation. The results reported in previous paragraphs have highlighted the role that the choice of discount rate can play. Appendix Table 1 shows, for each of the studies cited above, the types of benefits included in the analyses and while there is consistency in the broad headings, there is some variation in the detail.

The Carolina Abecedarian project began in 1972 and tracked a cohort of 112 children from disadvantaged families. The majority of the participants were African American. Age of entry was lower than the HighScope Perry PreSchool project, at around 6 weeks. The project was also much more intensive providing all day care over a 5 year period. The project was centre- based and in addition to the education program, nutrition and medical services were also provided. It is important to note that costs of the program reflect its resource intensity when considering the size of the BCRs reported below. Participants in this project were also tracked over time and in addition to data collected during participation follow up surveys were conducted at the ages of 12, 15, 21, 30 and 35. Information on the project can be found at <https://abc.fpg.unc.edu/>.

The Abecedarian project has also been extensively studied, with a number of researchers applying the cost-benefit analysis technique to determine its value for money. Barnett and Masse (2007) use data from the age 21 follow up and report positive NPVs of \$12,372 (7% discount rate) to \$94,802 (3% discount rate) per child. Temple & Reynolds (2007) in their study of preschool investments in education report a BCR of 2.69 for the Abecedarian project, again using the age 21 follow up data. Elango et al (2015) make use of the age 35 follow up surveys and report a BCR of 3.2 and an IRR of 11%. Garcia et al (2019) adopt a different approach and generate synthetic cohorts using a combination of experimental and non-experimental data to forecast the lifecycle benefits of the project. This involves using an older cohort of non-participants who are otherwise comparable to the treated and control groups in order to identify the treatment effects of individuals when they are older. This study generated an IRR of 13.7% and a BCR of 7.3.

As with the HighScope Perry Preschool project, there is wide variation in the results as different research teams have used different data and methodologies. Nevertheless, the consensus that emerges is that the Carolina Abecedarian project generated significant benefits over and above its cost.

The HighScope Perry Preschool project and the Carolina Abecedarian project are small scale demonstration projects. This raises the question: do large scale projects generate the same benefits and returns on investment? Research into the Chicago Child Parent Centers project and Head Start suggest that the answer is yes.

The Chicago Child Parent Centers project began at more than 20 sites in the most disadvantaged parts of Chicago that lacked other preschool provision in the early 1980s. Children were eligible at age 3 and support could continue up until age 9. The preschool program was a part day program that supplemented educational activities with a parent program, home visits and health services. The Chicago Longitudinal Study has tracked participants (around 990) and non-participants (around 550) over time. Using data from this study from the age 21 follow up, Reynolds et al (2002) found a BCR of 7.14 for the preschool program. The age 21 follow up data was also used by Temple and Reynolds (2007) who reported a BCR of 6.87. Reynolds et al (2011) find a BCR of 10.83 using the age 26 follow up data. Again the results from the literature are suggestive of this larger scale programme generating significant returns on the funds invested.

Head Start is a federally funded early education programme in the USA. Three and four year olds are eligible if family income is below the poverty line. There are six elements to the programme: education, parental involvement, nutrition, social services, mental health services and health services. It began in 1965 and has been the subject of many evaluation studies, many of which focus on particular aspects of the delivery of Head Start, that have taken place at different times since 1965, using a range of methodologies (including experimental and non-experimental approaches). Very few of these studies have included a full cost-benefit analysis and those that do have not capture the full range of benefits (Elango et al (2015)) that accrue from these types of project. Recent studies include: Ludwig & Miller (2007) who explore educational attainment and mortality; Deming (2009) who explores the impact on young adult outcomes; Carneiro & Ginja (2014) who explore health and behavioural outcomes; and Kline & Walters (2016) who explore the importance of alternative provision when evaluating programmes such as Head Start. Carneiro & Ginja (2014) suggest that “the internal rate of return of the program is at least 4%”, while Kline & Walters (2016) present a preferred BCR estimate of around 1.8. Given the nature of these studies these figures should be treated with a degree of caution but they are nevertheless suggestive of a positive rate of return on investment.

The Value for Money of Pre-School Interventions: The Case of the UK

In the UK there have been a number of CBA studies published on the impact of early life/preschool interventions. They are, however, fewer in number than for the USA and tend to report on large scale interventions. The recent studies that are reviewed below have adopted various elements, as appropriate, from the methodologies developed in the studies from the USA outlined in the previous sub-section.

Cattan et al (2014) report on the economic benefits from preschool education for a cohort that did not have access to universal preschool education as part of the Effective PreSchool Primary and Secondary Education (EPPSE) project. They explore the long term educational and labour market benefits. They use educational outcomes at age 16 to estimate the likely difference in employment and earnings from preschool education and report on the costs and benefits to the exchequer of preschool education. Those children among the EPPSE sample who received an average quality preschool experience are estimated to go on to earn an average of an additional £27,000 (discounted) over their working lives compared to those with no or minimal preschool experience. The gross saving to the treasury from this additional lifetime earnings is estimated at £11,000 per preschool attendee.

A number of papers from the Study of Early Education and Development (SEED) project have explored the value for money of early education. Blainey & Paull (2017) reported on the cost information that was collected from 166 settings that delivered early education which included childminders, maintained nursery schools and local authority/children’s centres. They use this to calculate unit costs of delivery. Paull & Xu (2017) and Paull et al (2020) report on the benefits and provide benefit cost ratios respectively based on the same data. The BCRs reported by Paull et al (2020) are modest, with higher ratios associated with verbal development rather than socio-emotional development. They suggest caution on the use of these ratios as there is some uncertainty in the underlying impact analysis on which they are based.

The Sure Start project, which began in 1999 offering families with children aged below 5 a range of childcare, early education, health services and parenting support, has been the subject of a number of evaluation studies that have assessed its impact on a number of outcome measures (see Cattan et al (2019) on the health impacts for example). Some of the economics of the impact of Sure Start,

including the nature of the benefits, are discussed in DfE (2011). Ellison et al (n.d.) have reported on cost effectiveness¹ in Sure Start local programmes and the difficulties evaluators have found when conducting this exercise. However there is little research that attempts to monetize the full range of benefits and include them in a comprehensive CBA. A Nuffield Foundation funded project is currently underway that will seek to do this and is due to report in the second half of 2023 (see the following for more information: <https://www.nuffieldfoundation.org/project/evaluating-short-and-medium-term-impacts-sure-start>).

Following the beginning of the Sure Start project, Children's Centres were launched in 2002. These centres provide multiple services in one location and are currently the subject of major programme of evaluation. There are five strands to the Evaluation of Children's Centres in England (ECCE) project and one of these addresses their value for money. Gaheer and Paull (2016) report on the results of an analysis based on twenty four centres located in the 30% most deprived parts of England. Their original intent was to report on the value for money of the centres but they note that aggregate service use had no statistically significant relation with better outcomes (Gaheer and Paull (2016)). Instead the value for money exercise is based on individual services (baby health, child play, parent support and specialist parent/family support). The BCRs that they report are as follows:

- Baby health: depending on how the benefit is measured the BCRs for this service are 0.5 (benefit via strengths and difficulties questionnaire) and 1.38 (benefit via home learning environment score);
- Child play: a BCR of 1.81;
- Parent support: a BCR of 3.12 or 6.49 depending upon the time frame used; and
- Specialist parent/family support: a BCR of 3.62 or 6.47 depending on the time frame used.

These results from the ECCE project show that CBA can be sensitive to the measurement of relevant benefits (baby health) and that overall these services generate a positive net benefit. The driver of the positive net benefit is the estimated increase in future lifetime earnings.

Although not as comprehensive as the literature from the USA, these UK studies are also suggestive of the value for money of preschool/early education interventions.

Some General Principles of the Application of CBA of Pre-school/Early Life Interventions

A number of papers, for example Currie (2001), Vining and Weimer (2009) and Karoly (2012) have provided reviews of impact evaluation and cost-benefit analyses of early childhood/preschool interventions. This section draws upon these papers and those cited in the previous section to highlight a number of common themes from the literature that can inform the application of cost-benefit analysis to these types of project.

In line with the first principle of CBA set out above, there is the need to think carefully about the nature of the costs and benefits to be included in the exercise. For the cost side of the equation we need to go beyond the financial cost associated with grants or other types of funding and to include costs such as those associated with staff time, premises and other in kind activities (Karoly (2012)). On the benefits side it is clear that a long term perspective is crucial (Karoly (2012)). The positive CBA results reported in the previous section rely on an accumulation of benefits over time so this

¹ Cost effectiveness explores the costs involved in delivering a set of outputs. The aim of the exercise is to determine a unit cost for the output in question. This is clearly less data intensive compared to a CBA but can still be difficult to implement because the total economic cost of the intervention still needs to be calculated. See Boardman et al (2018) for an introductory discussion.

requires data collection that continues after the provision of support has ended (e.g. Nores et al (2005); Belfield et al (2006)) or a model that allows us to link short term outcomes that can be observed while the intervention is taking place with the longer term benefits that account for the greater proportion of the total benefit (e.g. Cattan et al. (2014)). The research has also noted the importance of good project design with clearly identified treatment and control groups (Currie (2001); Heckman et al (2010)) and an understanding of alternative forms of provision when quantifying the scale of the benefits (Kline & Walters (2016)).

These longer term benefits are also important in relation to the second principle, that all costs and benefits have monetary values. While it is, in principle, straightforward to generate monetary values that could be used for short term outcomes such as avoided costs of remedial education, the immediate value of educational or health outcomes for preschool children simply have no market value and, therefore, no way to generate a monetary value. Monetary valuation does become possible when the short term outcomes generate long term benefits such as improved labour market benefits such as higher employment rates and earnings. Karoly (2012) notes that valuations that are consistent with economic theory are not always used in practice. This could be due to data limitations or resource constraints for example.

The third principle, that of discounting, also relates to the long term nature of some of the identified benefits. A number of the studies (particularly those from the USA) have demonstrated that the *scale* of the result is sensitive to the choice of discount rate. This is less of an issue in the UK where there is prescriptive guidance on how to approach this. It does, however, need to be borne in mind when interpreting and using the results given the reliance on long term benefits in generating positive assessments of value for money.

Finally in this section we return to distributional considerations. The literature that has been reviewed above is almost entirely based upon studies of projects that are targeted at the more disadvantaged in society. If we assume that £1 of additional income is more beneficial at the bottom 10% of the income distribution than at the top 10% then a CBA that does not take this into account is incomplete (Vining & Weimer (2010)) and is likely to understate the value for money of the project.

Methodology

We were clearly unable to implement the type of long term longitudinal exercise that has been pioneered by the HighScope Perry PreSchool and Carolina Abecedarian projects. Our proposed approach, which was based on Cattan et al (2014) and Gaheer & Paull (2016) would nevertheless have included some of the wider benefits to society that most studies capture but rely on estimates of future labour market outcomes as the main source of benefit.

On the cost side of the equation two sources of would need to be considered: the financial cost of Small Steps Big Changes; and other costs such as staff time, premises, project management and the like. This would give us the total economic costs of the project.

On the benefits side of the equation our starting point would be an assessment of the impact of the project on key short term educational measures used in the wider evaluation. A stream of benefits that includes the following would then have been estimated on the basis of existing secondary data :

- Reductions in special education needs;
- Reductions in truancy;
- Reductions in adult crime;

- Reductions in smoking;
- Reduced depression; and
- Increased lifetime earnings.

In line with current HM Treasury guidance discount rate of 3.5% would be applied to the first thirty years of benefit and a declining schedule of rates after that (HM Treasury 2020).

Findings and Recommendations

As we began to explore what would be required to make our approach to CBA work it became apparent that it would be very difficult and eventually we had to draw a line under the exercise. Initially the aim was to conduct a CBA for each of the components of the Small Steps Big Changes project, along with an overall assessment. It turned out, for various reasons, that neither of these proved possible. We have learned that a number of challenges proved insurmountable to completion of a CBA study of Small Steps Big Changes. We report those here with the intention that they could be used to inform the development of any future project and its evaluation:

- Clear objectives with associated measures: appropriate indicators that allow the objectives of the project to be quantified should be clearly identified before the implementation of the project. It is much easier to build data collection into the delivery of the project than to attempt (costly) retrospective data collection, which is often not possible to do. In any future project our recommendation is that these measures be agreed and the means of data collection put in place before delivery begins;
- Treatment and control groups: establishing the impact of a project such as Small Steps Big Changes would ideally involve the establishment of a treatment group that receives support and a control group that doesn't. With an early childhood intervention there are clearly ethical concerns with this but there are ways that it could be done. One way would be through the use of comparable (socio-economic) areas and administrative data. An alternative might be to offer two levels of support with the 'low intensity' support as the control group and the 'high intensity' support as the treatment group. Either way would allow the evaluator to compare outcomes across the two groups and estimate the impact which would then feed into the CBA. In any future project our recommendation would be to consider establishing the criteria for treatment/control before delivery and ensuring that as delivery begins recruitment to these groups is implemented carefully;
- Take up of multiple interventions: this follows from and is closely related to the previous point. The evaluation has found that many participants in Small Steps Big Changes have taken part in a number of the component projects. This makes it difficult to untangle the impact- which outcomes can be attributed to which component. This is one of the reasons why we were unable to estimate impact for the component projects of Small Steps Big Changes. In any future project, if a full CBA is required, our recommendation would be to establish which activities participants in treatment/control groups have access to is clear in advance and is adhered to throughout delivery;
- Cost data: data on costs is something that an evaluator is entirely reliant on the project owner for. The challenge here is for the project owner to be able to identify the additional costs over and above the financial costs (such as staff time, premises, etc) that are required to generate an estimate total economic costs. We were unable to obtain this data either for the individual components of the Small Steps Big Changes project or in aggregate. In any future project our recommendation is to identify the cost data required for a CBA and the means of data collection put in place before delivery begins;

- Implementation of project as described: there may be very good reasons for making changes to the delivery of a project as it progresses (in response to findings from formative evaluation for example or as a result of the impact of the COVID-19 pandemic during the last 18 months). Making changes can have an adverse impact on data collection (identified indicators of benefit may need to change for example) and on evaluation activity so, where possible, our recommendation is that in any future project these changes should be kept to a minimum; and
- Timescales: while it is possible that a CBA can be conducted at any stage of a project (for example as an ex ante appraisal exercise before a project begins), once the project begins it is better to wait until the end of the project. At this point the maximum amount of data (and documented benefit) is available to establish the impact of the project and form the basis for the CBA. In any future project our recommendation is to conduct the *analysis* required for a CBA at the end of the project.

Each of these had an impact on the data available to the wider evaluation project and to the CBA element of the wider evaluation. CBA is a data intensive exercise and while the wider evaluation will, nevertheless, be able to report a number of findings on the impact of the project and lessons learned from its implementation, in the end the attempt at CBA has only been able to report on the latter.

The ability to address these challenges to conducting a CBA do require resources and may be difficult as they would require these resources up front just at the time when project management activities associated with securing funding, entering into contractual agreements etc are at their most intense. This investment would pay off, in project management terms, as it would allow for a more robust evaluation, based on better quality of data, that would be substantially more informative than an exercise that tries to retrospectively create the required data. In turn, this could lead to better decision making concerning the allocation of resources.

Summary

This paper reports on the application of CBA to early life/preschool interventions. We noted some of the methodological challenges of applying CBA in this context and reviewed the findings from the literature. These findings informed our approach to the CBA, particularly in terms of identification of relevant costs and benefits to include. Unfortunately, we have been unable to complete a CBA for the Small Steps Big Changes project but in our attempts to do so have highlighted some lessons and recommendations that could be used to inform the design of future projects and associated evaluations. In the absence of results from a CBA of Small Steps Big Changes, the key message from the literature reviewed in this paper is that early life/preschool interventions generate substantial benefits that outweigh their costs.

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Appendix

Table 1: Benefits included in the various CBA studies of preschool interventions.

Intervention	Study	Benefits Included
HighScope Perry PreSchool project	Nores et al (2005)	Earnings Tax Contributions Reduced Crime Reduced Welfare Payments Childcare Reduced Education Costs
HighScope Perry PreSchool project	Belfield et al (2006)	Earnings Tax Contributions Reduced Crime Reduced Welfare Payments Childcare Reduced Special Education Needs
HighScope Perry PreSchool project	Temple & Reynolds (2007)	Childcare Child and Adult Education Savings Earnings Reduced Crime Reduced Welfare Payments

HighScope Perry PreSchool project	Heckman et al (2010b)	Child and Adult Education Savings Reduced Crime Earnings Reduced Welfare Payments
Carolina Abecedarian project	Barnett & Masse (2007)	Child Care Earnings Child and Adult Education Savings Reduced Crime Reduced Welfare Payments Health Benefits Maternal Earnings
Carolina Abecedarian project	Temple & Reynolds (2007)	Child Education Savings Earnings Health Benefits Reduced Welfare Payments Maternal Earnings
Carolina Abecedarian project	Elango et al (2015)	Child and Adult Education Savings Earnings Health Benefits Reduced Crime Reduced Welfare Payments
Carolina Abecedarian project	Garcia et al (2019)	Earnings Parental Earnings Reduced Welfare Payments Health Benefits Alternative Preschool Savings Reduced Crime Education Savings
Chicago Child Parent Centers	Reynolds et al (2002)	Reduced Remedial Education Costs Earnings Reduced Crime Reduced Welfare Payments Childcare
Chicago Child Parent Centers	Temple & Reynolds (2007)	Childcare Child Education Savings Child Welfare Savings Earnings Reduced Crime
Chicago Child Parent Centers	Reynolds et al (2011)	Reduced Remedial Education Costs Earnings Reduced Crime Child Welfare Savings Health Benefits
Head Start	Carneiro & Ginja (2014)	Health Benefits Reduced Crime
Head Start	Kline & Walters (2016)	Earnings Costs of Alternative Provision
Effective PreSchool Primary and Secondary Education project	Cattan et al (2014)	Earnings Savings to the Exchequer

Study of Early Education and Development project	Paull et al (2020)	Earnings
Evaluation of Children's Centres in England project	Gaheer & Paull (2016)	Reduced Costs of Truancy Reduced Special Educational Needs Costs Reduced Crime Reduced Smoking Reduced Depression and Mental Health Costs Earnings