

6 Effects of early childhood interventions



Assessing program outcomes

The available information on significant effects was examined to assess program outcomes. While non-significant trends may be part of a larger pattern, in and of themselves they cannot be interpreted reliably. Thus, only effects that were significant at .05 level were included. The use of the .05 cut-off is a commonly used cut-off in statistical analyses and was therefore adopted for consistency with scientific reports.

Long-running interventions have often been researched at different time points. Effect sizes are thus reported in terms of the timing of effects – whether the reported outcome effect was: short-term (data collected during or immediately after the intervention); intermediate (data collected up to two years after the intervention period); or long-term (data collected more than two years after the intervention period).⁵

For ease of reporting and interpretation, the magnitude of effects are grouped into four categories: negligible (Neg) (effect size under 0.20); small (Sm) (effect size 0.20-0.49); medium (Med) (effect size 0.50-0.79); or large (Lg) (effect size 0.80 or greater).

A negative effect size (-) indicates that effects were in the opposite direction to that which was expected. That is, the control group performed better on a measured outcome than the intervention group.

Tables 6-10 summarise the available data on intervention effect sizes. Missing cells indicate that effect sizes were either not calculated, or not reported in the evaluation material reviewed.⁶ The number of evaluation design elements present for each intervention is also included in these tables for reference.

Effects of cluster 1 interventions

The outcomes measured in the interventions in cluster 1 were all child outcomes and effect sizes were available for three of the six interventions in this cluster. Most of the effects were negligible to small, and very few effects were large. In addition, for the Perry project (that reported short, intermediate and long-term effect sizes), the positive effects on cognitive outcomes tended to diminish.

In terms of specific outcomes, the effects of intervention on child cognitive abilities varied, with the Perry project reporting large short-term gains and PIDI reporting negligible short-term gains. Similarly, children's academic gains reported by the Perry project were larger than those reported by CPC. (See Table 6.)

Effects of cluster 2 interventions

Effects sizes were available for child and family outcomes for three of the interventions in cluster 2. Again, most of the effects were negligible to small, with some effects diminishing over time and others remaining stable in the intermediate term.

⁵ This definition of long-term effects was adopted given the paucity of longitudinal follow-up in the early childhood intervention literature. However, our interests are really in effects that last throughout childhood and adolescence into adulthood.

⁶ Although a comprehensive search was undertaken, it is possible that some effect sizes are available that are not included in this report.

Table 6 Effects of cluster 1 interventions					
Intervention	Outcome	Effect size			Evaluation design
		Short-term	Intermediate	Long-term	
Perry	IQ	Lg	Sm	Neg	9/10 design elements were present in the Perry evaluation.
	Nonverbal intellectual performance	Med	Sm	Neg	
	Vocabulary	Lg	Sm	Neg	
	Psycholinguistic ability	Lg	Sm	Sm	
	Achievement tests		Sm	Med	
	Literacy	-	-	Sm	
	High school completion	-	-	Sm	
	Mean number of criminal arrests	-	-	Med	
	Monthly earnings	-	-	Med	
	Yearly earnings	-	-	Sm	
	Employment status	-	-	Sm	
	Welfare use	-	-	Sm	
	Teen pregnancy	-	-	Med	
Head Start	no data available				
CPC	Reading	-	Neg	Neg	9/10 design elements were present in the CPC evaluation.
	Mathematics	-	Neg	Sm	
	Teacher ratings	-	Neg	Neg	
	Grade repetition	-	Neg (-)	Neg (-)	
	Parent involvement in education	-	Sm	Neg	
	Special education	-	Sm (-)	Sm (-)	
	High school completion	-	-	-	
	Crime and delinquency	-	-	-	
High/Scope	no data available				
Saginaw	no data available				
PIDI	Cognitive development (under 3 years)	Neg	-	-	6/10 design elements were present in the PIDI evaluation.
	Cognitive development (3 to 5 years)	Sm to Med	-	-	
	Motor development (under 3 years)	Neg	-	-	
	Motor development (3 to 5 years)	Sm to Med	-	-	
	Health (under 3 years)	Med to Lg	-	-	
	Health (3 to 5 years)	Sm to Med	-	-	

In terms of specific outcomes, the effects on child cognitive and academic outcomes were quite varied between, and even within, interventions. The HIPPIY program found positive short and intermediate term effects on children’s cognitive skills and academic skills that ranged from negligible to medium, while the PCDC found mainly negligible long-term effects, although academic effects were medium for boys. (See Table 7.)

Effects of cluster 3 interventions

Only one of the three evaluations in intervention cluster 3 reported effect sizes. Both child and family outcomes were measured. Outcomes were measured in the intermediate term and most of the effect sizes were small. In terms of specific outcomes, the effects on child behaviour ranged from small to medium, while the effects on parent outcomes (including income, child care use and support) were small. (See Table 8.)

Effects of cluster 4 interventions

Evaluations in intervention cluster 4 measured child and family outcomes. Effect sizes were available for four of the twelve evaluations; most effect sizes were for short-term outcomes only. Again, most of the effect sizes were negligible to small.

Table 7 Effects of cluster 2 interventions					
Intervention	Outcome	Effect size			Evaluation design
		Short-term	Intermediate	Long-term	
PEIP	Home safety	Sm	Med	-	10 /10 design elements were present in the PEIP evaluation.
	Child hospitalisation	-	Sm	-	
	Home environment	Neg	Neg	-	
	Maternal education	Lg	-	-	
	Subsequent pregnancies	Neg	Neg	-	
	Child abuse and neglect	-	-	-	
	Maternal and child drug use	-	-	-	
	Maternal and child crime	-	-	-	
PCDC	Child - Cognitive	-	-	Neg (-) to Neg	7 /10 design elements were present in the PCDC evaluation.
	Child - School performance (males and females)	-	-	Neg	
	Child - School performance (males only)	-	-	Med	
	Child-Temperament (males and females)	-	-	Neg	
	Child-Temperament (males only)	-	-	Sm to Lg	
HIPPY	Cognitive skills	Neg to Med	-	-	7/10 design elements were present in the HIPPY evaluation.
	Reading	Neg to Sm	Neg to Med	-	
	Mathematics	Sm	Neg to Sm	-	
	Classroom Adaptation	Sm to Med	Neg to Med	-	
School readiness	Sm	-	-		
Healthy Start	no data available				
EEP	no data available				
SHELLS	no data available				
Baby HUGS	no data available				
Project 12-ways	no data available				

Table 8 Effects of cluster 3 interventions					
Intervention	Outcome	Effect size			Evaluation design
		Short-term	Intermediate	Long-term	
New Hope	Child - Social Skill (males only)	-	Sm	-	9/10 design elements were present in the New Hope evaluation.
	Child - Improved classroom behaviour (males only)	-	Sm to Med	-	
	Child - Lower externalising behaviour (males only)	-	Sm	-	
	Child - Lower internalising behaviour (males only)	-	Med	-	
	Child - Classroom behaviour (males only)	-	Sm	-	
	Child - Increased educational aspirations (males only)	-	Sm	-	
	Parent - Higher income	-	Sm	-	
	Parent - Higher child care use	-	Sm	-	
	Parent - Perceived social support	-	Sm	-	
FTP	no data available				
TPDP	no data available				

In terms of specific outcomes, the effects of interventions in cluster 4 on child cognitive outcomes were varied. Early Head Start found negligible effects, while BBBF found effects that ranged from negligible to medium, and IHDP found large effects. Effects on child emotional and behavioural outcomes were generally negligible, although Incredible Years and BBBF found some small to medium effects. Effects on parenting were contrasting, with Early Head Start reporting negligible

Table 9 Effects of cluster 4 interventions					
Intervention	Outcome	Effect size			Design
		Short-term	Intermediate	Long-term	
Early Head Start	Cognitive and language development	Neg	-	-	6/10 design elements were present in the Early Head Start evaluation.
	Social-emotional development	Neg to Sm	-	-	
	Parenting behaviour	Neg	-	-	
	Parent knowledge and discipline strategies	Neg	-	-	
	Parent health and family functioning	Neg	-	-	
	Parent self-sufficiency	Neg	-	-	
Abecedarian	no data available				
IHDP	IQ (heavier group)	Lg	-	-	9/10 design elements were present in the IHDP evaluation.
	IQ (lighter group)	Sm	-	-	
	Behaviour	Neg	-	-	
	Morbidity (heavier group)	Neg	-	-	
	Morbidity (lighter group)	Sm	-	-	
	Serious morbidity	Neg (-)	-	-	
	Functional Status	Neg	-	-	
	Height	Neg	-	-	
	Body mass (heavier group)	Neg	-	-	
	Body mass (lighter group)	Neg	-	-	
	General health	Neg	-	-	
Syracuse	no data available				
SESS	no data available				
Even Start	no data available				
CCDP	no data available				
Incredible Years	Child - Non-compliance	Neg	NS	-	9/10 design elements were present in the Incredible Years evaluation.
	Child - Conduct problems	Neg	NS	-	
	Parent - Harsh parenting	Neg	Neg	-	
	Parent - Positive interactions	Neg to Sm	Neg	-	
	Child - Non-compliance at home	Med	-	-	
	Child - Behaviour at school	Sm to Med	-	-	
	Child - Peer interactions	Sm	-	-	
	Parent - Parenting skills and interactions	Sm to Med	-	-	
ECEAP	no data available				
BBBF	Emotional and behavioural problems	Neg to Med	-	-	6/10 design elements were present in the BBBF evaluation.
	Language development	Neg to Med	-	-	
	Motor development	Sm to Med	-	-	
	Attention and Memory	Neg to Sm	-	-	
	Increase in breastfeeding	Sm (-) to Med (-)	-	-	
	Child nutrition	Neg to Med	-	-	
	Immunisation	Neg	-	-	
	Parent encouragement for bike helmet use	Lg (-)	-	-	
	Use of child professionals	Neg to Sm	-	-	
	Health pre and post natal	Sm (-) to Sm	-	-	
	Parenting	Med (-) to Lg	-	-	
	Reduced domestic violence	Sm	-	-	
	Sense of community cohesion	Med(-) to Med	-	-	
Sure Start	no data available				
NEWPIN	no data available				

effects, Incredible Years reporting small to medium effects and BBBF reporting effects that ranged from medium (but in the opposite direction) to large. (See Table 9.)

Effects of cluster 5 interventions

Triple P was the only evaluation in intervention cluster 5 that reported effect sizes. This evaluation found three large short-term effects on parent and child outcomes (child behaviour, parenting style and parent conflict over child rearing). Two of these large effects diminished at intermediate follow-up to small (child behaviour) and medium (parenting style). Effects on parent-child relationships were negligible, and small program effects were found on parent mental health, both of which were maintained at the same level at intermediate follow-up. (See Table 10.)

Summary of intervention effects

In summary, effect sizes indicated that child cognitive outcomes demonstrated the greatest change in the short-term; however, the size of these effects diminished over time. The more enduring effects were found on acts of delinquency and crime, with lower incidences of crime and delinquency among intervention participants. Most of the available effects on parent and family outcomes were negligible to small. However, it should be noted that few of the evaluations reporting effect sizes measured parent outcomes, and, in contrast to these findings, the Triple P program found large effects on parent outcomes.

Consistent with Benasich, Brooks-Gunn and Clewell (1992) and Brooks-Gunn (2003), who reported that most of the positive effects of interventions on child outcomes are the result of centre-based interventions, as opposed to home-visiting or case management interventions, the largest effects on child outcomes were found for intervention cluster 1 (where all programs were centre-based).

However, it is difficult to make any firm conclusions about the effects of the early intervention programs under review in this report, as many of the evaluations did not provide effect sizes, and the programs included in this review are not intended to be representative. In addition, it is acknowledged that the assignment of the terms “negligible”, “small”, “medium” and “large”, to the size of effects is following standard definitions, but does not equal actual impact or value, and can ignore the inherent worth of particular outcomes and their value to society (see reviews by Boyle and Hertzman in Russell 2002). A focus only on medium or large effect sizes might miss a valuable outcome with a small effect size, when that is all that is needed to “tip the balance” of health of a population (see Russell 2002).

Importantly, Brooks-Gunn (2003) notes that even a small effect size at a primary school aged follow-up is impressive, and an effect at adulthood even more so. The long-term follow-up of the Perry Preschool project reported here was conducted when participants were aged 27 years; approximately 22 years after participants had completed the intervention. To retain an effect, albeit negligible, for such a period of time is extremely impressive.

Intervention	Outcome	Effect size			Design
		Short-term	Intermediate	Long-term	
Triple P	Child behaviour	Lg	Sm	-	7/10 design elements were present in the Triple P evaluation.
	Parenting style	Lg	Med	-	
	Parent conflict over child rearing	Lg	Lg	-	
	Parent-child relationship	Neg	Neg	-	
	Parent mental health	Sm	Sm	-	
PAT	no data available				
Cuyahoga	no data available				