



preparing for life

Early Childhood Intervention

Summary Report

Preparing for Life at Age 9: Assessing the Continuity or Fade-out of Effects



UCD Geary Institute
for Public Policy



Preparing for Life

working together for our children



preparing for life

What is the PFL programme?

Preparing for Life (PFL) is a prevention and early intervention programme designed to promote children's school readiness by working with families from pregnancy until their children start school. Results from an extensive randomised controlled trial evaluation showed that the programme was effective at improving the children's school readiness when they were 5 years old. This follow-up study examines whether the impacts of the programme are sustained now that the children are about 9 years old.

Why was the PFL programme developed?





PFL was developed as evidence showed that over half of the children living in the area were starting school without the necessary skills to make a successful transition to school life. The *PFL* programme aimed to promote children's development and improve these low levels of school readiness by supporting parents to develop the skills and knowledge to help prepare their children for school.

How did the PFL programme and evaluation work?

From 2008 to 2015, the evaluation team from the UCD Geary Institute for Public Policy followed the journey of 233 families who agreed to participate in the randomised controlled trial (RCT). When the families consented to join *PFL* during pregnancy they were randomly assigned to either a high treatment group or a low treatment group. Using the RCT design ensured there were few differences between the types of families in each group before the programme began. This meant that if the outcomes of the two groups were different over the course of the evaluation, we could be confident that the findings were caused by the *PFL* programme.

By following children from birth through to school entry, the evaluation examined the impact of *PFL* on children's cognitive development, language development, approaches to learning, socio-emotional development, and physical wellbeing & motor development. Information was gathered at multiple time points from parents, children, hospitals, schools, and teachers using questionnaires, observations, direct assessments, medical records, and interviews. The evaluation found that *PFL* was effective at improving children's school readiness across all these domains, particularly in terms of children's cognitive development and physical wellbeing & motor skills. The programme also had some impacts on parenting and the quality of the home environment; however, these impacts were smaller and less consistent. Now that the children are older and progressing through school, the Age 9 Follow Up study examines whether the impact of *PFL* has been sustained.

Key Results at Age 4/5

Cognitive Development	Better cognitive functioning, spatial abilities, non-verbal reasoning skills, and basic numeracy skills		e.g. 10 point IQ gap between children in the high and low treatment groups
Socio-emotional Development	Reduction in hyperactivity and inattentive behaviours		e.g. 2% of the high treatment group at risk of behavioural problems compared to 17% of the low treatment group
Health	Improved diet, used fewer hospital services, less likely to be overweight		e.g. 24% of the high treatment group classified as overweight compared to 41% of the low treatment group
Parenting	Better parenting practices and screen time supervision		e.g. high treatment parents less likely to engage in punitive and hostile parenting

What did the families receive?

HIGH TREATMENT SUPPORTS

MENTORING

Through regular home visits, the *PFL* mentors built good relationships with parents and provided them with high quality information about parenting and child development using Tip Sheets. The home visits started in pregnancy (at ~21 weeks) and continued until the child started school (at age 4 or 5).

TRIPLE P

The Triple P Positive Parenting Programme aimed to improve positive parenting through the use of videos, vignettes, role play, and Tip Sheets in a group-based setting. Parents participated in Triple P training when their children were between 2 and 3 years of age.

BABY MASSAGE

Baby massage classes were offered during the first year to equip parents with skills which would allow them to interact with, stimulate, relieve, and relax their baby, and to emphasise the importance of communication between parents and babies.

PFL PARTICIPANTS



HIGH TREATMENT (GREEN)

1. €100 worth of child developmental toys annually and book packs
2. Facilitated access to enhanced pre-school
3. Public health workshops
4. Facilitated access to local services
5. Access to social events
6. Mentoring
7. Triple P
8. Baby massage

N = 115

LOW TREATMENT (BLUE)

1. €100 worth of child developmental toys annually and book packs
2. Facilitated access to enhanced pre-school
3. Public health workshops
4. Facilitated access to local services
5. Access to social events

N = 118

How was the programme delivered?

How much support did high treatment families receive?

ENGAGEMENT



Home Visits

Families received on average **51 hours** of home visits

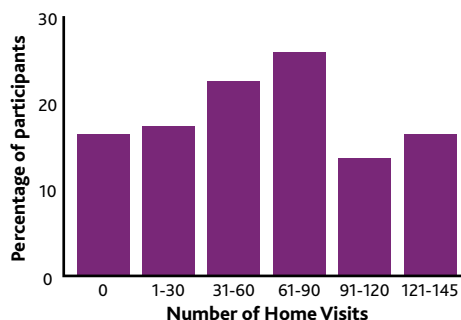
Visits lasted **49 minutes** on average

The number of visits ranged from **0 to 145**

Families received on average **50 visits**

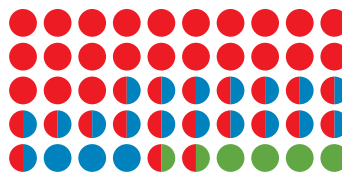
96 families had at least one home visit

Older mothers with higher cognitive resources who were employed during pregnancy and had better knowledge of child development during pregnancy **engaged** in more home visits



Parenting Skills Training

50 families engaged in Triple P training



● Group Triple P ● Discussion ● Primary Care Triple P

Baby Massage



62%

of families attended baby massage classes

CONTAMINATION

Did the low treatment group receive the high treatment supports?

The potential for contamination was high in *PFL* as it took place in a small community where families in the high and low treatment groups may have known each other. However, our measures of contamination found that the low treatment families did not benefit from the supports offered to the high treatment families.

How was the Age 9 Follow Up study conducted?

At the Age 9 Follow Up, the *PFL* children ranged in age between 7 and 11 years, with an average age of 9 years old. Families were invited to take part through one of two methods:

Community Event Recruitment

- *PFL* reunion event open to all *PFL* families (high & low)
- UCD researcher in attendance to discuss study and recruit interested families

Targeted Recruitment

- Requested permission to contact families for future research at the end of the age 5 study ($N_{\text{high}}=74$; $N_{\text{low}}=73$)
- Families contacted directly if they did not attend the community event

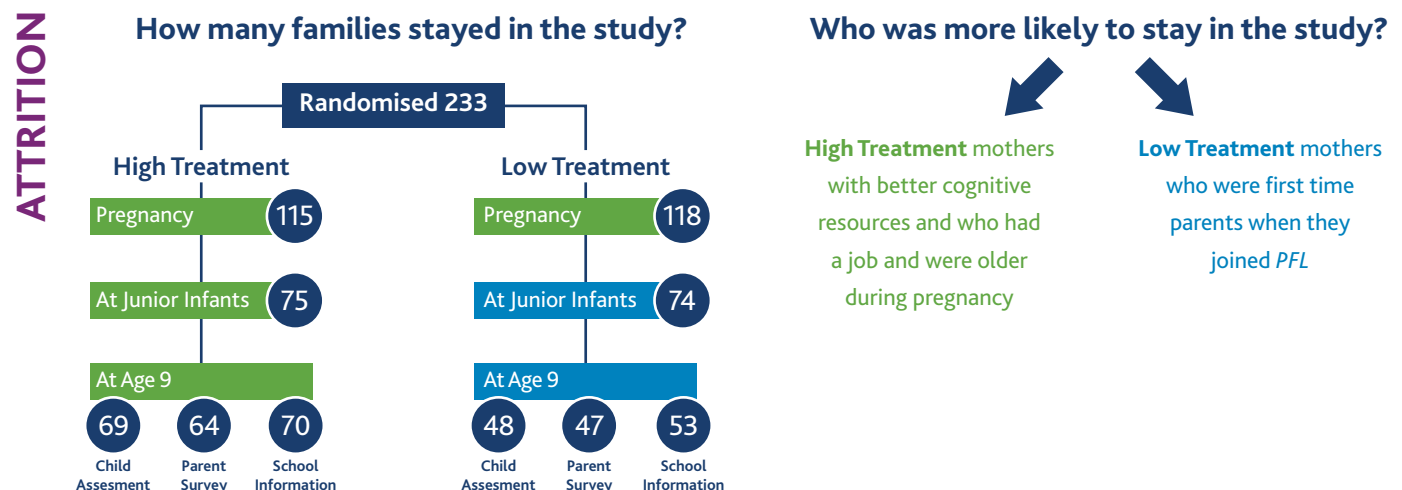
What data were collected in the Age 9 Follow Up study?

For participants who agreed to take part in the Age 9 Follow Up study, three types of data were collected: direct assessments of children, interviews with parents, and data from schools.

Child	Parent	School
Direct Assessment	Online/Phone/In Person	Administrative Records
Cognitive Development British Ability Scale III NIH Toolkit Executive Functioning	Parenting Family Involvement Questionnaire Attentional Control Scale Internet usage/supervision	Academic Standardised Tests 2 nd & 3 rd Class Reading scores 2 nd & 3 rd Class Mathematics scores
Socio-emotional Development Social Skills Improvement System	Socio-emotional Development Brief Problems Monitor Strengths & Difficulties Questionnaire	Absenteeism & School Resources % days absent from school Special education needs & supports
Child Health Height & weight – BMI Heart rate Blood pressure	Child Health Health status Health service use Dietary intake	

Who took part in the Age 9 Follow Up study?

Over 50% of children took part in the direct assessments (high treatment = 59%; low treatment = 41%), while 48% of parents were interviewed (high treatment = 56%; low treatment = 40%) and school data were collected for 53% of children (high treatment = 61%; low treatment= 45%). A comparison of the baseline characteristics of the high and low treatment groups found that the groups were still balanced at age 9.



How were the Age 9 Follow Up data analysed?



All the results were estimated using permutation tests with 100,000 replications, with adjustments for attrition using inverse probability weights and for multiple hypotheses testing using the stepdown procedure. The results are discussed using p-values to indicate statistically significant effects, where $p < 0.1$ is considered statistically significant, and Cohen's d effect sizes, where a small effect is 0.2, a medium effect is 0.5, and a large effect is 0.8.

Were the impacts of *PFL* sustained at Age 9?

Cognitive Development

At age 9, the *PFL* programme had a significant and large impact on children's cognitive development. Children who received the high treatment supports had better general cognitive functioning, spatial abilities, non-verbal reasoning skills, and verbal abilities. The programme increased children's overall cognitive functioning by 0.67 of a standard deviation, which is similar to the effect size of 0.72 found at age 4/5. *PFL* also had a significant and positive impact on children's executive functions in terms of improving their inhibitory control, attention flexibility, and working memory.

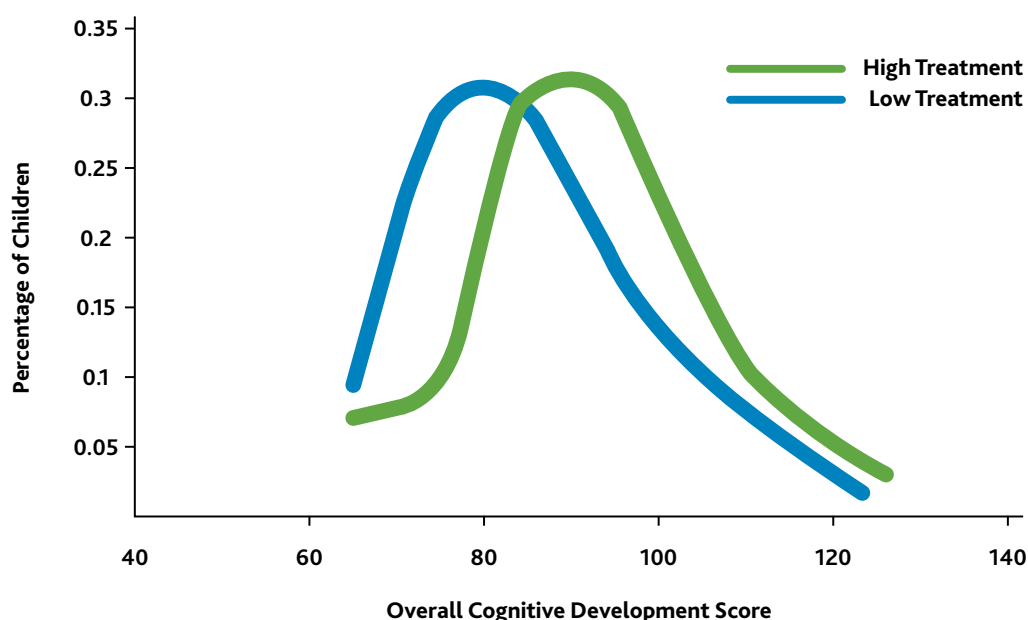
Cognitive Outcomes: British Ability Scales & NIH Executive Functioning

	N (High/Low)	M _{High} (SD)	M _{Low} (SD)	p-value	Effect Size
British Ability Scale Composite Scores					
General Conceptual Ability	116 (69/47)	88.12 (11.85)	80.13 (12.11)	0.002	0.67
Spatial Ability	117 (69/48)	94.09 (14.26)	86.75 (16.27)	0.032	0.48
Non-Verbal Ability	117 (69/48)	84.63 (11.67)	76.53 (9.70)	0.000	0.76
Verbal Ability	116 (69/47)	92.22 (11.70)	87.27 (13.67)	0.043	0.39
NIH Toolbox Executive Functioning					
Flanker Task - Inhibitory Control	116 (69/47)	98.01 (16.64)	89.51 (11.39)	0.046	0.61
Dimensional Change Card Sort Task - Attention Flexibility	115 (69/44)	102.33 (21.68)	91.07 (12.45)	0.035	0.66
List Sorting Task - Working Memory	113 (69/44)	96.27 (13.43)	89.83 (9.48)	0.008	0.56

Note: N_{High/Low} is the number of children in the high and low treatment groups. M_{High} is the average score of the high treatment group and M_{Low} is the average score of the low treatment group. A p-value less than 0.100 means that the difference between the high and low treatment groups is statistically significant. The effect size is a measure of how large the difference between the high and low treatment group is in terms of standard deviations.

The figure below shows that the distribution of cognitive development scores for the high treatment group is shifted to the right of the low treatment group's distribution, with larger differences at the lower tail. This demonstrates that *PFL* raised the ability of poorer performing children.

Distribution of Overall Cognitive Development Scores



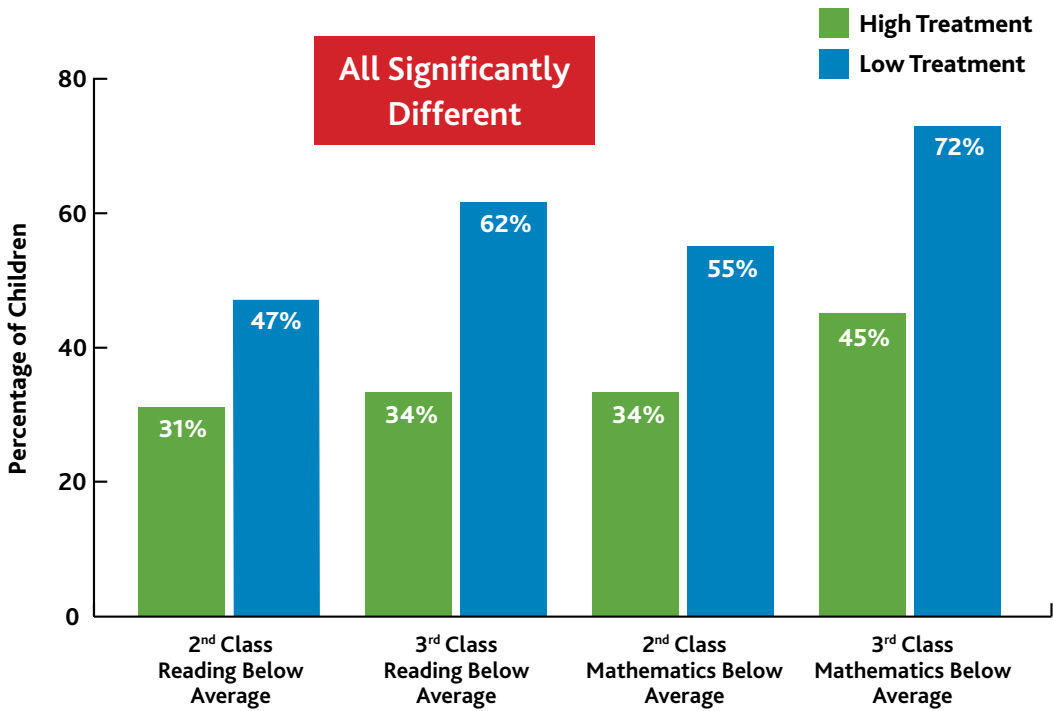
**Significantly
Different**

Overall, these results show that the large effects on cognitive development found at the end of the programme have been sustained at age 9.

School & Academic Outcomes

At age 9, the *PFL* programme had a significant and large impact on children’s academic outcomes. Children who received the high treatment supports had better 2nd and 3rd class standardised test scores in reading and maths, with effect sizes ranging from 0.33-0.74 of a standard deviation. The high treatment group were significantly less likely to score below average on their 2nd and 3rd class reading and maths tests and more likely to score above average on their 3rd class reading and 2nd class maths tests. These results illustrate that improving children’s school readiness skills can have a lasting impact on their school performance. However, *PFL* did not have an impact children’s school attendance or their receipt of special educational supports such as having a Special Needs Assistant.

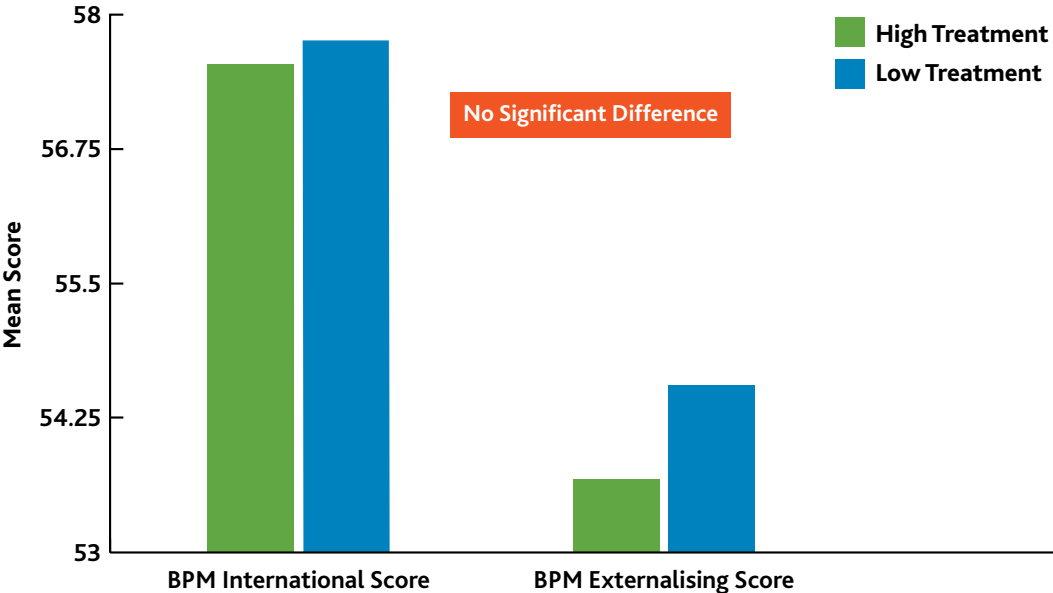
Academic Outcome: % Scoring Below Average in Reading & Maths Tests



Socio-emotional Development

At age 9, the *PFL* programme had no impact on children’s socio-emotional development based on both parent and child reports. Although the high treatment group reported somewhat better socio-emotional and behavioural outcomes than the low treatment group, none of the differences were statistically significant. Therefore the effects on children’s externalising (e.g. tantrums) and internalising (e.g. worrying) behaviour found at the end of the programme were not sustained at age 9.

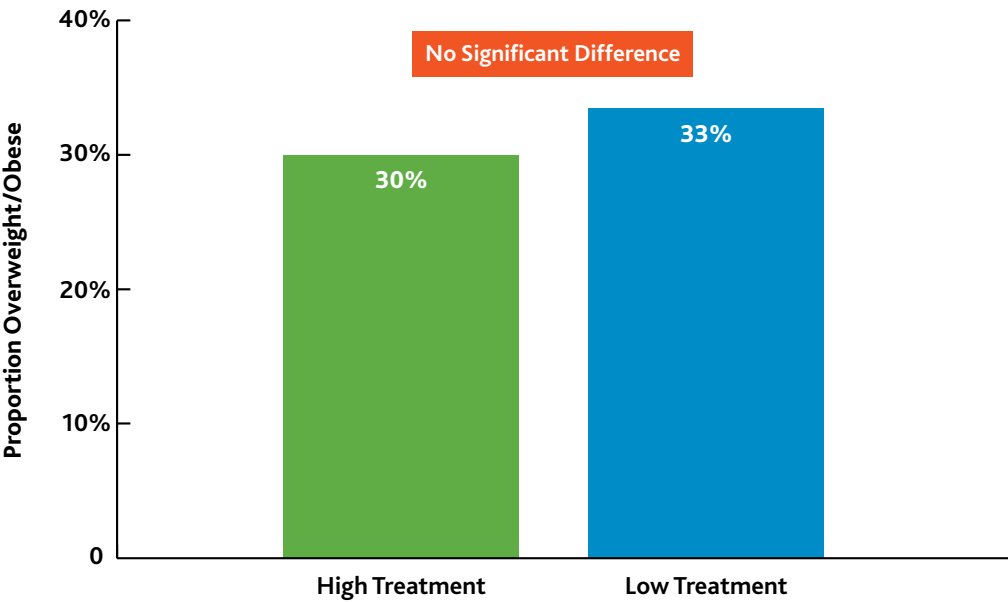
Socio-emotional Outcome: Scores on the Brief Problems Monitor Scale



Health

At age 9, the *PFL* programme had no impact on children’s health outcomes as measured by self-reported health, health service use, dietary intake, heart rate, blood pressure, and BMI. By age 9 approximately 30% of high treatment children and 33% of low treatment children were categorised as overweight or obese. By comparison, a lower proportion of high treatment children (26%) and a larger proportion of low treatment children (41%) were categorised as overweight or obese at age 4. Therefore the effects on children’s health at the end of the programme were not sustained at age 9.

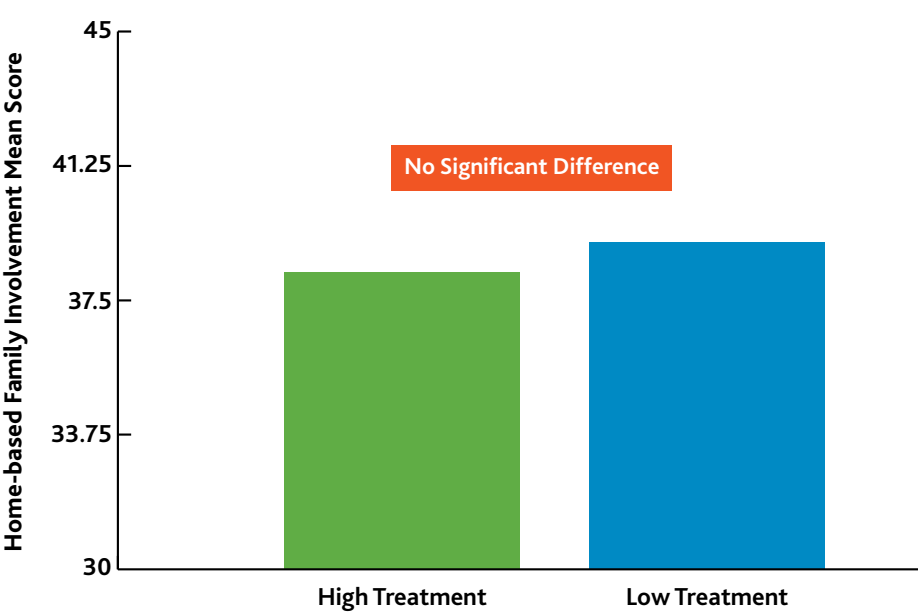
Health Outcome: % Scoring Overweight/Obese



Parenting

At age 9, the *PFL* programme had no impact on parenting outcomes as measured by the Family Involvement Questionnaire assessing parental involvement in their children’s education, the Attentional Control Scale assessing differences in parent’s ability to control their attention, or media usage strategies assessing parental supervision of child internet use. These results somewhat align with the limited differences observed on parenting throughout the programme.

Parenting Outcome: Family Involvement Questionnaire Total Score





Concluding Remarks

The aim of the Age 9 Follow Up study was to examine whether the large and significant impacts of *PFL* found at the end of the programme were sustained at age 9. Prior evidence on the medium-term impact of home visiting and parent-training programmes in middle childhood is inconclusive, with many studies experiencing a dissolution of effects once the programme ends. By contrast, this study finds that *PFL* continues to have a sizeable effect on children's cognitive skills and achievement tests approximately 5 years after the families finished the programme. In particular, there is no evidence of cognitive fade-out, with effect sizes of 0.67 of a standard deviation on overall cognitive ability, and significant effects on executive functioning and standardised school achievement tests. The magnitude of the effects are similar to those found at the end of the programme and substantially larger than those found in much of the existing literature. This may be attributed to the specific features of *PFL* including its prenatal start, its longer programme duration, and its multiple connected treatments.

In contrast, *PFL* has no impact on absenteeism or the use of school resources, and the significant effects observed for children's socio-emotional development at age 4 are no longer present at age 9. Additionally, in-line with studies of other home visiting programmes, there is little evidence that the programme continues to have an impact on children's health or parenting behaviour. The fade-out of *PFL*'s effects in these domains may be driven by the smaller number of significant impacts and lower effect sizes found at earlier time points. As the *PFL* children are now spending a greater proportion of their day outside the home environment, it is possible that specific supports targeting the school environment are required to bolster children's development in these areas. In addition, although the programme has improved children's cognitive development, a sizeable proportion of children in the high treatment group are still scoring below the norm in terms of their development. This supports the theory that continued investment is required to break long-standing socio-economic inequalities in children's skills.

Yet the children who received the *PFL* programme are still performing significantly better than the children who did not in terms of their cognitive development and school performance, and these sizable cognitive advantages are likely to have positive impacts on their success and progression from primary to secondary school, as well as their future life outcomes.

This story presents the journey of a typical *PFL* child at age 9 based on the data collected

Kirsty is now 9 years old and she is happily progressing through school. She gets on well with her peers, is physically healthy and misses very few days of school. From taking part in *PFL*, Kirsty is good at thinking logically, as well as making decisions and learning. Compared to her classmates, she is better at concentrating, reasoning, and problem solving, which makes school easier for her. This year Kirsty did well in her standardised tests in reading and maths at school. She is average at reading but she is better at maths. Kirsty's mam lets her access the internet but she is usually supervised and Kirsty has to follow rules about what she is allowed to watch and when. Kirsty eats lots of different types of food but finds it hard to eat enough fruit and vegetables. She sleeps really well and usually gets about 10 hours of sleep a night, so she feels ready for her next school day.

A more detailed report of the *PFL* evaluation can be found at the following website under publications:

<http://geary.ucd.ie/preparingforlife>