preparing for life

Early Childhood Intervention

Final Report: Did *Preparing for Life* Improve Children's School Readiness?

UCD Geary Institute for Public Policy

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Early Childhood Intervention
Final Report

Did *Preparing for Life* Improve Children's School Readiness?

EVALUATION OF THE *'Preparing For Life'*
EARLY CHILDHOOD INTERVENTION PROGRAMME

By
PFL EVALUATION TEAM at the UCD GEARY INSTITUTE FOR PUBLIC POLICY
August, 2016

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Acknowledgements

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Emma Byrne-MacNamee, Manager, *Preparing For Life*

Executive Summary

What is the *PFL* programme?

Preparing for Life (*PFL*) is one of the most extensive randomised control trials of an early childhood intervention conducted in Europe. At its heart, the *PFL* programme seeks to provide families with a helping hand in getting their children ready for one of the most important transitions of their life – starting school. *PFL* has shared the lives of over 200 families in an area of Dublin, Ireland, from pregnancy through to when the children started school. As their journey together has now drawn to a close, this report answers the critical question - *"Did the PFL programme improve the lives of these children?"*

Why was the programme developed?

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

What is school readiness?

The *PFL* programme considers 'school readiness' as children's skills across five areas:

Figure ES.1 - *Five Domains of School Readiness*

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 families who agreed to participate in the randomised control 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 the high treatment group and the types of families in the low treatment 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 improved outcomes were caused by the *PFL* programme. Figure ES.2 describes the different supports provided to the two groups.

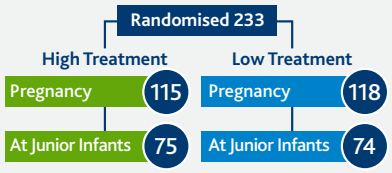
Figure ES.2 - *Supports Offered by the PFL Programme*

During the course of the study, families took part in research visits involving questionnaires, observations, and direct assessments when their children reached 6, 12, 18, 24, 36, and 48 months of age. Families also gave consent for the evaluation team to access their maternity hospital records from the Rotunda Hospital and the National Maternity Hospital Holles Street, and their children's hospital records from Temple Street Children's University Hospital. In Junior Infants, teachers completed online surveys about the children's school readiness, and the researchers conducted interviews with the children on their experiences of school life. This report summarises these findings.

How was the *PFL* programme delivered?

ATTRITION

How many families stayed in the study?



Who was more likely to stay in the study?

High Treatment mothers with better cognitive resources and who had a job during pregnancy

Low Treatment mothers who were older, who already had children, and who had better knowledge of child development when they joined *PFL*

ENGAGEMENT

How much support did high treatment families receive?

Home Visits

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

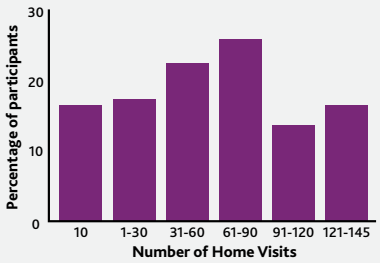
Visits lasted **49 minutes** on average

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

Families received on average **50** visits

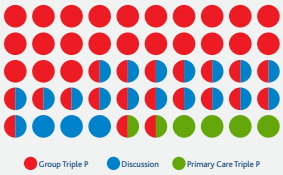
96 families had at least one home visit

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



Baby Massage

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.

Figure ES.3 - *Delivery of the PFL Programme*

Did the *PFL* programme work?

Did *PFL* improve children's cognitive development…

During the programme?

The *PFL* programme improved children's cognitive development from 18 months of age onwards. Children who received the high treatment supports had better general cognitive functioning and more of them scored above average from 24 months onwards.

> ***"I've got 1, 2, 3, 4, 5 …I keep learning"*** *PFL* Child in Junior Infants

At school entry?

By school entry, 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 basic numeracy skills. This means that they were better at understanding information, seeing patterns, solving problems, and working with numbers.

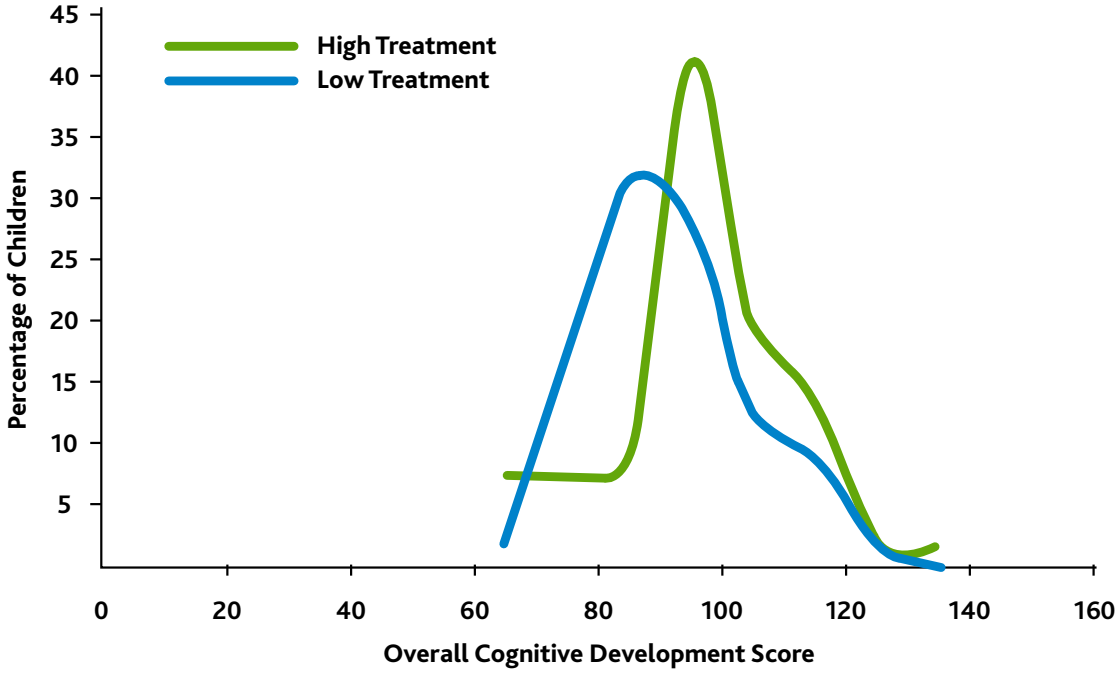


Figure ES.4 - *Distribution of Cognitive Scores in Both Treatment Groups*

Did *PFL* improve children's language development…

During the programme?

The *PFL* programme made limited improvements to children's language development up to 48 months. Children who received the high treatment supports had better emergent literacy skills at 24 months and better communication skills at 36 months. The programme did not improve children's expressive or receptive language skills during the programme.

> ***"What's easy about school?" "Ahm, my letters and I could read on my own now."***
>
> ***"What's hard about school?" "Ahhh, tricky words..They are words that are tricky, but they don't trick us."***
>
> *PFL* Child in Junior Infants

At school entry?

By school entry, the *PFL* programme had a significant and large impact on children's overall verbal ability, their expressive and receptive language skills, and their communication and emerging literacy skills. This means that the children who received the high treatment supports were better able to use and understand language and had better skills for reading and writing. The programme did not improve children's basic or advanced literacy skills.

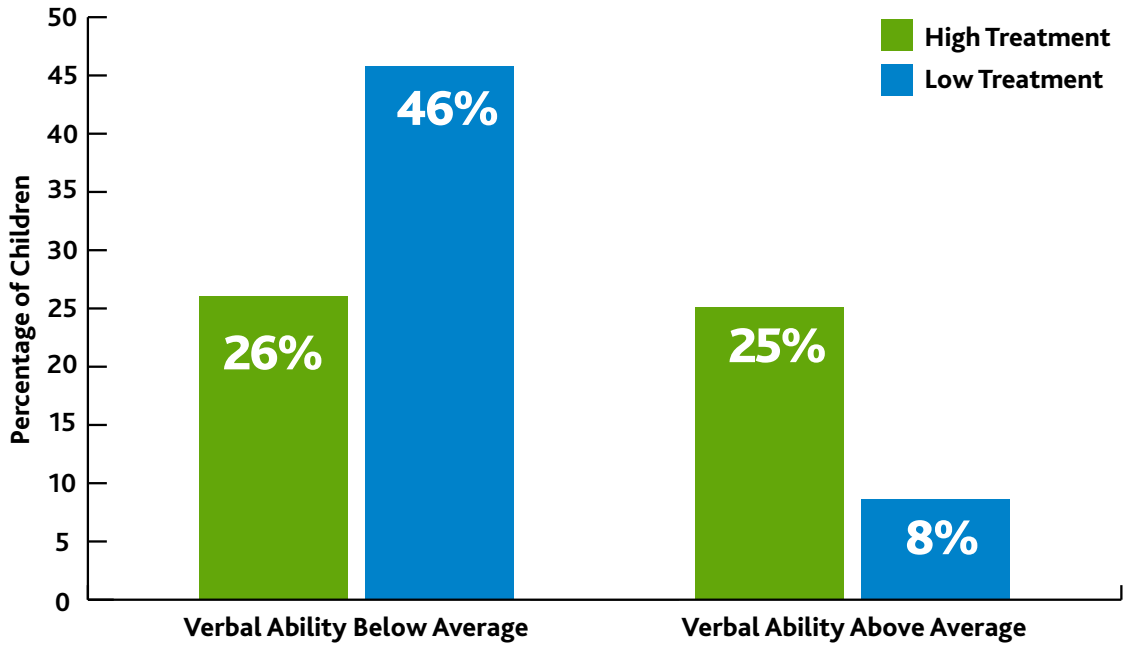


Figure ES.5 - *Percentage of Children Scoring Above and Below Average in Verbal Ability*

Did *PFL* improve children's approaches to learning…

During the programme?

The *PFL* programme improved children's approaches to learning from 36 months onwards. This means that the children who received the high treatment supports were more likely to explore their world and learn with toys.

> ***"What will Riley the rabbit like about school?" "He'll like to work…Because you get to colour in…You learn and you get to colour and play and you get to go out into the yard….I like colouring and I like going out to the yard…"***
>
> *PFL* Child in Junior Infants

At school entry?

By school entry, the *PFL* programme had some impact on how children approached learning. Children who received the high treatment supports were better able to manage their attention, yet the programme did not change their general approaches to learning, interest in school subjects, keenness to explore new things, or their ability to control impulsive behaviour.

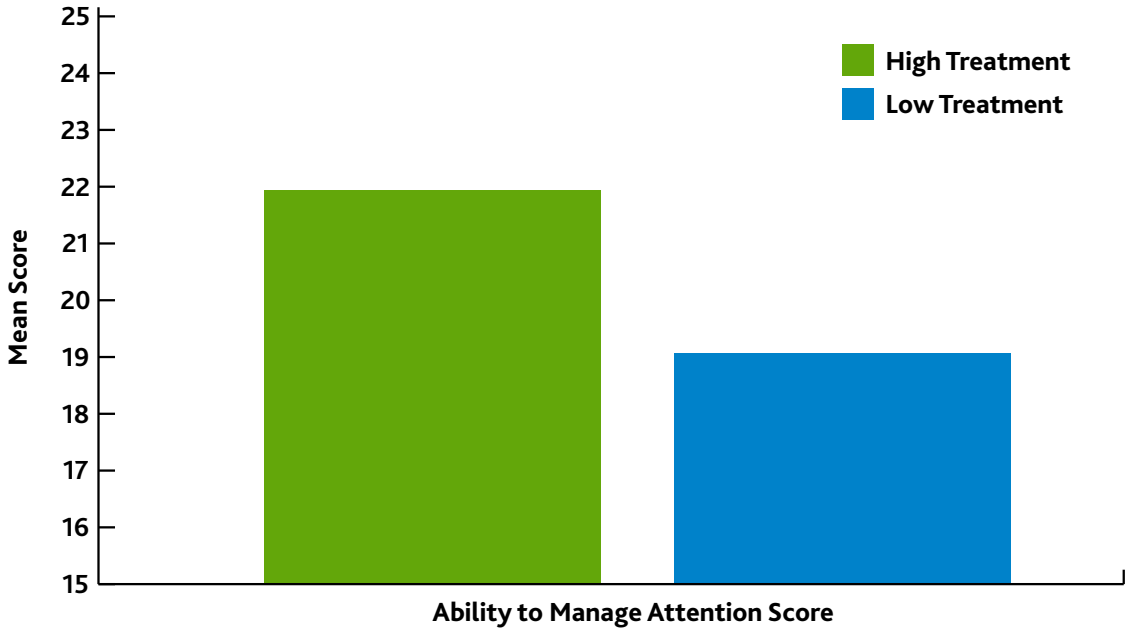


Figure ES.6 - *Mean Scores of Children on Ability to Manage Attention Task*

Did *PFL* improve children's social and emotional development…

During the programme?

The *PFL* programme reduced children's internalising and externalising behaviour problems from 24 months onwards. This means that the children who received the high treatment supports were less likely to feel negative emotions such as sadness or act out in negative ways like throwing tantrums. From 36 months onwards, the programme improved children's positive prosocial behaviours such as sharing with others.

> ***"What will Riley the rabbit need to know about school?" "She will have to know to say hi in the yard….Maybe she will make some friends out in the yard I guess…. Yes I really think so."***
>
> *PFL* Child in Junior Infants

At school entry?

By school entry, the *PFL* programme had a significant impact on reducing children's hyperactivity and inattentive behaviours and improving their social competencies and autonomy. This means that the children who received the high treatment supports were less likely to be distractible in the classroom, got on better with their classmates, and had the skills needed to be independent in the school day. The programme had no impact on children's aggression, oppositional-defiance, anxious behaviour, or on their prosocial, respectful behaviours according to the teacher reports.

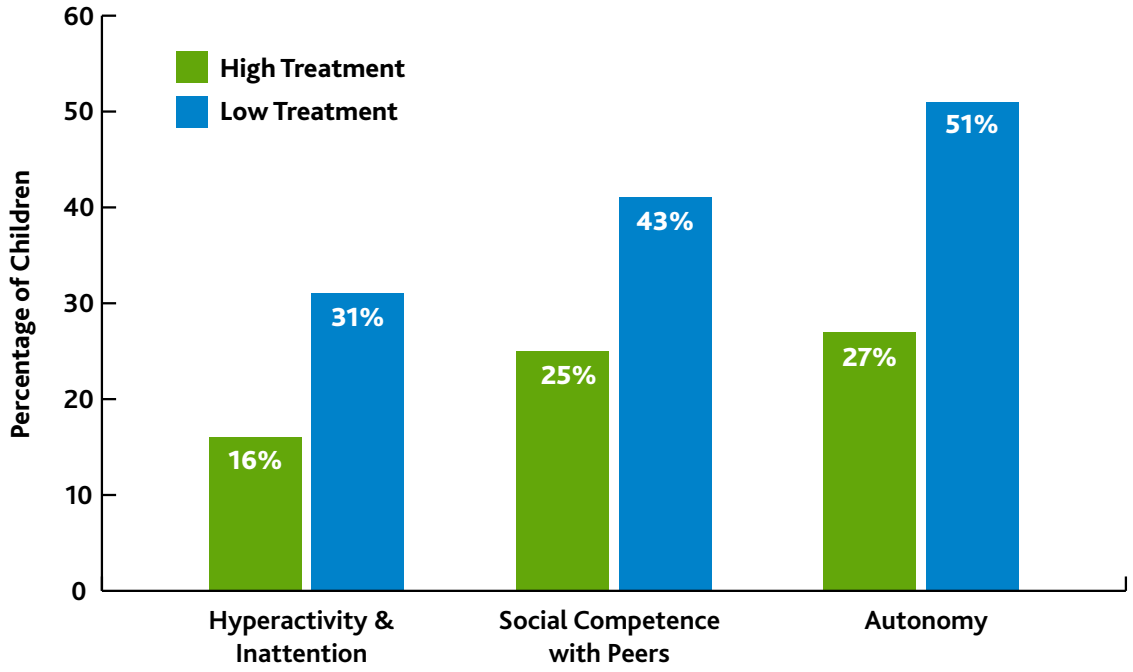


Figure ES.7 - *Percentage of Children 'Not on Track' on Measures of Social and Emotional Development*

Did *PFL* improve children's physical wellbeing and motor development…

During the programme?

The *PFL* programme had an impact on the children's physical wellbeing and motor development from birth onwards. Children who received the high treatment supports were more likely to be born naturally, to be immunised, were healthier, had better diets and motor skills, were less likely to be overweight, and more likely to be toilet trained.

> ***"I eat healthy stuff, I eat my nanny's apples, I eat nanny's bananas…And I eat carrots and grapes. I don't even eat peppers, they are too hot***
>
> *PFL* Child in Junior Infants

At school entry?

The programme had a significant impact on reducing the amount of hospital services the children used and improved how families used these services. There was a limited impact on the diagnoses children received in hospital, but children who received the high treatment supports were less likely to have to visit the hospital for urgent reasons, and were less likely to experience fractures. They were also less likely to have visited the Orthopaedics, Physiotherapy, Paediatrics, Occular, and Plastic Surgery Outpatient departments.

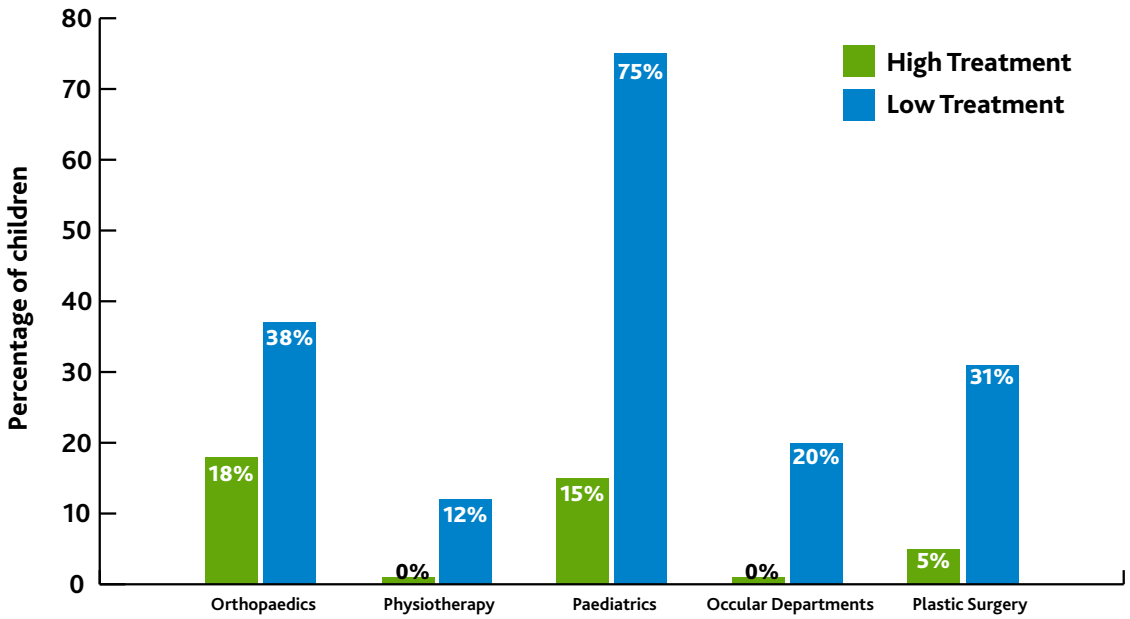


Figure ES.8 - *Percentage of Outpatient Children who ever visited Outpatient Departments*

By school entry, the *PFL* programme had a significant impact on children's gross and fine motor skills and their physical independence. The programme had no impact on children's physical readiness for the school day.

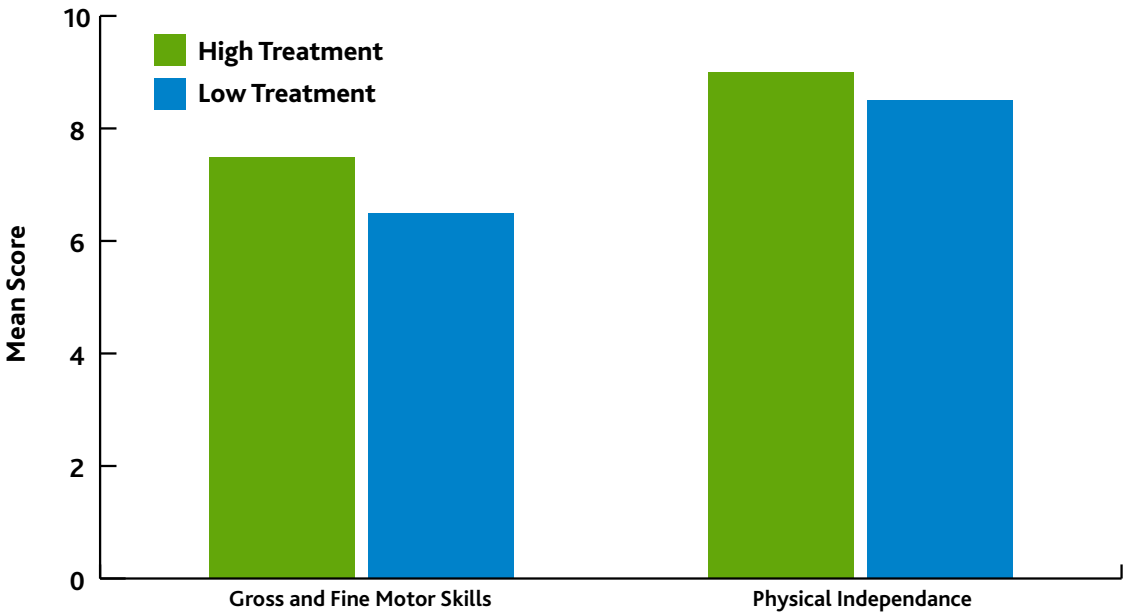


Figure ES.9 - *Mean Scores of Children on Physical Wellbeing and Motor Development at School Entry*

Key Results

Overall, *PFL* achieved its aim of improving children's school readiness. The programme had a positive and significant impact on each of the five domains as summarised below:

	Impacts during the programme	Impacts at School Entry
Cognitive Development	Cognitive improvements from 18 months onwards	10 point IQ gap between children in the high and low treatment groups
Language Development	High treatment children were better at combining words at 24 months	25% of high treatment children had above average verbal ability compared to 8% of low treatment children
Approaches to Learning	High treatment children showed better approaches to learning from 36 months	High treatment children were better able to control their attention than low treatment children
Social & Emotional Development	2% of high treatment children were at risk of behavioural problems compared to 17% of low treatment children at 48 months	25% of high treatment children 'not on track' in their social competence compared to 43% of low treatment children
Physical Wellbeing & Motor Development	24% of high treatment children were classified as overweight compared to 41% of low treatment children at 48 months	High treatment children had better gross and fine motor skills

Figure ES.10 - *Key Results from the PFL Evaluation*

Concluding Remarks

This report has drawn together a wealth of information from parents, teachers, children, and administrative records to consider the overall impact of the *PFL* programme on children from birth until school entry. Based on the weight of evidence it is clear that *PFL* improved the lives of the participating children, and ultimately achieved its aim of getting children ready for school. By implementing thorough checks and procedures throughout the evaluation, and subjecting the data to rigorous testing, we are confident that these findings are robust. It remains to be seen whether the success of the *PFL* programme at school entry will persist into the children's later lives, but for now, thanks to the efforts of the *PFL* parents and the programme staff, we know that the *PFL* children have started school with the foundations set to reach their full potential.

Implications

The findings from the *PFL* evaluation has implications for policy, practice, and research. Below we summarise some of these key implications.

IMPLICATIONS FOR POLICY

- *PFL* makes an important contribution to the international evidence-base by demonstrating that intensive family support from pregnancy onwards is key to improving the outcomes of disadvantaged children.
- *PFL* impacted on multiple dimensions of children's lives, thus demonstrating its capacity to contribute to the five national outcomes outlined in the Better Outcomes, Brighter Futures national policy framework for children and young people (Government of Ireland, 2014).
- *PFL* is closely aligned to the Better Outcomes, Brighter Futures commitment to prioritise supports for parents, prevention and early intervention, and investment in programmes that have strong evidence of effectiveness.

IMPLICATIONS FOR PRACTICE

- Given the higher levels of drop-out during the first six months of programme implementation, particular attention should be paid to engaging and retaining families during pregnancy and around the birth of the child.
- *PFL* was successful in attracting families most in need of intervention. If the programme is rolled out in communities with different characteristics the eligibility criteria for programme entry should be revisited.
- There was considerable variability in the number of home visits the families received. While working within the boundaries of the *PFL* manual, the programme should continue to be flexible to families' needs regarding the timing, location, and focus of the home visits.

IMPLICATIONS FOR RESEARCH

- A follow-up study of the *PFL* participants would inform evidence regarding the medium and long-term impact of the programme, while generating evidence on the persistence or fade-out of the effects at school entry.
- Continuation of the Children's Profile at School Entry study, which has tracked the school readiness skills of all children in the *PFL* communities since 2008, may provide important information on the wider impact of the programme in the long term.
- If the *PFL* programme is rolled-out in communities with different characteristics, it would be prudent to conduct a replication study to test whether the gains made in the *PFL* community can be replicated among different populations.

This story presents the journey of a typical *PFL* mother based on the data collected

Kirsty's mam joined the *PFL* programme when she was 21 weeks pregnant. She wasn't sure about joining the programme at first, but after chatting to her mentor she felt comfortable about taking part. While she was a little shy at the start, once she got to know her mentor, she started to look forward to her visits which usually happened about once a month. After Kirsty was born, Kirsty's mam followed the Tip Sheets her mentor had discussed with her and took steps to make their house safer by putting covers on electrical sockets and using safety gates. When Kirsty was a few months old, her mam took her to the *PFL* offices to get a professional photo taken. She loved getting the framed picture of Kirsty and enjoyed talking to the other new mams in the area.

Kirsty's mam found that looking after a 6 month old baby was challenging, but by using some tips from her mentor, such as going for a walk with Kirsty to stop her crying and giving her a massage to help her sleep, she was able to deal with these stressful situations. Kirsty's mam and her older sister enjoyed playing with Kirsty on the play mat from the *PFL* developmental pack. While Kirsty's mam would never have considered buying one herself, she found the mat very useful. Using books from *PFL*, she would sit Kirsty on her knee, and read to her while pointing at and naming the colourful pictures.

When Kirsty was 12 months old, her mam supervised happily as Kirsty started to walk and explore. At 18 months, Kirsty's mam would spend time with her by singing songs, dancing, and telling her stories. Even though Kirsty's mam smoked, she never smoked inside their house. At about this time, Kirsty's mam was concerned about her language and after talking to her mentor, she visited the GP to discuss getting some extra help for Kirsty. When she was a toddler, Kirsty would sometimes bite or hit other children. While this was worrying for Kirsty's mam at first, from talking to her mentor she realised that Kirsty was just learning the limits of how to behave, so instead of shouting at her, she would stay calm and talk to Kirsty about why she shouldn't hurt others.

When Kirsty was 2 years old, her mam found it frustrating when Kirsty wouldn't eat any vegetables, and Kirsty would often throw a tantrum if there were vegetables on her plate. Kirsty's mam dealt with this by using the techniques she learned from her mentor and the Stress Control classes. She also used the techniques which she and Kirsty's dad had learned from the Triple P programme such as turning away and not paying attention to Kirsty when she was throwing tantrums and praising her when she ate a small portion of vegetables. As she watched Kirsty grow, she felt proud of how she was doing as a parent, and of how well her daughter was developing.

When Kirsty was 3 years old, she was allowed to watch a little TV every day, she really liked Peppa Pig and Dora the Explorer. After a few hours, her mam would switch off the TV and sit and play puzzles with her. At first, Kirsty would get upset when her mam turned off the TV and would push the puzzles away, but her mam would remain firm and follow through with the puzzles. When Kirsty began pre-school, her mam would wake her at the same time every day, make her breakfast, and walk her to pre-school. When Kirsty came home, they would have some play time together and talk about what she did during the day. Then after dinner and a bath, her dad would put her to bed.

When Kirsty was 4 years old, life was busy for her mam. She found Kirsty's behaviour a little difficult at times as Kirsty wanted to choose what to wear and what to eat on her own. But her mam realised this was just a part of Kirsty growing up and she didn't find these difficulties much of a hassle. As Kirsty was starting school soon, her mam was getting ready to leave the *Preparing for Life* programme. She felt sad that she wouldn't see her mentor every month, but was glad that she had taken part in the programme as she felt it really had helped her get Kirsty ready for school.

This story presents the life of a typical *PFL* child at school entry based on the data collected

Now that Kirsty has started Junior Infants, she is getting on very well and has successfully adjusted to school life. Her teacher says she was definitely ready to start school this year. During class she can sit calmly and pay attention to the teacher. She is a smart student and finds it easy to understand the new things her teacher explains to her. Kirsty particularly enjoys activities which involve patterns and numbers. At break-time she eats her healthy lunch without difficulty and she can go to the bathroom by herself. When the teacher asks the class to line up before going outside, she can easily follow the instructions. In the yard she has fun with her classmates and runs about playing games. When school is over, Kirsty's mam collects her and Kirsty tells her all about her day as they walk home together.

Chapter One

Introduction

"We all believed.... that Preparing for Life could really change a childs life"

PFL Mentor

Preparing for Life (*PFL*) is one of the most extensive randomised control trials of an early childhood intervention conducted in Europe. At its heart, the *PFL* programme seeks to provide families with a helping hand in getting their young children ready for one of the most important transitions of their life – starting school. *PFL* has shared the lives of over 200 families in an area of Dublin, Ireland, from pregnancy through to when the children started school. As their journey together has now drawn to a close, this report will answer the critical question - *"Did the PFL programme improve the lives of these children?"*

PFL was developed by local community groups in response to evidence that over half of all children from their catchment area were not ready for school when they began Junior Infants (Murphy et al., 2006; *Preparing for Life* & The Northside Partnership, 2008). This meant that they were lacking the skills needed to fully participate in school life. To be ready for school, children need to have a sense of numbers, letters and colours, and they need to be able to talk and communicate effectively with teachers and classmates. They have to be able to concentrate, follow instructions, mix well with others, and they should arrive at school with an eagerness to learn. Children also need to be physically healthy, capable, and independent to actively take part in classroom and playground activities.

By drawing together information from administrative records, parents, teachers, and the children themselves, this report considers whether the *PFL* programme improved the children's ability to successfully start school. Findings from earlier stages of the *PFL* evaluation have shown positive impacts of the programme on the children's cognitive development, emotions, behaviours, and health before they started school. In this report, we examine whether these early effects persisted and translated into improved school readiness in Junior Infants. In the rest of this chapter, you will be provided with the tools needed to fully understand the *PFL* programme – why it was developed, how it worked in practice, how it was delivered, and how its impact on children's lives was evaluated.

1.1 Why was the *PFL* programme developed?

PFL is a community-led programme operated by the Northside Partnership (NSP) in Dublin, Ireland. The programme was jointly funded by The Atlantic Philanthropies (AP) and the Department for Children and Youth Affairs (DCYA). The programme was developed over a 5 year period between 2003 and 2008 to address concerns that children from several communities within the NSP catchment area were consistently starting school without the necessary skills (see Murphy et al., 2006, *PFL* Evaluation Team, 2010).

The *PFL* programme considers 'school readiness' as children's skills across five areas[1]:

Figure 1.1 - *Five Domains of School Readiness*

The *PFL* programme was developed by 28 local agencies and community groups who collaborated to design an evidence-based intervention tailored to meet the needs of the local community. The programme provided a range of supports to participating families from pregnancy until school entry and staff used the *PFL* manual to guide their delivery of these supports (*PFL* Manual; *Preparing for Life* & The Northside Partnership, 2008). *PFL* was designed to prepare children for school by equipping parents with the skills needed to encourage child development from pregnancy onwards. A number of psychological theories support this approach, including the theory of human attachment (Bowlby, 1969), socio-ecological theory of development (Bronfenbrenner, 1986), and social-learning theory (Bandura, 1977). Figure 1.2 describes the role of these theories in the *PFL* programme.

[1] *These are based on the definition of school readiness from the National Education Goals Panel in the United States (see Emig, Moore, & Scarupa, 2000; Kagan, Moore, & Bredekamp, 1995).*

ATTACHMENT THEORY

The close emotional tie between a parent and an infant is referred to as attachment (Bowlby, 1969). Attachment during infancy is related to social, emotional, and cognitive skills later in childhood. Evidence shows that children with secure attachments to their parents are better able to take advantage of the opportunities that school offers, develop better social skills, and have greater emotional stability than insecurely attached children. The *PFL* programme works with parents to facilitate competent and confident parenting which is characterised by providing a nurturing environment, protection, and ultimately assisting in the development of secure attachment bonds between parent and child.

SOCIOECOLOGICAL THEORY

It is important to consider the multiple contexts a child lives in (Bronfenbrenner, 1986). A child is part of a family, a community, a childcare setting, and a school. A child's successful navigation of each of these settings depends on how they are faring in other areas – for example, how well they will do in school is connected to their family life. The *PFL* programme works under a socioecological theory of development as it incorporates many contexts of the child's life when delivering supports. The *PFL* programme reaches out to mothers, partners, grandparents, siblings, and other individuals involved in the child's life whenever possible. The programme also acknowledges that effective prevention and early intervention requires cooperation between child and family services and agencies. Therefore, the programme has initiated collaboration among state health, education, and social services in the community. The importance of service quality is also promoted, and the programme has supported the implementation of the Siolta early childhood curriculum framework in local early childhood care and education centres.

SOCIAL LEARNING THEORY

Social learning theory suggests that children learn from the consequences of their interactions in the world and from observing those around them (Bandura, 1977). In this sense, parents serve as models for their children, teaching through their own behaviour. As the *PFL* programme works with parents to make informed choices, it has the potential to affect child development. As parents begin to adopt more healthy and socially acceptable behaviours, they serve as positive examples for their children. In turn, children begin to engage in healthier behaviours and interactions.

Figure 1.2 - *Theoretical Underpinnings of the PFL Programme*

1.2 How does the *PFL* programme work?

The *PFL* programme design started with a logic model which set out how the *PFL* services would work to improve school readiness in children. The logic model is displayed in Figure 1.3. This model outlines the inputs required to start the programme, the activities involved in making the programme work, the outputs of the programme, and the intended outcomes. The inputs included funding, local support, and the initial project plan. The activities were the supports offered to improve parenting skills, the steps taken to improve local services, and the evaluation of the programme. The outputs included the programme manual, the establishment of the programme and its activities, trained staff, and the evaluation reports. Finally, the anticipated outcomes were short and long term improvements in children's development, in parents' wellbeing and parenting skills, and in local services.

PFL LOGIC MODEL

INPUTS

- Generate **investment** from Atlantic Philanthropies and the Department of Children and Youth Affairs
- Get buy-in from organisations for **local support**
- Draft the *PFL* **plan** – a report on what needs to be done and how to do it

ACTIVITIES

Promote child development by:

Improving parenting skills through

1) Mentoring
2) Group parenting training
3) Quality childcare and pre-schooling

Developing and integrating services through

1) Redesigning existing services and increasing capacity to ensure quality pre-school programmes
2) Annual agreements between *PFL* and local agencies

Evaluating programme activities & outcomes

OUTPUTS

- Programme **manual** designed and reviewed
- **Mentors** trained and working with families
- Parent training **courses** established
- Quality pre-school **curriculum** in place
- Preschool and childcare **capacity** increased
- **Public health programme** developed with the Health Promotion Service
- Early intervention **activities and treatment** developed
- *PFL*-Agency service **agreements** in place
- Evaluation **reports** produced and released
- Programme **administration** carried out to a high standard

OUTCOMES

SHORT TERM (2008 – 2013)

Expect to see year-on-year improvements in

- **Children's health** – physically, emotionally, and psychologically
- **Children's skills** – with respect to education, speech, and motor skills
- **Parents** – with respect to psychological health, parenting skills, and in their aspirations for their children

Expect to see community services development in

- A sustained public **health promotion programme**
- **Improved existing services** - child and family services in the area are better co-ordinated and better meet identified needs

MEDIUM TERM (2013 – 2015)

As the first *PFL* children begin to enter school, expect to see

- Improvements in **school readiness**
- Greater **enjoyment of parenting**
- The **roll-out of *PFL***, in its successful elements, to all newborns in the catchment area and other disadvantaged areas

LONG TERM (2019 +)

As the first *PFL* children enter late childhood and beyond, expect to see

- **Sustained gains for children and parents** into late childhood

See *PFL* hold a primary influence on

- **National policy** for prevention and intervention
- Integrated **service delivery** at local area level

Figure 1.3 - *PFL Logic Model*

1.3 Where did the *PFL* programme operate?

The original *PFL* catchment area included the communities of Belcamp, Darndale, Moatview, Newtown Court, and the Traveller Community in Dublin 17. Due to slow recruitment, the *PFL* catchment area was expanded to include the areas of Ferrycarrig, Glin, and Greencastle in January, 2009. A second expansion began in late June, 2009 to include the communities of Bonnybrook and Kilmore West. Before any new areas were added, analyses were conducted to ensure that the expansion communities were demographically similar to the original catchment area.

According to Census data from 2006, which was the latest available data prior to the start of *PFL*, there were around 15,000 people living in the combined *PFL* communities. Forty-two percent of families were living in social housing, 7% of the population had completed third level education, and the unemployment rate in the area was approximately three times the national average at 12%.

1.4 How did families join the *PFL* programme?

All pregnant women living in the catchment area between 2008 and 2010 were able to take part in the *PFL* programme. There were no exclusion criteria meaning that everyone was entitled to take part, although participation in the programme was voluntary. Recruitment took place through two maternity hospitals, from self-referrals by the participants themselves, and referrals from partner organisations in the community. In total, 233 women agreed to take part in the programme, and of those, 74% were from the original catchment area, 17% were from the first expansion area, and 9% were from the second expansion area. The women recruited accounted for 52% of all those eligible to take part. The remaining eligible women were not identified at recruitment (22%), or were approached but refused to participate or could not be contacted again after initial contact was made at the hospital (26%).

A sample of women (n=102) who were eligible to take part in the programme but did not join, completed a short survey when their children were 4 years old. The survey showed that the mothers who did not join the programme were older, were more likely to have had a job during pregnancy, and had spent a longer time in school than the mothers who joined the programme. This suggests that the programme was effective in recruiting families most in need of the intervention.

1.5 How were the *PFL* families randomised?

The impact of the *PFL* programme on participating families was tested using a randomised control trial (RCT) design. Once the women agreed to join the programme, they were randomly assigned to either a high support treatment group (n=115) or a low support treatment group (n=118) using a computerised randomisation protocol. This meant that they had an equal chance of being in either group. Participants were given detailed information about the programme and the evaluation, and provided informed consent to join the programme before they were randomised to either group. Before the intervention began, the women completed a survey about their family's characteristics. This information was used to test whether the characteristics of the mothers in the high and low treatment groups were similar. If randomisation was successful, there should have been very few differences between the groups 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 programme caused these differences and not any underlying characteristics

of the families. We found that the families in the high and low treatment groups were very similar before the programme began, and did not statistically differ on almost all of the 117 measures analysed (92%), showing that randomisation was successful. [2] Figure 1.4 below describes the characteristics of the *PFL* families when they joined the programme.

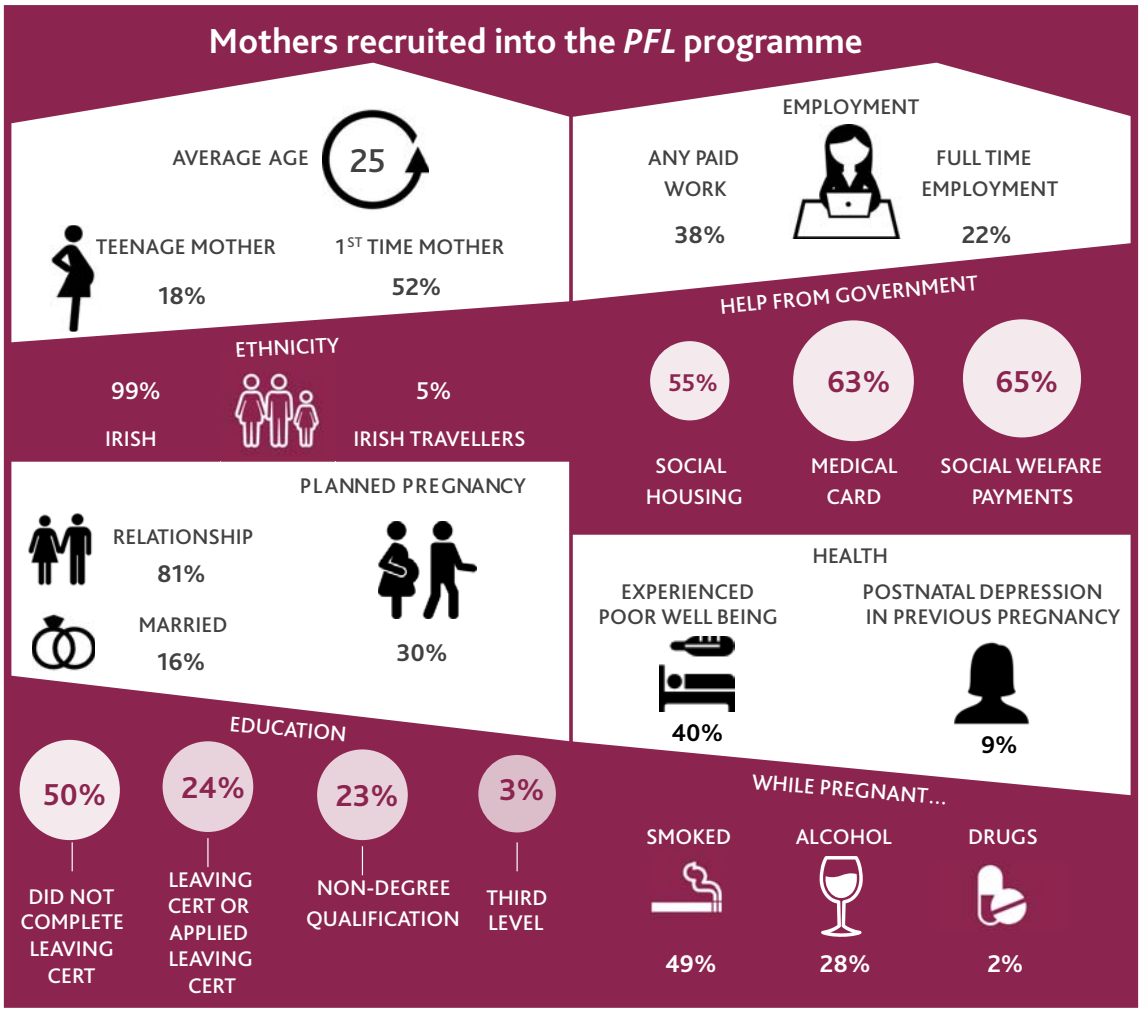


Figure 1.4 - *Characteristics of the PFL Families at Recruitment*

1.6 What supports did the *PFL* programme provide?

Both the high and low treatment groups received a number of common supports, while the high treatment group received some additional intensive parenting supports.

1.6.1 High treatment group supports

The families in the high treatment group received a 5-year home visiting programme, and were offered the Triple P Positive Parenting Programme and baby massage classes. Each of these are detailed below. These supports were delivered by a group of *PFL* mentors who were assigned to families at recruitment, and the same mentor worked with the family over the course of the programme (when possible). Figure 1.5 explores the important role of the *PFL* mentors and their relationship with families.

[2] *See "Preparing for Life Early Childhood Intervention Assessing the Early Impact of Preparing for Life: Baseline Report" under publications at http://geary.ucd.ie/preparingforlife*

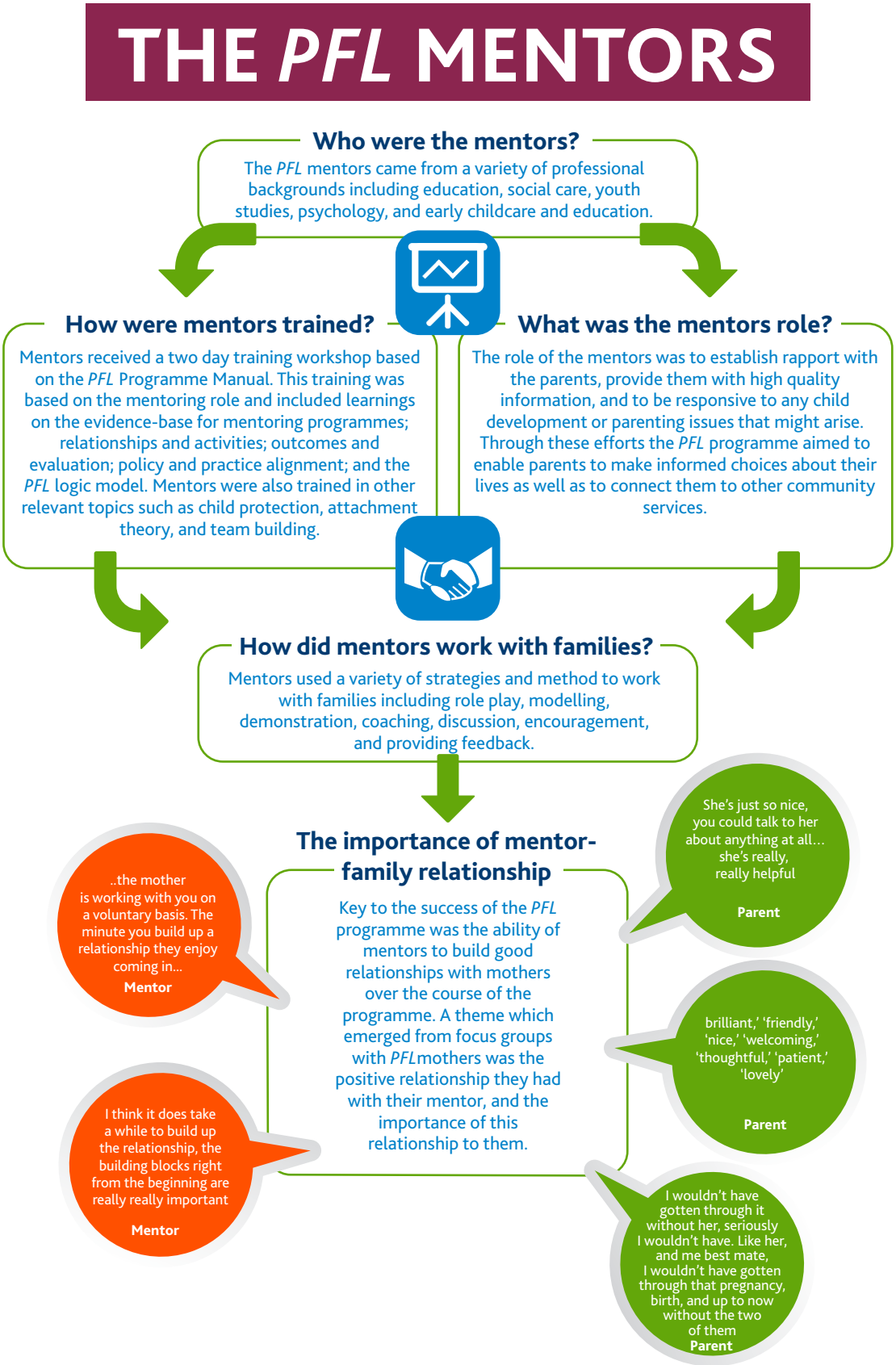


Figure 1.5 - *The Role of the PFL Mentors.*

PFL HOME VISITING PROGRAMME

The main support provided to families in the high treatment group was the 5-year *PFL* home visiting programme. The programme involved regular visits by the mentors to the family home to support and educate parents on child development and parenting issues. The home visiting model has been widely used in preventive interventions, by providing parents with information, emotional support, access to community services, and by enhancing parenting skills (Howard & Brooks-Gunn, 2009). The evidence as to whether home visiting programmes can help families and children is mixed. While some home visiting programmes have been found to benefit children and families in a number of areas, the effects are modest in size, and not consistent across programmes (Avellar et al., 2016; Filene, Kaminski, Valle, & Cachat, 2013; Gomby, 2005; Peacock, Konrad, Watson, Nickel, & Muhajarine, 2013; Sweet & Applebaum, 2004). Detailed reviews on the effectiveness of home visiting programmes have suggested that these programmes have a stronger impact on children's cognitive, social, and emotional development, than on their health (Avellar & Supplee, 2013; Avellar et al., 2016; Filene et al., 2013).

The *PFL* manual recommended that mentors visit the family home for between 30 minutes and 2 hours every week, starting during pregnancy and continuing until the children started school. As some parents found weekly visits too intensive, the frequency of visits was adapted to meet the needs and wishes of the families, with most families receiving fortnightly to monthly visits.

> "At the start, it was sort of a little bit too much for me, but now it's grAND, I don't have to go so many times..... I don't have to see her so much, because they wanted me to see her every week"
>
> High Treatment Mother

> "Originnally the home visits were supposed to be weekly, and that just felt like way too much to be going in every week to the families. It's a really big commitment...so that beacame once a forthnight, and for some families it's less than that. Its better to have them on the programme seeing them once a month than them say "I haven't got time for this, I'm off." So that was something we tweaked"
>
> *PFL* Mentor

During the home visits, the mentors used a set of 'Tip Sheets' which offered help and guidance on promoting child development and ways for the mother to look after herself. A home visit generally began with a family update and a discussion of the goals set at the previous visit. The mentor would then guide the parent through the Tip Sheet(s) selected for that visit and following this, new goals would be agreed with the family. Most visits took place in the participant's home, but in some cases, the local community centre was used as a meeting point.

PFL TIP SHEETS

"I found it very hard at the start you know trying to get them into routines and stuff but I found the Tip Sheets they gave me on that was great as well"

High Treatment Mother

"I think the Tip Sheets are brilliant, they are non-invasive, they are really simplified, easy to understand. I haven't met a family yet that hasn't enjoyed the Tip Sheets. Mostly the families when you go to a visit will have the folder there and ready and they're waiting for you to come"

PFL Mentor

The *PFL* Tip Sheets are colourful information sheets covering five areas of: pre-birth, nutrition, rest and routine, cognitive and social development, and the mother and her supports. These areas were selected during the programme development stage as they were found to be important areas of need in the community. The Tip Sheets were developed using evidence from academic sources and information from practitioners and local resources in Ireland. They were designed to be easy to read and easy to understand. The Tip Sheets were provided to the family by the mentors according to the age and needs of the child, with the intention that by the end of the programme all families would receive the complete set.

A total of 210 Tip Sheets were available to families over the course of the programme. Eighty-five percent of these Tip Sheets were dedicated to the *PFL* child (n=178) and the rest focussed on the mother and her supports. The Tip Sheets for the *PFL* child dealt with areas of development important for future school readiness. The majority of Tip Sheets concentrated on one area of development, however, some were broader and tapped into multiple areas of development (see Figure 1.6 for an example). Figure 1.7 illustrates the number of Tip Sheets dedicated to each of the five domains of school readiness. Twelve percent of the Tip Sheets (n=22[3]) encouraged the development of cognitive skills, such as learning numbers and colours. Fourteen percent of the Tip Sheets (n=25) were about developing children's language, such as how to pronounce sounds, ways parents could interact with the child to encourage language development, and reading activities. Sixteen percent of Tip Sheets (n=30) encouraged children's development of positive approaches to learning. These Tip Sheets focussed on using play to encourage children to learn. Almost one third of the Tip Sheets (n=60) dealt with social and emotional development, and included issues such as attachment, routine, regulation, and relationships. Finally, the majority of the Tip Sheets addressed physical wellbeing and motor development (n=105). This was a large area covering issues such as general child health, immunisation, nutrition, safety, and sleep.

[3] *These totals also count Tip Sheets which emphasised all five domains of school readiness.*

Playing and learning

Things you can do to help your baby:

Encouraging children to play and explore objects can instil **a positive approach to learning**

- **Give your baby large blocks and toys with wheels to play with.**

  Your baby will pick things up and shake them, listening to the sounds they make, especially when he/she drops them.

Manipulating objects will also encourage **gross and fine motor skill** development

- **Show your baby his/her image in a mirror.**

  Your baby will touch and even kiss the image.

- **Sit down, talk and read with your baby.**

  Your baby's speech and language will develop. He/she will love being close to you on your lap and will learn if you are happy by the way you look and speak. He/she will get excited when he/she sees pictures in books.

Talking to and reading with babies will encourage their development of **language and conitive skills**

This contact will encourage **social and emotional development** as the child feels safe and secure

- **Spend time holding and cuddling your baby during daily routines such as nappy changing.**

  Your baby will feel secure and bonded to you. He/she will be interested in what you are doing.

- **Point to your body parts, such as your eyes and ears and say each name out loud.**

  Listening to you and watching you point helps your baby to understand the parts of his/her body.

- **Make different funny faces when you are playing with your baby.**

  Your baby will laugh at your funny faces and try to copy them.

Figure 1.6 - *Example of a Tip Sheet Spanning Multiple Domains of Development*

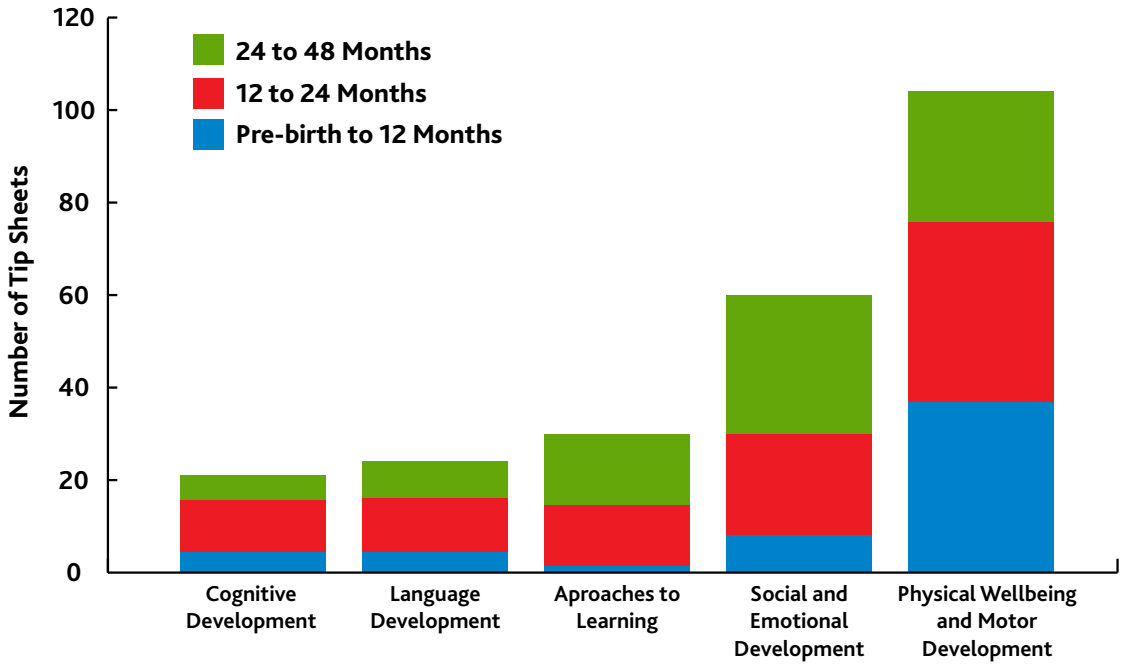


Figure 1.7 - *Number of Tip Sheets by School Readiness Domain*

TRIPLE P POSITIVE PARENTING PROGRAMME

> *"I thought it was brilliant, excellent, I thought it was brilliant....Triple P learns you, like, discipline and how to discipline and how not to discipline and it's very good"*
>
> High Treatment Mother

The high treatment group were also offered parenting skills training through the Triple P Positive Parenting Programme once their children had turned 2 years old. The goal of Triple P is to encourage positive, effective parenting practices to prevent problems in children's development (Sanders, Markie-Dadds, & Turner, 2003). The programme is based on five principals of parenting: 1) providing a safe, engaging environment, 2) the home as a positive place to learn, 3) setting of rules and boundaries, 4) realistic expectations of children, and 5) parental self-care (Sanders, 2012). Triple P strategies emphasise positive reinforcement of good behaviour while minimising parents' reaction to challenging behaviour. The Triple P programme is considered a 'gold standard' intervention due to strong evidence in support of its effectiveness (see Sanders, Kirby, Tellegen, & Day, 2014).

The Triple P programme includes five levels of increasing strength, and each level can be delivered in a number of ways (Sanders, 2012):

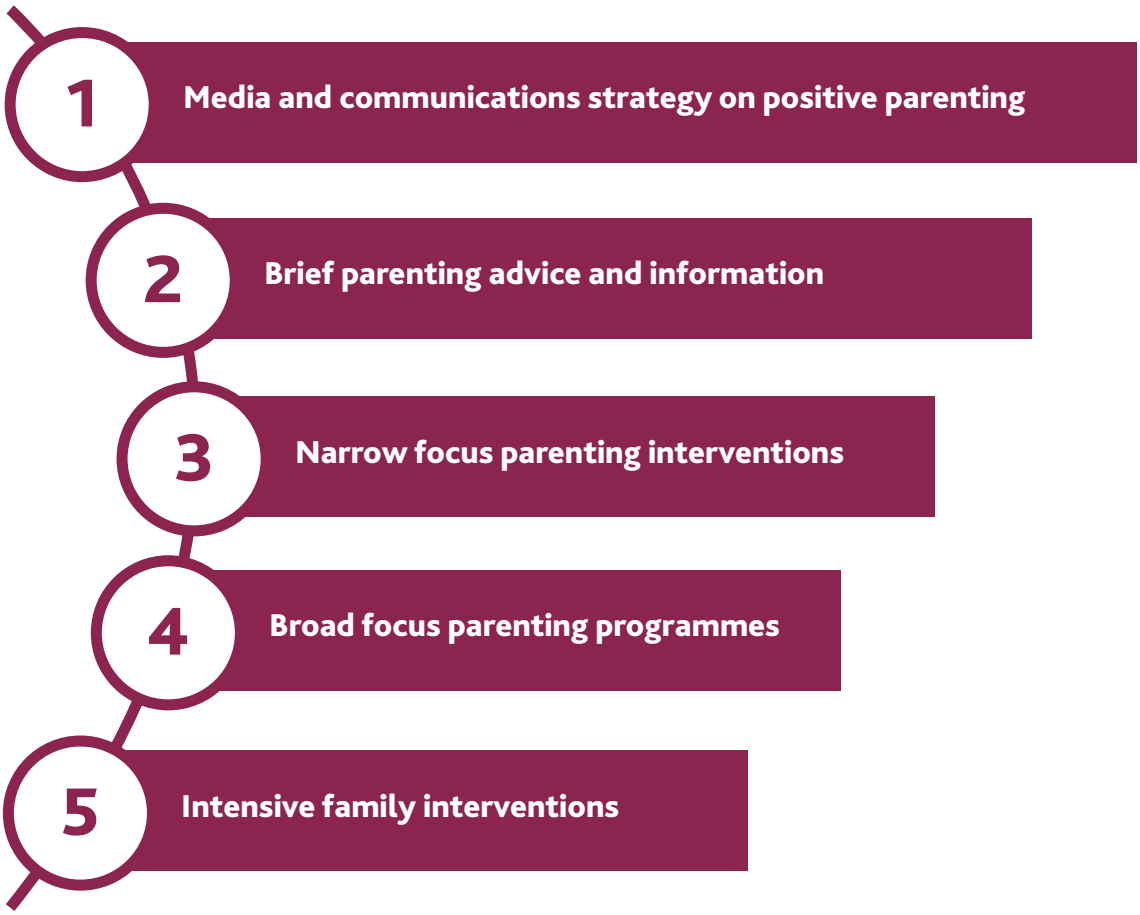


Figure 1.8 - *The Five Levels of the Triple P Programme*

The *PFL* mentors were trained to deliver the Triple P Positive Parenting programme by core Triple P staff. Table 1.1 shows the Triple P supports offered to the high treatment group. Initially, families were offered Level 4 broad focussed Group Triple P which involved an 8 week course on positive parenting skills including 4 group classes, three weeks of phone calls, then a final class. Where necessary, Level 3 narrow focus primary care sessions were offered to individual families. In these cases issues with particular aspects of the child's behaviour or development were addressed. Due to the time commitment required, a number of parents became less engaged over the course of the Triple P training. As a result, discussion groups (Level 3) were also offered to reduce the time burden on parents.

Table 1.1 - *Delivery of Triple P Parenting Positive Programme by the PFL Programme*

LEVEL	*PFL* DELIVERY METHOD	NUMBER OF SESSIONS	SESSION DURATION	FORMAT	LOCATION	FOCUS
3	Primary Care	4 Weekly sessions	30-60 mins	Individual	Participant's Home	These sessions targeted a particular aspect of child behaviour or development, e.g., tantrums, toilet training, aggression.
3	Discussion Groups	4 Standalone sessions (Offered twice)	90 mins	Group	*PFL* Premises	Each discussion group had a specific topic, e.g., bedtime routines, fighting and aggression, dealing with disobedience, and hassle-free shopping
4	Group Triple P	5 Group classes & 3 individual phone calls	120 mins	Group	*PFL* Premises	Positive parenting skills for multiple child behaviour issues.

BABY MASSAGE CLASSES

"Like the baby massage that I was saying to youse. That was brilliant it was"

High Treatment Mother

"I think baby massage had a really good effect...on the attachment as well"

PFL Mentor

Families in the high treatment group were offered baby massage classes from birth until their infant was approximately 10 months old. These classes were provided by the mentors who were trained by Baby Massage Ireland. The purpose of these classes was to equip mothers with baby massaging skills and to emphasise the importance of interaction and communication between parents and babies.

Families were offered five baby massage group sessions, each lasting around 2 hours. Where participants were unable to attend group sessions, individual sessions of around 40 minutes were offered instead. The number of individual sessions was dependent on the family's needs. Group classes took place in the local community centre and individual sessions in the participant's home or the *PFL* centre.

1.6.2 Supports common to high and low treatment groups

A number of low level supports were available to both the high and low treatment groups, each of which is described below.

"...they got so much out of it and it was just a case of just meeting other parents and sharing their concerns and knowing that they're not alone and it was, it was really good it worked really well."

PFL Mentor

SOCIAL EVENTS

Families were invited to a number of social events hosted by the *PFL* programme. These events were not originally included in the *PFL* programme manual but were offered as a response to requests from parents who wanted an opportunity to meet with other *PFL* participants and parents in the community. The main focus of each event varied, and included coffee mornings, information sessions (e.g. a talk by a dental nurse), family events, and Christmas craft fairs. These social events occurred three to four times each year and typically lasted 1 to 2 hours.

FACILITATED ACCESS TO LOCAL SERVICES

Families in the high and low treatment groups received a directory of local services and access to a *PFL* support worker who they could contact at any time with queries on services for their family. For example, they could contact the support worker for information on local housing and childcare centres.

In the high treatment group, the mentors acted as the support worker, while the low treatment group had access to the *PFL* Information Officer. The Information Officer did not provide the low treatment families with any information about parenting or child development.

> "It has everything on it you know everything in it like...it's every type of service it's, all the services around here fire brigade, garda stations, hospitals, doctors, pharmacies ...yeah so, ...stuck to me fridge so that whenever I want anything I'll be able to go through it rather than root through the phone book"
>
> *Low Treatment Mother*

DEVELOPMENTAL TOYS AND BOOK PACKS

> ".the developmental toys and ya know my daughter loves the play mat, I got the play mat from them and she absolutely adores it like she'll sit on it for an hour or two a day and like pulling at the things and all it's great for colour like and hand-eye coordination and everything, absolutely loves it"
>
> High Treatment Mother

> "Ah they were good, like yeah, she loves the books, 'cos one of them is a squeaky book like and she loves that"
>
> *Low Treatment Mother*

Both treatment groups were offered a supply of developmental toys annually (to the value of ~€100 per year). The first developmental pack included safety items such as corner guards, angle latches, and heat sensitive spoons, plus a baby gym/play mat. The second pack consisted of developmentally appropriate toys such as puzzles, activity toys, and bricks. The third pack contained cookery/construction sets, puzzles, and memory games. The fourth pack included a magnetic game, a doctor's case, a lace-up shoe, and a tea set, while the fifth pack included a range of puzzles and memory games.

Book packs were provided on four occasions from when the child was 3 months old until they were 3 years old. Each pack contained between six and eight books and included a mixture of picture books, activity books, stories, classic stories and fairy tales, and books introducing educational concepts such as colours, shapes, numbers, animals, and words.

PUBLIC HEALTH WORKSHOPS

Families from both groups were encouraged to attend public health workshops hosted by the *PFL* programme on stress control and nutrition. The Stress Control Programme[4] was delivered by an external facilitator and consisted of 6 weeks of one-hour sessions. The aim of these sessions was to learn about stress, the indicators of stress, and strategies for managing stress. Those who attended received a set of booklets and a relaxation CD. The Healthy Food Made Easy programme was facilitated by one of the *PFL* mentors and involved 6 two-hour sessions. The programme aimed to improve food knowledge, attitudes, and behaviour by learning about basic nutritional theories and participating in activities. The programme emphasised group learning through discussion, worksheets and hand-outs, quizzes, problem solving games, food preparation, and practical cookery sessions.

FACILITATED ACCESS TO ENHANCED PRE-SCHOOL

All families were encouraged to avail of the Free Pre-School Year in Childhood Care and Education (ECCE) Programme, which entitles all children in Ireland from the age of 3 years access to a free pre-school place for 38 weeks. The *PFL* programme worked in partnership with other organisations to improve the quality of childcare services in the local community in line with Síolta, the National Quality Framework for Early Childhood Education. This was to ensure that all families had easy access to a quality pre-school programme in their local childcare centre.

OTHER PROVISIONS

All participants received framed professional photographs of their child when they were a baby and in their first week of school, regular programme newsletters, and greeting cards to mark special occasions.

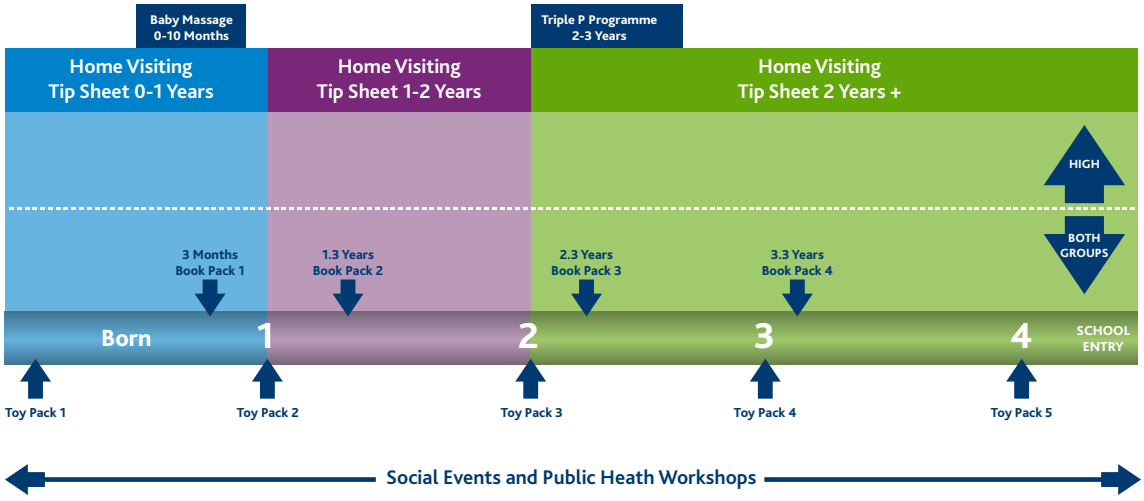


Figure 1.9 - *Supports Provided to the High and Low Treatment Groups*

[4] *For additional information visit: www.glasgowsteps.com.*

1.7 How was the *PFL* programme delivered?

This section summarises how the *PFL* programme was delivered in practice. Figure 1.10 considers attrition and how many families stayed in the study. Figure 1.11 describes participant engagement and how much support from the *PFL* programme the families received. Figure 1.12 examines the possibility of contamination and whether the low treatment group received any information or supports which were only offered to the high treatment group.

ATTRITION

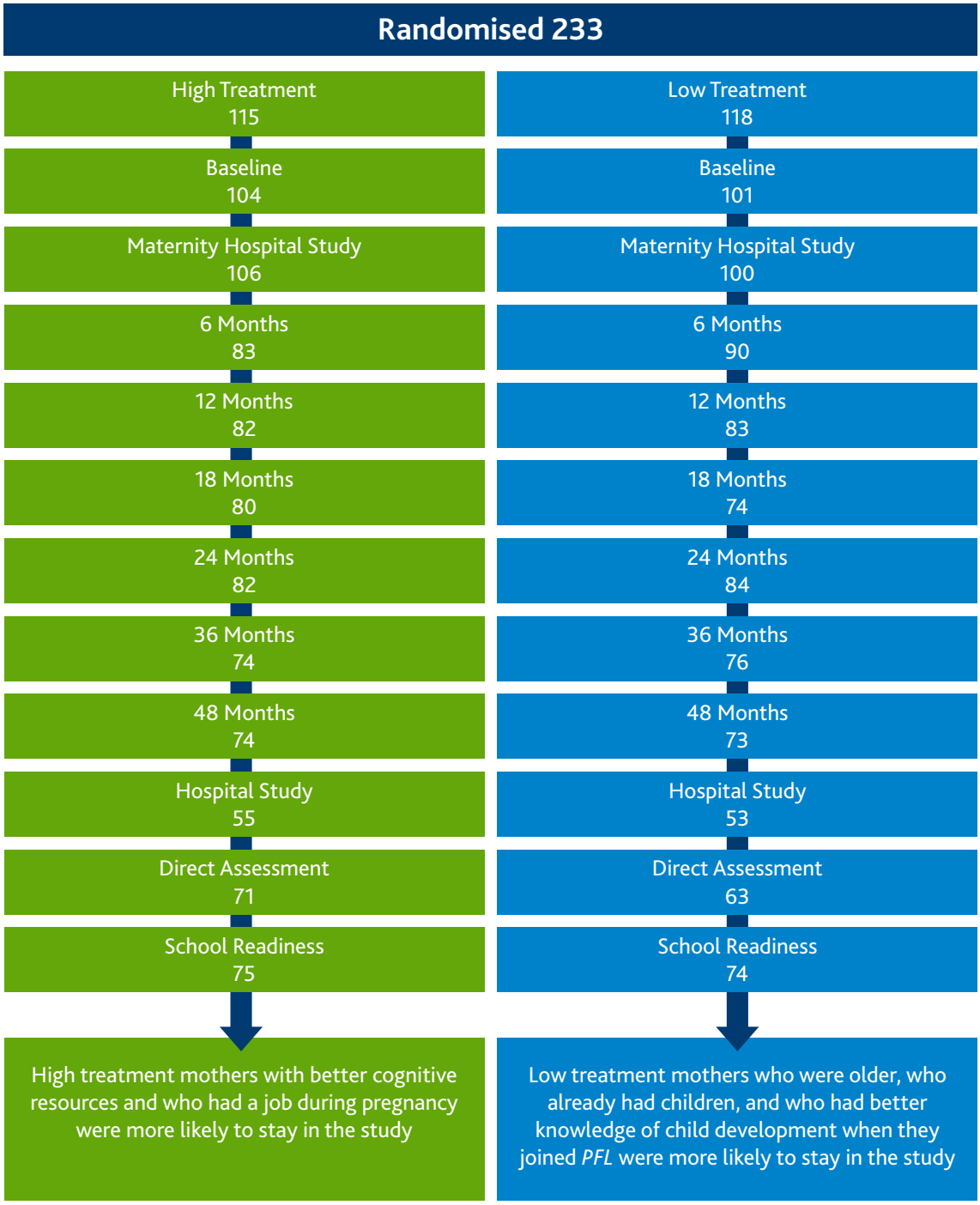


Figure 1.10 - *Number of Participants who Stayed in the PFL Study*

ENGAGEMENT

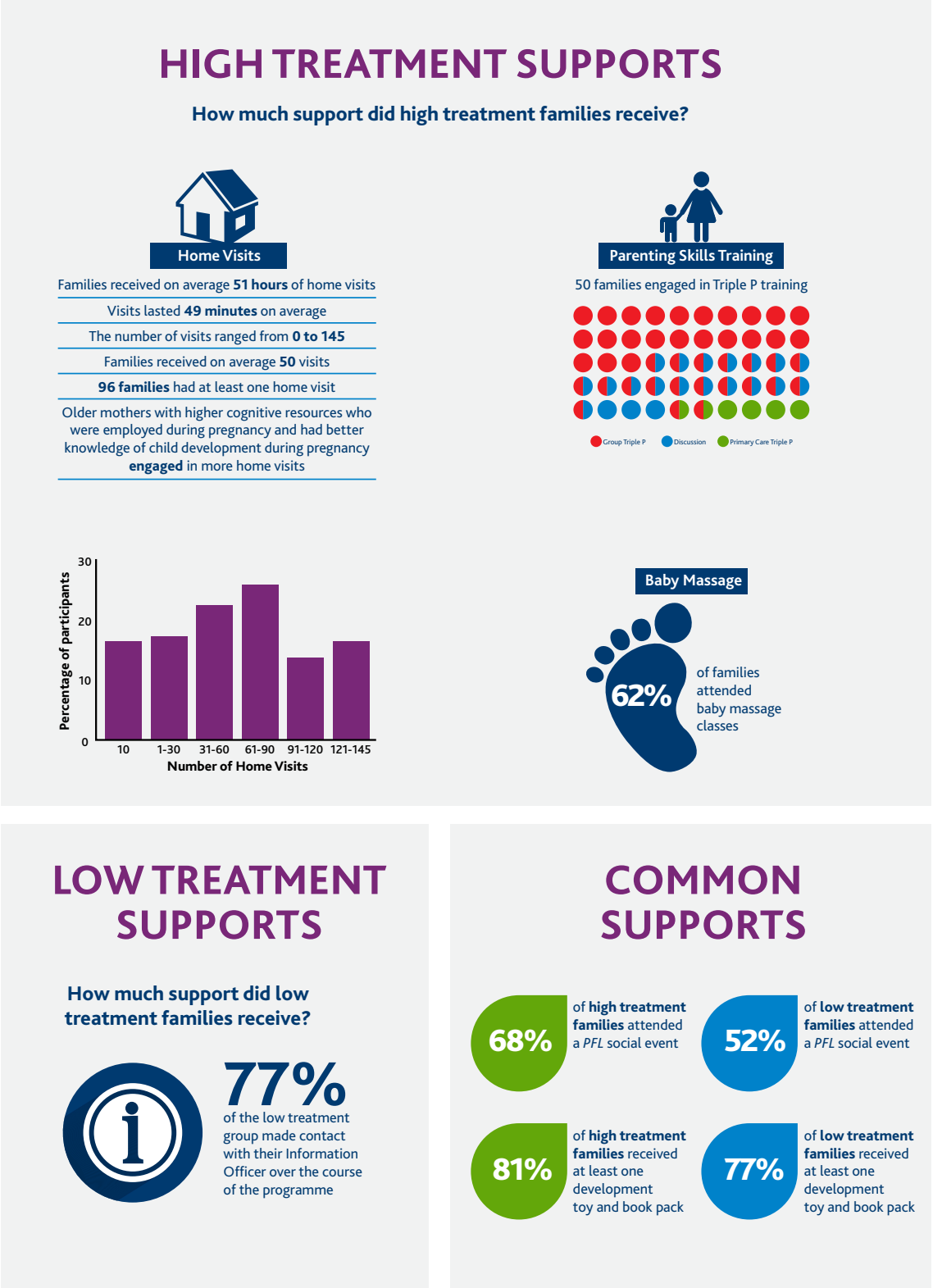


Figure 1.11 - *Participant Engagement in the PFL Programme*

CONTAMINATION

WHAT IS CONTAMINATION?

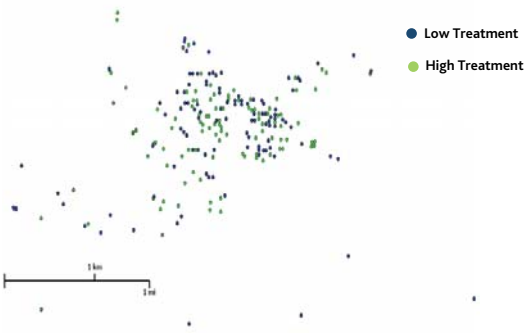
Contamination may have occurred if the high treatment group shared programme materials with participants in the low treatment group, or if the low treatment group accessed the type of information included in the programme themselves.

HOW DID WE TEST CONTAMINATION?

Contamination was tested by asking both groups if they knew **what particular parenting phrases mea**nt. These phrases were discussed by mentors during the home visits. If the percentage of participants who knew what these phrases meant were similar in the high and low treatment groups, it suggests contamination occurred.

HOW LIKELY WAS CONTAMINATION IN THE *PFL* SAMPLE?

Contamination was very likely as *PFL* took place in a **small community** where participants in the two treatment groups were family, friends, or neighbours.



Proximity of High and Low Treatment Groups' Homes

DID CONTAMINATION OCCUR?

We that found **significantly fewer** low treatment mothers knew what the phrases meant compared to high treatment mothers, suggesting that **major contamination had not occurred**

HAVE YOU HEARD THE PHRASE...?

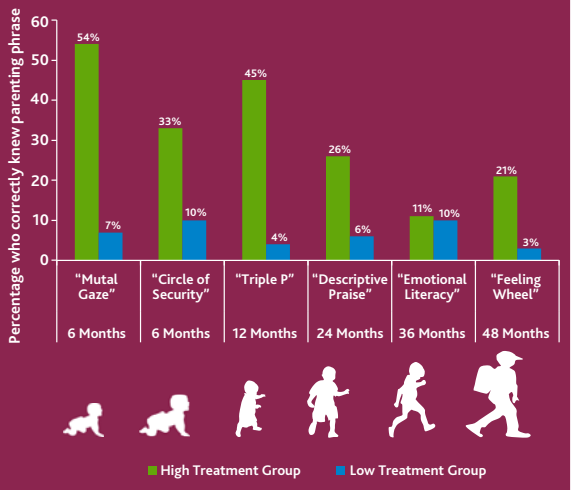


Figure 1.12 - *Contamination in the PFL Programme*

1.8 How was the *PFL* programme evaluated?

The UCD Geary Institute for Public Policy has evaluated the delivery and the impact of the *PFL* programme since 2008. Information was collected on families from birth until their children started school. Data was collected from mothers, teachers, the children themselves, and administrative records from hospitals and the *PFL* implementation team. Figure 1.13 shows the timeline and sources of data collected and the following section summarises the type of information collected from each source.

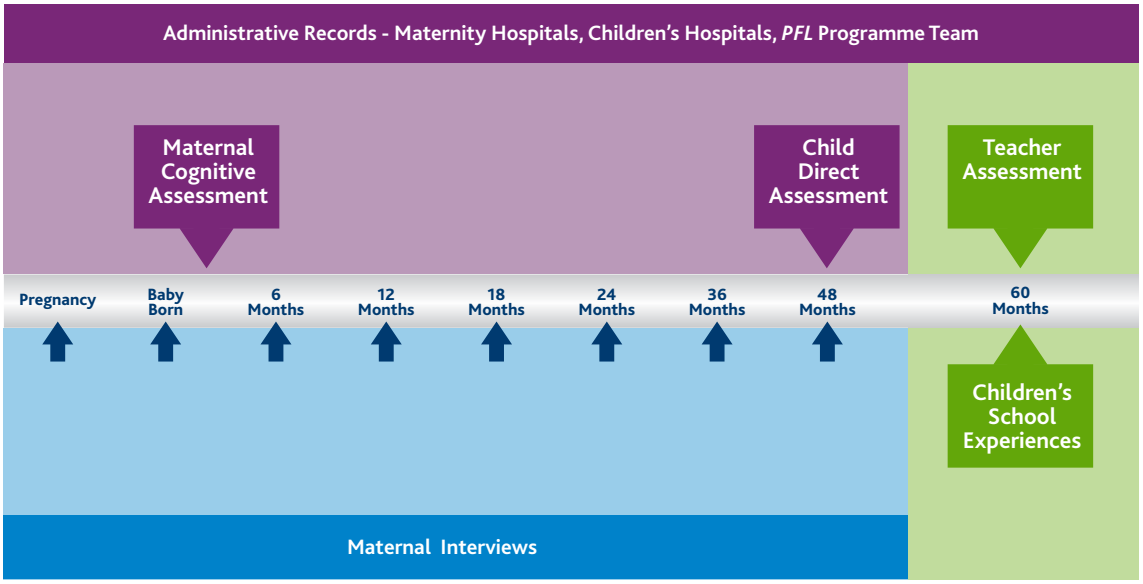


Figure 1.13 - *Timeline and Sources of Data Collection for the PFL Evaluation*

INTERVIEWS WITH MOTHERS

Interviews were conducted with mothers in the high and low treatment groups when they were pregnant, and when their child was 6, 12, 18, 24, 36, and 48 months old. Interviews lasted between 1 and 2 hours and were conducted on a laptop computer at the participants' home or a local community centre. In these interviews mothers were asked about their child's development, as well as their own attitudes, feelings, and behaviours. From 24 months onwards, children's height and weight were measured during these interviews. Maternal cognition was measured during the first year of the programme using the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999).

DIRECT ASSESSMENT OF CHILDREN

The *PFL* children's cognitive and executive functioning abilities were assessed when they were on average 51 months old. The assessments took place in the home, local community centre, or childcare setting and lasted approximately 30 minutes. During the assessments the children took part in a number of tasks with words, pictures, blocks, and stickers. Their cognitive abilities were measured using the upper level Early Years Battery of the British Ability Scales: Second Edition (BAS II; Elliott, Smith, & McCulloch, 1997). Children's executive functioning skills were measured using two tasks which assessed how well they could control their attention and impulsive behaviour (Modified Day/Night task, Gerstadt, Hong, & Diamond, 1994; Kochanska, Aksan, Penney, & Doobay, 2007 and a Delay of Gratification task, Mischel, Shoda, & Rodriguez, 1989).

Executive functioning skills allow children to plan, organise, remember, pay attention, and control impulsive behaviour

JUNIOR INFANT TEACHER REPORTS

When the *PFL* children were in the first term of Junior Infants, and on average 59 months old, their teachers completed an online survey about their school readiness. School readiness was measured using sets of questions on the child's behaviour in school and the short-form of the Early Development Instrument (S-EDI; Janus, Duku, & Stat, 2005). The S-EDI offers information on children's physical health and well-being, social competence, emotional maturity, language and cognitive development, and communication.

As part of the Children's Profile at School Entry study (CPSE)[5], information on the school readiness of all children attending school in the *PFL* area was collected from 2008 to 2015. The information from children who were not part of the *PFL* programme was used as a community norm which indicated the proportions of *PFL* children who were 'Not on Track' in their school readiness compared to everyone else in the community.

INTERVIEWS WITH CHILDREN

Researchers conducted one-to-one interviews with a sample of *PFL* children in the high and low treatment groups to explore their school experiences during their second term of Junior Infants. Children had been in Junior Infants for approximately seven months at the time of the interviews and they were aged 62 months on average. These interviews lasted approximately 45 minutes. Children were shown pictures of typical aspects of the school day and were asked how the children in the pictures felt using the Pictorial Measure of School Stress and Wellbeing scale (Murray & Harrison, 2005). The children were also asked to draw a picture of themselves in school and tell the researcher about what they drew (Mitchell, Theron, Stuart, Smith., & Campbell, 2011). Finally, a character named Riley Rabbit was used to ask children other questions about school such as "what do you find hard in school? What makes it hard?"

ADMINISTRATIVE RECORDS

Apgar scores indicate how well the baby is doing just after birth

Hospital records for the *PFL* children were obtained from their maternity hospital records at the Rotunda Hospital and the National Maternity Hospital Holles Street, and from Temple Street Children's University Hospital. These hospital records included details on labour onset and delivery methods, Apgar scores, birth weight, gestational age and prematurity, and hospital attendance and diagnoses up to age 4. Finally, the *PFL* Implementation Team's administrative records provided details on the frequency and amount of supports delivered to the families over the course of the programme.

Results on the impact of *PFL* up until 48 months old using the maternity hospital records and maternal interviews have already been reported in previous publications which can be found at http://geary.ucd.ie/preparingforlife. This report summarises these previous findings, but focusses on the data collected when the children started school.

[5] *Please see for* ***http://geary.ucd.ie/preparingforlife/wp-content/uploads/2013/06/CPSE-2008-2013.pdf*** *for full details on participants and all results from the CPSE study.*

1.9 Outline of the report

Chapters 2 to 6 in this report describe the impact of the *PFL* programme on the five domains of school readiness:

- Cognitive Development,
- Language Development,
- Approaches to Learning,
- Social and Emotional Development, and
- Physical Wellbeing and Motor Development.

Each chapter begins by describing the importance of that domain to children's lives, and provides a summary of the findings published to date on the impact of *PFL* on that domain using maternal interviews (and maternity hospital records when relevant). Next, new results are presented using children's hospital records, teacher reports, and direct assessments with children to evaluate the impact of *PFL* on children when they started school. Following this, each chapter presents results from the children's interviews highlighting the relevance of each school readiness domain to their school experiences. Chapter 7 considers the validity of the *PFL* results, and the final chapter concludes with a discussion of how and why the *PFL* programme had an impact on children's lives, and consideration of the implications of the findings for policy, practice, and research.

How did we analyse the *PFL* data?

All analyses in this report use Inverse Probability Weighted permutation tests and control for child gender to ensure the results are not biased by the small sample size, attrition, or the imbalance between boys and girls in our sample. These methods are detailed below. Applying these rigorous methods means that we can confidently conclude that any identified statistical differences between the high and low treatment groups is indicative of a programme effect, i.e. that the supports provided to the high treatment group between programme entry and exit were effective at improving child outcomes.

OVERCOMING THE SMALL SAMPLE SIZE

As the number of families in the *PFL* study was quite small, traditional statistical techniques which are based on large samples were not appropriate. Instead, permutation tests were used to check for statistical differences among the high treatment group and the low treatment group. The permutation tests worked as follows: first the observed test statistic was calculated by comparing the mean outcomes of the high and low treatment groups. Second, the data were repeatedly shuffled so that the treatment assignment of some participants was switched between the high and low treatment groups. Third, the p-value for the permutation test was computed by examining the proportion of permutations that had a test statistic more extreme than the observed test statistic. If the proportion was small, we knew that the original statistic was an unlikely outcome. This method provided evidence that something other than chance was driving the relationship. In this report, we used permutation tests based on 100,000 replications. We report *p*-values from one-sided tests in order to test the null hypothesis that the high treatment group did not outperform the low treatment group.

OVERCOMING PARTICIPANT ATTRITION

At programme entry there were very few statistically significant differences in the baseline socio-demographic characteristics of the high and low treatment groups. This told us that the randomisation procedure was successful. However, at each point of data collection there was missing data due to participant attrition from either the programme or from the research interviews. This may have biased the results if the types of participants who dropped out or did not complete a particular assessment differed across the high and low treatment groups. We addressed this issue by applying an Inverse Probability Weighting (IPW) technique. This method involved modelling the probability of completing an interview at each assessment point using the participant's baseline characteristics. Then we used these probabilities as weights in the outcomes analysis so that a larger weight was given to participants who were underrepresented in the sample due to attrition.

The IPW technique entailed the following steps:

1 In order to select which baseline measures were used to model the probability of completing an assessment, we applied the Bayesian Information Criterion (BIC; Schwarz, 1978). The BIC, which measures goodness of fit, was calculated for different combinations of baseline measures while accounting for the number of measures included in the model. First, 50 baseline variables were included and the BIC was calculated and stored. Next, one measure was excluded and the BIC was calculated and compared to the stored BIC. If the new BIC was more than 2 points smaller than the stored BIC (i.e. a lower BIC indicates a model with greater prediction), the new BIC was stored and the process continued by testing all possible combinations of measures until the optimal set of baseline measures had been identified. This was done separately for the high and low treatment groups.

2 The optimal sets of baseline measures were then included in separate logit models to calculate the predicted probability of completing the relevant stage of data collection for each participant. Models were conducted separately for the high and low treatment groups to allow for differential attrition.

3 The outcomes analysis was then conducted using permutation tests where the inverse of the predicted probabilities from the logit models were applied as weights.

CONTROLLING FOR GENDER

The child's gender was controlled for in all analyses as: i) there were more girls than boys in the overall sample, ii) there were significantly more boys in the high treatment group compared to the low treatment group, and iii) due to evidence on differing developmental trajectories of boys and girls.

How to Interpret the *PFL* Results

The following information is included in the results tables presented in Chapters 2 to 6. These tables are a useful reference for interpreting the results.

Table 1.2 - *Information included in the Results Tables on Impact of PFL during the Programme*

✓	There was a statistically significant favourable impact of the *PFL* programme, which means that the high treatment group were faring better than the low treatment group
✗	There was no statistically significant impact of the *PFL* programme, in that children in both groups were faring similarly
−	There was a statistically significant unfavourable impact of the *PFL* programme, which means that the high treatment group were faring worse than the low treatment group

Table 1.3 - *Information included in the Results Tables on Impact of PFL at School Entry*

N	N represents the number of participants included in the analysis
M	M is the mean, or average value, of responses. This statistic represents the average response of all participants who answered the question of interest. For binary variables (e.g. On Track/Not on Track), this value can be interpreted as the proportion of the sample who reported being in the category described
SD	SD is the standard deviation. It serves as a useful indicator of how varied the responses were
Low/High	Low/High subscripts attached to the summary statistics (N, M, and SD) indicate the groups for which the summary statistics have been calculated
Statistical Difference *p*	The one-tailed *p*-value represents the probability of observing differences between the two groups by chance. In cases where there is a statistically significant difference between the two groups, a *p*-value is presented which indicates the likelihood that the group difference could have randomly occurred. A *p*-value of less than 0.10 is considered to be statistically significant and conveys that the probability of the difference being due to chance is less than 10%. Similarly, *p*-values of less than 0.05 and 0.01 indicate that the probability of the difference between the two groups being due to chance is less than 5%, or 1% respectively. Low *p*-values (i.e., significant results) indicate that the high treatment group was doing better than the low treatment group. *p*-values are presented for positive significant differences only. Differences that are significant in the non-hypothesised direction are denoted by s~. Non-significant differences are denoted by 'ns'
Effect Size *d* and OR	The effect size (*d* and OR) represents the magnitude or the size of the difference between the groups. While the *p*-value allows the reader to determine whether or not there is a statistically significant difference between the groups, it does not indicate the strength of the difference. As the strength of a relationship can provide valuable information, effect sizes were calculated using Cohen's *d* for continuous variables and Odds Ratios (OR) for binary variables. Cohen's *d* from 0.0 to 0.2 is considered small, 0.2 to 0.8 medium, and greater than 0.8 large. An odds ratio >1 indicates that the reference group have higher odds of scoring in that category. An odds ratio less than 1 indicates that the reference group of children have lower odds of scoring in that category. The reference group is denoted in each results table, and differed between the high and low treatment groups depending on the hypothesised direction of the effect.

Chapter Two

Cognitive Development

This chapter explores whether the *PFL* programme improved children's cognitive development. It summarises the impact of *PFL* on children's cognitive development up to 48 months and presents new findings on the programme's impact at school entry.

2.1 What is cognitive development?

Cognitive development is the ability to use complex mental processes like thinking, reasoning, remembering, and understanding (Bjorklund, 2004). Children's cognitive development is an essential part of their school readiness as these skills are vitally important for learning, problem solving, and navigating social interactions (Rimm-Kaufman & Pianta, 2000). It reflects children's overall ability to think logically, make decisions, and learn, as well as their ability to reason and problem solve. Children use their cognitive skills to memorise new information and class rules, and process information to solve problems (Fletcher, 2011). The school environment places new demands on children's cognitive ability as it is very different from their experiences of being at home or in pre-school. The emerging cognitive skills of school age children are a vital part of successfully adapting to the school environment (Rimm-Kaufman & Pianta, 2000).

CHILDREN WHO ARE COGNITIVELY READY FOR SCHOOL

A child who is cognitively ready for school is familiar with letters, shapes, and numbers. They are starting to recognise patterns and structure, for example, they can group objects of a similar type or identify similarities and differences between objects. These children are better at reading, writing, and maths and they do better in academic tests of achievement in later school years.

CHILDREN WHO ARE NOT COGNITIVELY READY FOR SCHOOL

A child who is not cognitively ready for school has difficulty working with letters, shapes, and numbers. These children struggle to understand new information, solve problems, think logically, or learn from their classroom activities. They may need extra classroom supports and are less likely to do well academically. They are more likely to need to repeat a school year and are more likely to experience problem behaviours.

2.2 Do home visiting programmes improve children's cognitive development?

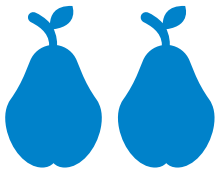
Evidence of a positive impact of home visiting programmes on children's cognitive development before starting school is limited. Only a small number of studies have found favourable intervention effects during the early years, including the Healthy Families America programme at 12 and 24 months (Caldera et al., 2007; Landsverk et al., 2002), and the Early Head Start programme at 36 months (Roggman, Boyce & Cook, 2009). At school age, between the ages of 4 and 5, Drazen & Haust (1993) found that fewer children in receipt of the Parents as Teachers intervention were average or below average in their mental processing. Similarly, Olds, Kitzman, et al. (2004) found that children in the Nurse Family Partnership

programme had better cognitive functioning at age 6 (d=0.18). However, other studies of Nurse Family Partnership and Early Head Start found no impact on children's cognitive skills (Jones Harden, Chazan-Cohen, Raikes, & Vogel, 2012; Olds, Henderson, & Kitzman, 1994). On average, previous home visiting programmes have had a small to medium, positive impact on children's cognitive development (Filene et al., 2013; Gomby, 2005; Sweet & Appelbaum, 2004). However, the results are mixed and there is much variation in the effect sizes found by different programmes (Filene et al., 2013).

2.3 Did *PFL* improve cognitive development during the programme?

2.3.1 How we measured it

We have gathered data on children's cognitive development since they were 12 months old. We asked mothers about their children's cognitive development using the Developmental Profile 3: Cognitive section (DP-3; Alpern, 2007). Figure 2.1 describes this measure.



Developmental Profile 3 (DP3) assessed child's ability to successfully complete tasks requiring cognitive skills, e.g., pointing to a named body part or grouping objects by colour, shape, or size. It measured children's overall cognitive development and identified those who scored above average.

Figure 2.1 - *Measure of Cognitive Development during the Programme*

2.3.2 What we found

Table 2.1. *Impact of PFL on Cognitive Development at Each Assessment.*

Area Assessed	Measure	Age in Months at Assessment 6	12	18	24	36	48
General Cognitive Functioning							
	DP-3 standardised score		⊗	✓	✓	✓	✓
	DP-3 above average		⊗	⊗	✓	✓	✓

What *PFL* Changed

At 6 months	Not assessed
At 12 months	No significant effects
At 18 months	**High treatment children:** • had better cognitive development scores
At 24 months	**High treatment children:** • had better cognitive development scores • were more likely to score above average
At 36 months	**High treatment children:** • had better cognitive development scores • were more likely to score above average
At 48 months	**High treatment children:** • had better cognitive development scores • were more likely to score above average

Figure 2.2 - *Key Impacts on Cognitive Development during the Programme*

2.4 Did *PFL* improve cognitive development at school entry?

2.4.1 How we measured it

Information on cognitive development was gathered by direct assessment of the children at age 4 by the researchers using the British Ability Scales II: Early Years Battery (BAS II; Elliott et al., 1997) and teacher reports when children were in Junior Infants using the Short Early Development Instrument (S-EDI; Janus et al., 2005). Figures 2.3 and 2.4 describe these measures.

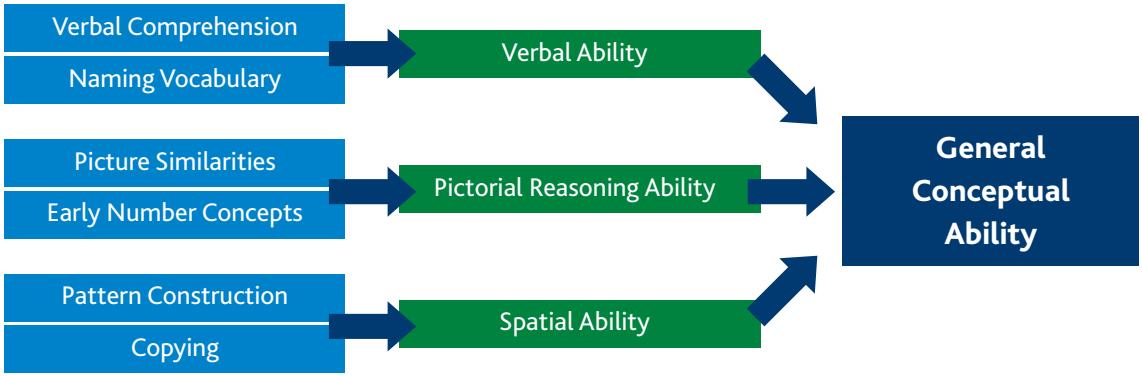


Figure 2.3 - *Design of the BAS II*

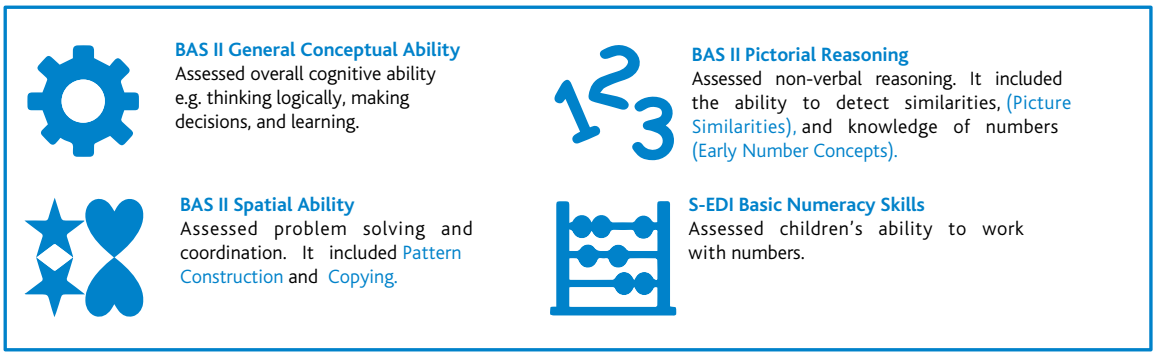


Figure 2.4 - *Measures of Cognitive Development at School Entry*

2.4.2 What we found

Table 2.2 shows the average cognitive development scores for the high and low treatment children. Higher scores indicate that the children had better ability. Overall, the *PFL* programme had a large and statistically significant impact on children's cognitive development.

Children in the high treatment group scored significantly better on all seven direct assessment measures of cognitive development. High treatment children were better at pattern construction, early number concepts, copying, and picture similarities. This means they had better pictorial reasoning skills, spatial ability, and overall cognitive abilities.

Table 2.2 also shows the proportion of children in the high and low treatment groups who scored below and above average in terms of their spatial ability, pictorial reasoning ability, and overall cognitive ability.

The high treatment group were significantly less likely to score below average across all types of cognitive skills. A similar pattern emerged for the proportions of children scoring above average, with the high treatment group being significantly more likely to score above average in their pictorial reasoning skills and overall cognitive ability. There were no significant differences between the two groups in the proportions of children scoring above average in their spatial ability.

The average scores for the high and low treatment children's ability to work with numbers, according to teacher reports, are also shown in Table 2.2. Higher scores indicate that children had better numeracy skills. Children in the high treatment group scored significantly better in relation to basic numeracy skills. They were also less likely to be rated as 'not on track' in their numeracy skills compared to school peers. This means more low treatment children were not ready for school in their ability to work with numbers.

Table 2.2. *Impact of PFL on Cognitive Development at School Entry*

Variable	N	n_{HIGH}/ n_{LOW}	M_{HIGH}	(SD)	M_{LOW}	(SD)	Statistical Difference *p*	Effect[1] Size
BAS Subscales: T-Scores								
Pattern Construction	130	(69/61)	49.51	(12.82)	41.75	(10.98)	$p<.01$	0.65[a]
Copying	130	(70/60)	45.93	(9.86)	41.92	(10.03)	$p<.01$	0.40[a]
Early Number Concepts	132	(71/61)	48.27	(8.41)	43.24	(8.09)	$p<.01$	0.61[a]
Picture Similarities	134	(71/63)	51.51	(9.39)	49.59	(7.74)	$p<.10$	0.22[a]
BAS GCA & Upper Level Clusters Standard Scores								
General Conceptual Ability	128	(69/59)	97.73	(14.37)	88.00	(12.59)	$p<.01$	0.72[a]
Spatial Ability	129	(69/60)	95.96	(17.02)	85.95	(15.31)	$p<.01$	0.62[a]
Pictorial Reasoning	132	(71/61)	99.23	(12.94)	93.15	(10.87)	$p<.01$	0.51[a]
BAS Below Average								
*General Conceptual Ability	128	(69/59)	0.20	(0.40)	0.60	(0.49)	$p<.01$	6.03[b,c]
*Spatial Ability	129	(69/60)	0.31	(0.47)	0.60	(0.49)	$p<.01$	3.29[b,c]
*Pictorial Reasoning	132	(71/61)	0.18	(0.46)	0.46	(0.50)	$p<.05$	2.04[b,c]
BAS Above Average								
General Conceptual Ability	128	(69/59)	0.25	(0.44)	0.08	(0.27)	$p<.05$	3.95[b,d]
Spatial Ability	129	(69/60)	0.14	(0.35)	0.09	(0.29)	ns	1.58[b,d]
Pictorial Reasoning	132	(71/61)	0.17	(0.38)	0.09	(0.29)	$p<.10$	2.05[b,d]
Teacher Reported Numeracy Skills								
S-EDI Basic Numeracy Skills	138	(69/69)	2.64	(2.56)	1.85	(2.24)	$p<.05$	0.33[a]
*S-EDI Basic Numeracy Skills 'Not on Track'	138	(69/69)	0.38	(0.49)	0.56	(0.50)	$p<.05$	2.06[b,c]

Notes: ** indicates higher scores are a negative outcome. [1]Effect sizes (a) are Cohen's d and (b) are odds ratios. For odds ratios, the reference group in (c) were the low treatment group and in (d) were the high treatment group.*

2.5 Summary

Interviews with the *PFL* children during their first year of school indicated that they associated learning with play. They talked about play as an enjoyable activity that seemed to provide them with the opportunity to practice their cognitive skills. These qualitative findings provided important contextual information for the impact evaluation which found that the *PFL* programme had a notable effect on children's cognitive development from 12 months until they started school. This positive impact was consistent across reports from mothers, teachers, and direct assessments of the children. The *PFL* programme not only improved cognitive development, it also increased the number of children scoring above average on these tests, and reduced the number scoring below average. These results are consistent with the literature which finds that home visiting programmes can improve children's cognitive outcomes (Filene et al., 2013; Gomby, 2005; Sweet & Appelbaum, 2004). Yet, the size of the effects seen in the *PFL* sample were generally much larger in magnitude than those reported in previous meta-analyses.

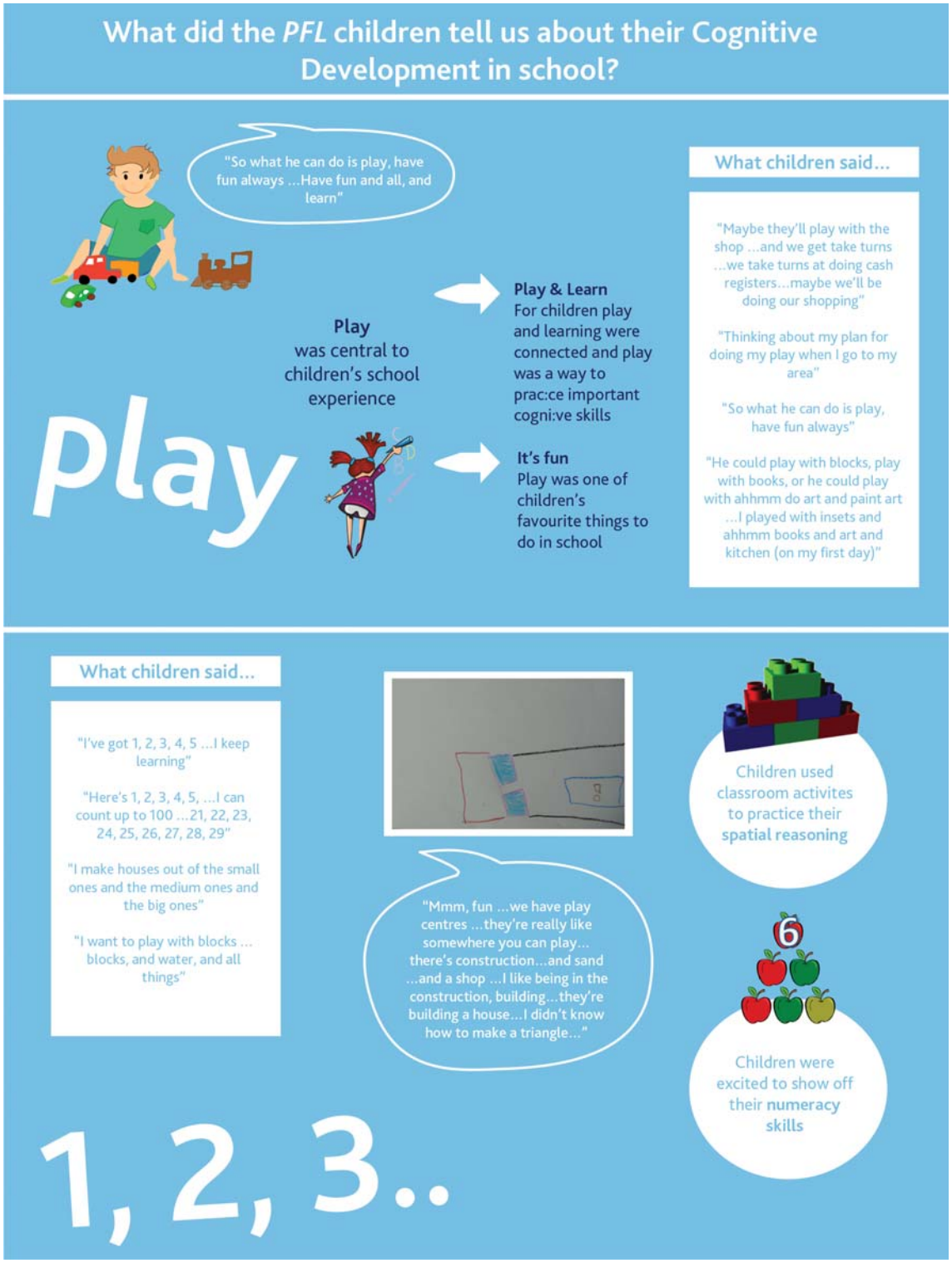


Figure 2.5 - *Qualitative Results on Cognitive Development from Interviews with Children*

Chapter Three

Language Development

This chapter explores whether the *PFL* programme improved children's language development. It summarises the impact of *PFL* on children's language up to 48 months and presents new findings on the programme's impact at school entry.

3.1 What is language development?

Language development refers to children's emerging skills in reading and writing as well as their ability to speak and communicate. It reflects their ability to combine these skills so that they can learn and engage with others (Whitehead, 2002). Children's language development helps them to understand the use and meaning of letters and writing, and to make sense of stories. This is important for their academic learning, but it also helps them to understand what their teachers and peers are saying to them and to express their own thoughts and feelings (Dockett, Perry, & Tracey, 2000; Janus & Offord, 2000; Kagan et al., 1995). It also eases the transition to school if children start with the necessary skills to communicate with others and make sense of what they are hearing.

CHILDREN WHO HAVE THE LANGUAGE SKILLS NEEDED TO START SCHOOL

A child who has good language skills starting school can use words to communicate their experiences, ideas, wishes, and feelings in a way that can be understood by others. They can tell stories in a logical way and understand stories told by others. They can also understand instructions and other types of verbal communication from adults and other children. These children will it easier to get along with friends and have better academic outcomes as they progress through school.

CHILDREN WHO DO NOT HAVE GOOD LANGUAGE SKILLS AT SCHOOL ENTRY

A child who does not have good language skills starting school finds it difficult to speak to and communicate with others. They may also find it difficult to listen and understand in class. These children can struggle with reading, find it hard to mix with others, and are also more likely to experience emotional and behavioural problems. Children who start school with language difficulties usually have lower literacy rates and poorer academic outcomes.

3.2 Do home visiting programmes improve children's language development?

Between infancy and toddlerhood, several studies of home visiting programmes have found favourable effects. Programmes such as Healthy Steps have reported improvements in children's vocabulary and their ability to combine words at 30 months (Johnston, Huebner, Anderson, Tyll, & Thompson, 2006 [d=0.03]); Home Instruction for Parents of Preschool Youngsters (HIPPY) reported improved vocabulary in 3 to 5 year old children after 15 weeks of programme implementation (Necoechea, 2007 [d=0.34]); and Child First reports a reduction in children's risk of language problems at 6 and 12 months (Lowell, Carter, Godoy,

Paulicin, & Briggs-Gowan, 2011 [*d*=0.46 & 0.88]; Necoechea, 2007 [*d*=0.34]). However, studies examining the impact of home visiting programmes on language development at school entry, including HIPPY, Early Head Start, and the Mother-Child Home Program, have found no effects (Baker & Piotrkowski, 1996; Jones Harden et al., 2012; Madden, O'Hara, & Levenstein, 1984). Exceptions to this include studies of the Parents as Teachers programme and the Nurse Family Partnership. At age four to five, Drazen & Haust (1993) found that children who received the Parents as Teachers intervention had better overall language development (*d*=0.57), and were less likely to have language abilities below those expected for their age (*d*=0.80). Likewise, Olds, Kitzman et al. (2004) found that, at age six, children who had received the Nurse Family Partnership intervention had better receptive vocabulary (*d*=0.17), meaning they were better able to recognise and understand spoken words. Overall, the evidence is mixed as to whether home visiting programmes have an impact on children's language development by school entry.

3.3 Did *PFL* improve language development during the programme?

3.3.1 How we measured it

We have gathered data on children's language development since they were 6 months old. We asked mothers about their children's language using two standardised measures: the Ages and Stages Questionnaire: Communication subdomain (ASQ; Squires, Potter, & Bricker, 1999) and the MacArthur-Bates Communicative Development Inventories: Words and Gestures (CDI-WG; Fenson et al., 2000). Figure 3.1 describes these measures.

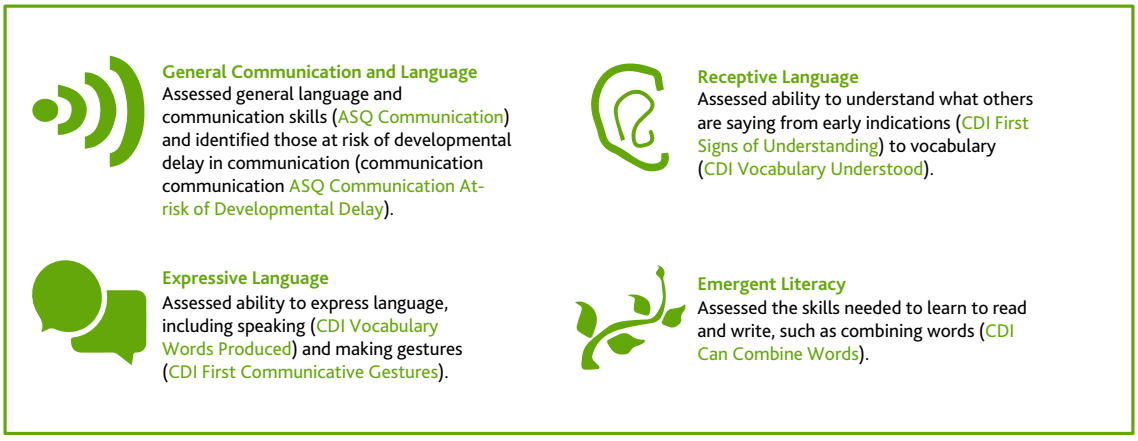


Figure 3.1 - *Measures of Language Development during the Programme*

3.3.2 What we found

Table 3.1. *Impact of PFL on Language Development at Each Assessment*

Area Assessed	Measure	Age in Months at Assessment 6	12	18	24	36	48
General Communication and Language							
	ASQ Communication & Language	⊗	⊗	⊗	⊗	✓	⊗
	ASQ Communication At-risk of Developmental Delay	⊗	⊗	⊗	⊗	⊗	⊗
Expressive Language							
	CDI First communicative gestures		⊗	⊗			
	CDI Vocabulary words produced		⊗	⊗	⊗		
Receptive Language							
	CDI First signs of understanding		⊗	⊗			
	CDI Vocabulary understood		⊗	⊗			
Emergent Literacy							
	CDI Can combine words			⊗	✓		

What *PFL* Changed

At 6 months	No significant effects
At 12 months	No significant effects
At 18 months	No significant effects
At 24 months	**High treatment children:** • were better at combining words
At 36 months	**High treatment children:** • had better communication and language skills
At 48 months	No significant effects

Figure 3.2 - *Language Development during the Programme*

3.4 Did *PFL* improve language development at school entry?

3.4.1 How we measured it

We gathered information on language development using direct assessment of the children at age 4 by the researchers and teacher reports when children were in Junior Infants. Three scales from the BAS II (Elliot et al., 1997) were used to directly assess children's language development. In addition, three subsets of questions from the S-EDI (Janus et al., 2005) and as one set of questions developed by the researchers (CPSE; *PFL* Evaluation Team, 2008) assessed language development according to the Junior Infant teachers. Figure 3.3 describes these measures.

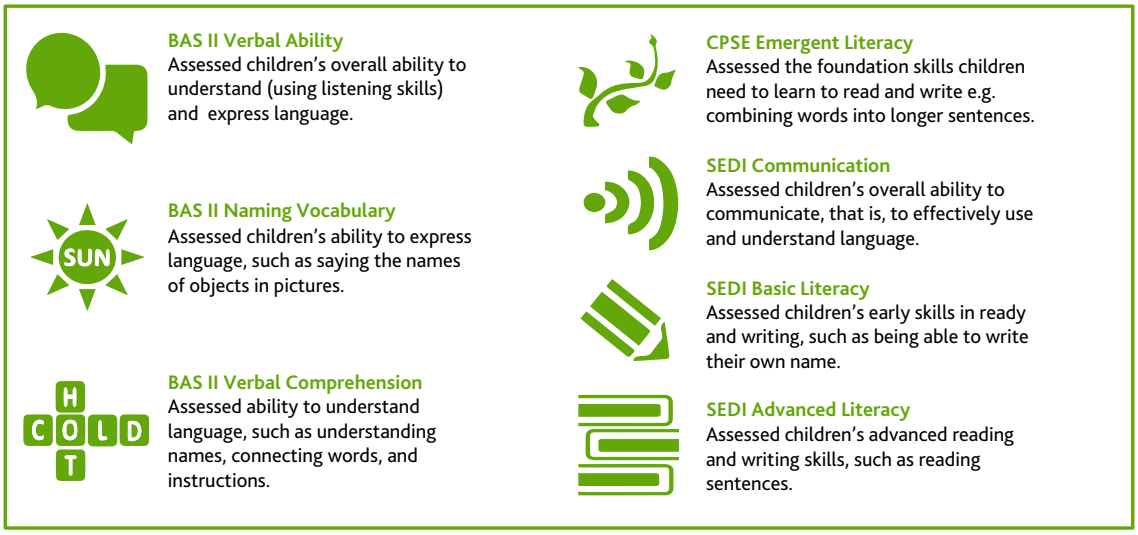


Figure 3.3 - *Measures of Language Development at School Entry*

3.4.2 What we found

Table 3.2 shows the average verbal ability scores for the high and low treatment children. Higher average scores indicate that children had better ability. The table also shows the proportion of children in both groups who scored above and below average in terms of their verbal ability. Overall, the PFL programme had large and statistically significant impacts on children's language development in certain key areas.

The results show that children in the high treatment group scored significantly better in terms of their vocabulary and their ability to understand verbal instructions. The high treatment group also scored significantly better in terms of their overall verbal ability. Children in the high treatment group were less likely to score below average on the verbal ability scale, and were more likely to score above average.

Table 3.2 also shows the teacher-reported average communication and literacy scores for the high and low treatment children, as well as the proportion of children who were 'not on track' in their communication and literacy skills when compared to their school peers. The high treatment group had significantly better communication skills, yet there were no significant differences between the high and low treatment groups in relation to their average scores on emerging, basic, or advanced literacy skills. Children in the high treatment group were significantly less likely to be rated as 'not on track' in terms of their communication and emerging literacy skills. This means that more children in the low treatment group were not ready for school in these areas. There were no significant differences between the proportion of high and low treatment children rated 'not on track' in their basic or advanced literacy skills.

Table 3.2. *Impact of PFL on Language Development at School Entry*

Variable	N	n_{HIGH}/ n_{LOW}	M_{HIGH}	(SD)	M_{LOW}	(SD)	Statistical Difference *p*	Effect[1] Size
BAS Verbal Ability Subscales: T-Scores								
Naming Vocabulary	134	(71/63)	53.29	(11.20)	45.95	(11.24)	$p<.01$	0.65[a]
Verbal Comprehension	134	(71/63)	44.66	(6.78)	42.13	(6.84)	$p<.05$	0.37[a]
BAS Verbal Ability Cluster								
Verbal Ability Cluster Standard Score	134	(71/63)	98.60	(13.09)	90.28	(12.35)	$p<.01$	0.65[a]
*Verbal Ability Below Average	134	(71/63)	0.26	(0.37)	0.46	(0.50)	$p<.05$	3.53[b,c]
Verbal Ability Above Average	134	(71/63)	0.25	(0.43)	0.08	(0.27)	$p<.05$	3.81[b,d]
Teacher Reported Communication and Literacy Total Scores								
CPSE Emerging Literacy Skills	149	(75/74)	1.78	(0.29)	1.73	(0.28)	ns	0.17[a]
S-EDI Communication	148	(75/73)	6.82	(3.26)	5.39	(3.79)	$p<.01$	0.41[a]
S-EDI Basic Literacy Skills	149	(75/74)	8.08	(2.84)	7.58	(3.01)	ns	0.17[a]
S-EDI Advanced Literacy Skills	127	(64/63)	6.91	(3.77)	6.77	(3.70)	ns	0.04[a]
Teacher-Reported Communication and Literacy 'Not on Track'								
*CPSE Emerging Literacy Skills	149	(75/74)	0.22	(0.42)	0.34	(0.48)	$p<.10$	1.83[b,c]
*S-EDI Communication	148	(75/73)	0.21	(0.41)	0.39	(0.49)	$p<.05$	2.40[b,c]
*S-EDI Basic Literacy Skills	149	(75/74)	0.11	(0.31)	0.16	(0.37)	ns	1.60[b,c]
*S-EDI Advanced Literacy Skills	127	(64/63)	0.14	(0.34)	0.11	(0.32)	ns	0.81[b,c]

Notes: ** indicates higher scores are a negative outcome. [1] Effect sizes (a) are Cohen's d and (b) are odds ratios. For odds ratios, the reference group in (c) were the low treatment group and in (d) were the high treatment group.*

3.5 Summary

Interviews with the *PFL* children in their first year of school demonstrated the importance that children place on language development when starting school. Although they found some aspects of learning to read and write difficult, the children had a rich vocabulary and were enthusiastic to demonstrate their emerging abilities. These qualitative findings highlighted areas of importance for children and aids the interpretation of the quantitative results. The impact evaluation found that *PFL* had an effect on some areas of children's language development by school entry. The direct assessment of children's skills found that the programme had improved children's ability to use and understand language. Parents and teachers also reported positive impacts on children's communication skills and emerging literacy skills. However, the results suggest that the *PFL* programme had no impact on children's basic or advanced literacy skills. These results are consistent with other evaluations of home visiting programmes which have found mixed impacts of home visiting on children's language development (see Baker & Piotrkowski, 1996; Drazen & Haust, 1993; Jones Harden et al., 2012; Madden et al., 1984, Olds, Kitzman, et al., 2004). The evaluations which have found positive impacts on language development at school age largely report medium effect sizes (*d* range = 0.17-0.57), which is in keeping with the effect sizes found here.

Figure 3.4 - *Qualitative Results on Language Development from Interviews with Children*

Chapter Four

Approaches to Learning

This chapter explores whether the *PFL* programme improved how children approach learning. It summarises the impact of *PFL* on children's approach to learning up to 48 months and presents new findings on the programme's impact at school entry.

4.1 What are approaches to learning?

A child's approach to learning is a measure of whether they are open to and interested in new tasks and whether they are motivated to take part in learning activities. It also measures their ability to persist at tasks and cooperate with classmates even in the face of frustrations and distractions (Emig et al., 2000; Li-Grining, Votruba-Drzal, Maldonado-Carreño, & Haas, 2010). This requires children to exercise effortful control: to show a reasonable level of control of their feelings and behaviours in response to what they are experiencing in their world. At school entry, a child's ability to learn from classroom activities and interactions will depend on the behaviours they use to approach learning. To truly benefit from the opportunities school has to offer, a child needs to be enthusiastic about learning and actively participate in classroom tasks (Hyson, 2008).

CHILDREN WHO HAVE A POSITIVE APPROACH TO LEARNING AT SCHOOL ENTRY

A child who has a positive approach to learning is excited to learn, eager to participate in classroom activities, can initiate tasks, and see tasks through to the end despite any challenges faced. Children demonstrating such learning behaviours in early life will be more successful academically and better socially adjusted to the classroom.

CHILDREN WHO HAVE A POOR APPROACH TO LEARNING AT SCHOOL ENTRY

A child with a poor approach to learning is not curious, motivated, or keen to learn, and is unable to stay focussed on learning tasks in the classroom. These children may experience problems with classmates, and in later years have poorer academic achievement, issues with social and emotional adjustment, and poorer school attendance.

4.2 Do home visiting programmes improve children's approaches to development?

The impact of home visiting programmes on children's approaches to learning has rarely been explicitly considered in programme evaluations. To date, no studies have examined this concept for children under the age of 3. From age 3 until school entry a number of studies have shown positive impacts on some areas of children's approaches to learning. The Parents as Teachers programme improved approaches to learning at age 3 in two separate studies. Wagner, Clayton, Gerlach-Downie, and McElroy (1999) found a positive impact on self-help behaviours (d=0.25) and Drotar, Robinson, Jeavons, & Lester Kirchner (2009) found that children who received home visiting were more likely to persist at problem solving and new tasks

(*d*=0.20). Children who participated in Early Head Start – Home Visiting (EHS-HV) were more engaged during play at age 3, and at age 5 showed more positive approaches to learning (Jones Harden et al., 2012 [*d*=0.19-0.20]). At ages 6 to 7, the Healthy Families New York programme had a positive impact on children's behaviours which promote learning (Kirkland & Mitchell-Herzfeld, 2012 [*d*=0.36]). While the impact of the Nurse Family Partnership programme on children' executive functioning skills and engagement in classroom tasks was evaluated, no significant effects were found (Olds, Kitzman, et al., 2004; Olds, Robinson, et al., 2004. Overall, these studies suggest that home visiting programmes can have a positive, but limited, impact on children's approaches to learning.

4.3 Did *PFL* improve approaches to learning during the programme?

4.3.1 How we measured it

ASQ Problem Solving and Personal Social Skills

A combination measure that assessed children's learning behaviours through how they explore the world, learn with toys, play, and their motivation to meet their own needs in self-feeding and dressing independently.

***Figure 4.1** - Measures of Approaches to Learning during the Programme*

4.3.2 What we found

Table 4.1. *Impact on Approaches to Learning at Each Assessment*

Area Assessed	Measure	Age in Months at Assessment					
		6	12	18	24	36	48
General Approaches to Learning							
	ASQ Problem Solving and Personal-Social Skills Score	⊗	⊗	⊗	⊗	✓	✓

What *PFL* Changed

 At 6 months	No significant effects
 At 12 months	No significant effects
 At 18 months	No significant effects
 At 24 months	No significant effects
 At 36 months	**High treatment group:** • showed better learning behaviours
 At 48 months	**High treatment group:** • showed better learning behaviours

Figure 4.2 - Key Impacts on Approaches to Learning during the Programme

4.4 Did *PFL* improve approaches to learning at school entry?

4.4.1 How we measured it

Information on approaches to learning was gathered using direct assessment of the children by the researchers and teacher reports when the children were in Junior Infants. The direct assessment used a modified version of the day/night task (Gerstadt et al., 1994; Kochanska et al., 2007) and the delay of gratification task (Mischel et al., 1989). Teacher reports were gathered using three subscales from the S-EDI (Janus et al., 2005). These measures are described in Figure 4.3.

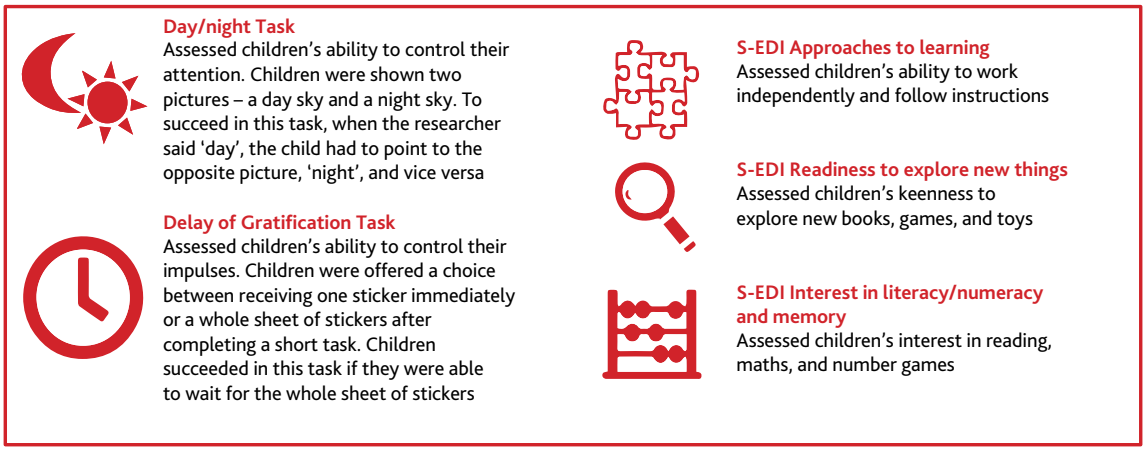


Figure 4.3 - *Measures of Approaches to Learning at School Entry*

4.4.2 What we found

Overall, the *PFL* programme had one effect on children's approaches to learning. The results in Table 4.2 show that children in the high treatment group performed significantly better on the day/night task which means they were more able to control their attention than the low treatment group. However, the proportion of children in both groups who succeeded in the delay of gratification task did not differ statistically. This means that they were equally as likely to wait for the book of stickers.

Table 4.2 also shows the average scores of the high and low treatment groups on their approaches to learning according to their teacher, and the proportion of children rated 'not on track' compared to other school peers. Children in the two groups did not significantly differ on their approaches to learning, readiness to explore new things, or interest in literacy, numeracy, and memory. There were also no significant differences on the proportion of children 'not on track' on any of these approaches to learning measures. Of note, no children in either group were rated as 'not on track' in their interest in literacy, numeracy, and memory.

Table 4.2. *Impact of PFL on Approaches to Learning at School Entry*

Variable	N	n_{HIGH}/ n_{LOW}	M_{HIGH}	(SD)	M_{LOW}	(SD)	Statistical Difference *p*	Effect[1] Size
Tasks for Controlling Attention and Impulsive Behaviour								
Day/Night Task Total Score	117	(63/54)	21.95	(6.38)	19.17	(5.90)	$p<.05$	0.45[a]
% Who Delayed Gratification	129	(68/61)	0.75	(0.44)	0.72	(0.45)	ns	1.13[b,d]
Teacher Reported Approaches to Learning Total Scores								
S-EDI Approaches to Learning	149	(75/74)	8.21	(2.43)	8.04	(2.44)	ns	0.07[a]
S-EDI Readiness to Explore New Things	148	(75/73)	8.96	(1.83)	8.64	(1.87)	ns	0.18[a]
S-EDI Interest in Literacy, Numeracy, & Memory	148	(75/73)	9.06	(2.53)	9.05	(1.79)	ns	0.01[a]
Teacher Reported Approaches to Learning 'Not on Track'								
*S-EDI Approaches to Learning	149	(75/74)	0.17	(0.38)	0.16	(0.37)	ns	0.95[b,c]
*S-EDI Readiness to Explore New Things	148	(75/73)	0.18	(0.39)	0.26	(0.44)	ns	1.63[b,c]
*S-EDI Interest in Literacy, Numeracy, & Memory	148	(75/73)	0.00	(0.00)	0.00	(0.00)	~	~

Notes: ** indicates higher scores are a negative outcome. [1]Effect sizes (a) are Cohen's d and (b) are odds ratios. For odds ratios, the reference group in (c) were the low treatment group and in (d) were the high treatment group.*

4.5 Summary

Children in the *PFL* sample had very positive views about school. In their descriptions they indicated that they had a strong appetite for learning, took pride in their achievements, knew the routine of the school day, and used their imaginations to think creatively. However, the evaluation results show that the *PFL* programme had a limited impact on how children approached learning. Parents did report a positive impact on some learning behaviours during the programme, and the direct assessment of children showed a positive impact on children's ability to manage their attention. However, teacher reports did not show any impact of the *PFL* programme on children's approaches to learning. This positive, but limited, impact on children's approaches to learning is consistent with evaluations of other home visiting programmes.

What did the *PFL* children tell us about their Approaches to Learning in school?

Most children had **very positive** views about school

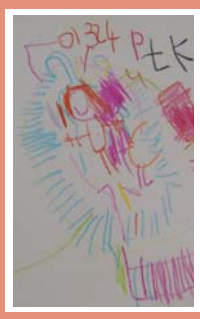
What children said…

"I wish I could go to school everyday"

"It's fun …because you get to play…fun… fun…'cause we have friends"

"I love school"

"He could find that work is a little hard … and then he gets very good at it …he can do anything in school"



"I've got 1, 2, 3, 4, 5…I know how to spell my sister's name, will I do it?…I'm gonna write my name…I keep learning…"

"..Cats that can fly….The cats keep all their jewellery in their wings…."

learning

Children had an **appetite for learning**

- Children generally found **creative and imaginative activities easy**
- **Academic aspects** of school can be **challenging**
- Some children saw themselves as **active learners**

Children were **confident** in **and proud** of their achievements

Children know a lot about **how school works**

Children had **rich imaginations** that allow creative ways of thinking

What children said…

"Can I read a book now"

"What's easy is play, playcentre"

"He'll like to work …because you get to colour in …you learn …and play and you get to go out into the yard"

"Ehm I think he would find hard when he doesn't get when he doesn't ehm when he ehm tries to write something' and he can't"

"Cause we have to do lots of work …cause that makes us learn"

Figure 4.4 - *Qualitative Results on Approaches to Learning from Interviews with Children*

Chapter Five

Social and Emotional Development

This chapter explores whether the *PFL* programme improved children's social and emotional development. It summarises the impact of *PFL* on children's social and emotional development up to 48 months and presents new findings on the programme's impact at school entry.

5.1 What is social and emotional development?

A child's social development refers to how well they get on with others and a child's emotional development relates to how they are feeling and how they express their feelings through their behaviour. By the time children start school, they begin to manage their emotions, control inappropriate behaviours, feel empathy, and have positive interactions with other children (Denham, Wyatt, Bassett, Echeverria, & Knox, 2009). In this new environment, without a parent to rely on, children need to use their social and emotional skills to become more independent and responsible. At school entry, a child's learning, relationships with classmates and teachers, and how they cope with the demands of this new, challenging environment will all depend on their social and emotional development. Social and emotional competencies will help children in their learning and relationships, and will help them to achieve a successful transition to school life, while social and emotional difficulties can undermine these important processes and relationships.

CHILDREN WHO ARE SOCIALLY AND EMOTIONALLY READY FOR SCHOOL

A child who is socially and emotionally ready for school is able to sit calmly, pay attention to their teacher, and follow the rules of the classroom. When interacting with other children, they are considerate, helpful, cooperative, and can resolve conflict without starting fights or throwing tantrums. They feel happy and as such, are ready to learn. They are able to manage simple responsibilities like putting on their own coat. These children are more likely to be successful in school life, accepted by classmates, and liked by teachers.

CHILDREN WHO ARE NOT SOCIALLY AND EMOTIONALLY READY FOR SCHOOL

A child who is not socially and emotionally ready for school may experience negative emotions such as sadness or worry (internalising behaviours) or may act out, being aggressive, hyperactive, or disobedient (externalising behaviours). These children are more likely to be rejected by classmates, punished by teachers, and are at risk for poorer academic outcomes.

5.2 Do home visiting programmes improve children's social and emotional development?

Before the age of 3, few studies have found an impact of home visiting programmes on children's social and emotional development. The Nurse Family Partnership reported favourable effects at 6 months old, in that intervention children were less likely to show emotional vulnerability after getting a fright (Olds et al., 2002). Children participating in the Family Partnership Model were more cooperative in their interactions with parents at 12 months (Barlow et al., 2007). A positive impact by the Healthy Families America programme on social and emotional outcomes was found at 24 months. Children receiving the programme showed fewer problematic internalising and externalising behaviours (Caldera et al., 2007

[*d*=0.22-0.40]). However, Wagner et al. (1999) found that children in the Parents as Teachers programme showed poorer social development at 24 months (*d*=-0.24). A large number of home visiting programmes have found favourable impacts on social and emotional development between the ages of 3 and school entry including fewer internalising, externalising, and social problems (Connell et al., 2008; Fergusson, Grant, Horwood, & Ridder, 2005 [*d*=0.24-0.26]; Jones Harden et al., 2012 [*d*=0.15]; Landsverk et al., 2002 [*d*=0.24]; Olds et al., 1994; Olds, Kitzman, et al. (2004) [*d*=0.37]; Shaw, Connell, Dishion, Wilson & Gardner, 2009 [*d*=0.21-0.23]). Landry, Smith, Swank & Guttentag (2008) also found a positive impact of the Play and Learn Strategies (II) programme (PALS II) on children's social competencies in terms of their cooperation (*d*=0.30) and social engagement (*d*=0.32). On average, home visiting programmes have had a modest, but positive, impact on children's social and emotional development (Gomby, 2005; Sweet & Appelbaum, 2004).

5.3 Did *PFL* improve social & emotional development during the programme?

5.3.1 How we measured it

Since the *PFL* children were 6 months old we asked mothers about their children's social and emotional development using five standardised instruments:

- The Ages and Stages Questionnaire: Social-Emotional (ASQ:SE; Squires, Bricker, & Twombly, 2003),
- The Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006),
- The Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000)
- The Infant-Toddler Social and Emotional Assessment (ITSEA; Carter & Briggs-Gowan, 2006), and
- The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).

These measures are described in Figure 5.1.

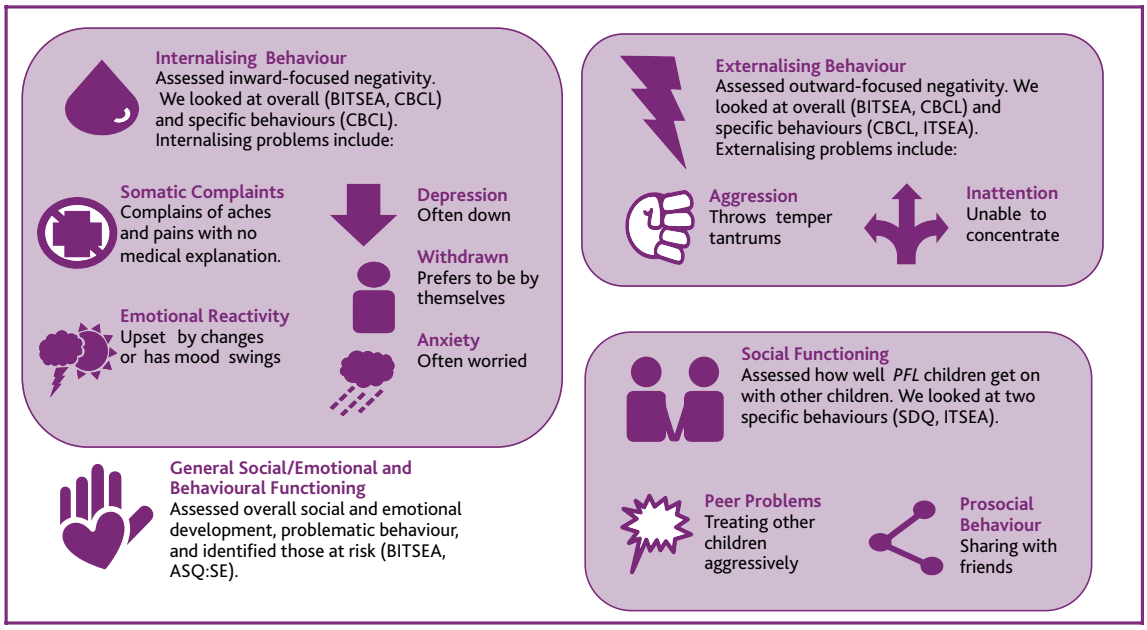


Figure 5.1 - *Measures of Social and Emotional Development during the Programme*

5.3.2 What we found

Table 5.1. *Impact of PFL on Social and Emotional Development at Each Assessment*

Area Assessed	Measure	Age in Months at Assessment					
		6	12	18	24	36	48
Internalising Behaviour							
	BITSEA Internalising Total Score				✓	✗	
	CBCL Internal Problems Total Score				✗	✗	✗
	CBCL Internal Problems Clinical Cut-Off				✓	✗	✓
	CBCL Somatic Complaints Score				✗	✓	✗
	CBCL Withdrawn Score				✗	✗	✗
	CBCL Emotionally Reactive Score				✗	✗	✗
	CBCL Anxious/Depressed Score				✗	✗	✗
Externalising Behaviour							
	BITSEA Externalising Total Score				✗	✗	
	CBCL External Problems Total Score				✗	✓	✓
	CBCL External Problems Clinical Cut-Off				✓	✓	✓
	CBCL Aggressive Behaviours Score				✗	✓	✓
	ITSEA Aggression (with Peers)					✗	
	CBCL Attention Disorders Score				✗	✓	✗
Social Functioning							
	SDQ Peer Problems Score						✗
	ITSEA Prosocial Behaviour with Peers Score					✓	
	SDQ Prosocial Behaviour Score						✓
General Social/Emotional and Behavioural Functioning							
	ASQ:SE Total Score	✗	✗	✗	✗	✗	✗
	ASQ:SE At Risk Cut-Off	✗	✗	✗	✗	✗	✗
	BITSEA Problem Total Score		✗	✗	✓	✗	
	BITSEA Problem At Risk Cut-Off		✗	✗	✓		
	BITSEA Competence Total Score		✗	✗	✗	✗	
	BITSEA Competence Score At Risk Cut-Off		✗	✗	✗		
	CBCL Total Problems Score				✓	✓	✗
	CBCL Total Problems Clinical Cut-Off				✓	✓	✓

What *PFL* Changed

At 6 months	No significant effects
At 12 months	No significant effects
At 18 months	No significant effects
At 24 months	**High treatment children showed:** • fewer social and emotional behavioural problems • fewer internalising problems **High treatment children were less at risk for:** • clinically significant problems • serious internalising problems • serious externalising problems
At 36 months	**High treatment children showed**: • fewer social and emotional behavioural problems • fewer externalising problems • fewer aggressive behaviours • fewer inattentive behaviours • fewer somatic complaints • more prosocial behaviours with peers **High treatment children were less at risk for:** • clinically significant problems • serious externalising problems
At 48 months	**High treatment children showed:** • fewer externalising problems • fewer aggressive behaviours • more prosocial behaviours **High treatment children were less at risk for:** • clinically significant problems • serious internalising • serious externalising problems

Figure 5.2 - *Key Impacts on Social and Emotional Development during the Programme*

5.4 Did *PFL* improve social and emotional development at school entry?

5.4.1 How we measured it

When the *PFL* children were in Junior Infants, their teachers completed questions from the S-EDI (Janus et al., 2005) and from the evaluation team (CPSE; *PFL* Evaluation Team, 2008) about whether they were socially and emotionally ready for school. These measures are described in Figure 5.3.

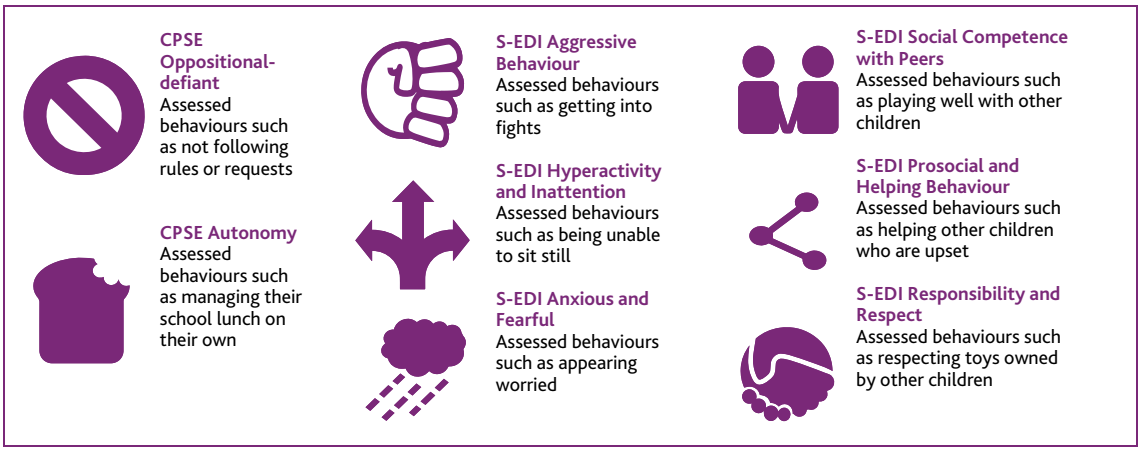


Figure 5.3 - *Measures of Social and Emotional Development at School Entry*

5.4.2 What we found

Table 5.2 shows the average scores for the high and low treatment children. Higher scores indicate that children used more appropriate behaviours. The results show that the high treatment children scored significantly better on hyperactive and inattentive behaviour. There were no significant differences between children on their levels of aggression, anxiety and fearfulness, or oppositional-defiant behaviour, meaning teachers rated the high and low treatment children similarly. There were also no differences between the groups on their prosocial and responsible, respectful behaviours. A positive impact of the programme was found on children's levels of social competence with their peers and their autonomy, with high treatment children scoring significantly better on these measures.

Table 5.2 also shows the proportion of children in the high and low treatment groups who were 'not on track' compared to their school peers in their social and emotional development. Significantly less high treatment children were rated as 'not on track' in their hyperactive and inattentive behaviour, social competence with peers, and their autonomy. This means more low treatment children are not ready for school in these areas. There were no significant differences between the number of children rated 'not on track' for aggressive behaviours, anxiety and fearfulness, oppositional-defiant behaviour, or on their prosocial and responsible, respectful behaviours.

Table 5.2. *Impact of PFL on Social and Emotional Development at School Entry*

Variable	N	n_{HIGH}/ n_{LOW}	M_{HIGH}	(SD)	M_{LOW}	(SD)	Statistical Difference *p*	Effect[1] Size
Teacher Reported Problematic Behaviours Total Scores								
*S-EDI Aggressive Behaviour	147	(73/74)	8.99	(1.81)	8.99	(1.97)	ns	0.001[a]
*S-EDI Hyperactivity & Inattention	147	(74/73)	8.96	(1.75)	7.73	(3.04)	$p<.05$	0.50[a]
*S-EDI Anxious and Fearful Behaviour	149	(75/74)	6.61	(3.41)	6.62	(3.22)	ns	0.00[a]
*CPSE Oppositional-Defiant Behaviour	147	(73/74)	2.73	(0.47)	2.78	(0.47)	ns	0.10[a]
Teacher Reported Positive Behaviours Total Scores								
S-EDI Social Competence with Peers	149	(75/74)	7.51	(2.69)	6.59	(3.25)	$p<.05$	0.31[a]
S-EDI Prosocial & Helping Behaviour	144	(73/71)	5.87	(3.23)	5.60	(3.42)	ns	0.08[a]
S-EDI Responsibility & Respect	149	(75/74)	8.33	(2.59)	8.60	(2.14)	ns	0.12[a]
CPSE Autonomy	149	(75/74)	1.86	(0.27)	1.73	(0.32)	$p<.01$	0.43[a]
Teacher Reported Problematic Behaviours 'Not on Track'								
*S-EDI Aggressive Behaviour	147	(73/74)	0.18	(0.39)	0.20	(0.40)	ns	1.14[b,c]
*S-EDI Hyperactivity & Inattention	147	(74/73)	0.16	(0.37)	0.31	(0.46)	$p<.05$	2.29[b,c]
*S-EDI Anxious & Fearful Behaviour	149	(75/74)	0.22	(0.42)	0.18	(0.39)	ns	0.78[b,c]
*CPSE Oppositional-Defiant Behaviour	147	(73/74)	0.11	(0.31)	0.11	(0.32)	ns	1.04[b,c]
Teacher Reported Positive Behaviours 'Not on Track'								
*S-EDI Social Competence with Peers	149	(75/74)	0.25	(0.43)	0.43	(0.50)	$p<.01$	2.26[b,c]
*S-EDI Prosocial & Helping Behaviour	144	(73/71)	0.33	(0.47)	0.32	(0.47)	ns	0.95[b,c]
*S-EDI Responsibility & Respect	149	(75/74)	0.28	(0.45)	0.19	(0.40)	ns	0.61[b,c]
*CPSE Autonomy	149	(75/74)	0.27	(0.45)	0.51	(0.50)	$p<.01$	2.84[b,c]

Notes: ** indicates higher scores are a negative outcome. [1]Effect sizes (a) are Cohen's D and (b) are odds ratios. For odds ratios, the reference group in (c) were the low treatment group and in (d) were the high treatment group.*

5.5 Summary

Social and emotional skills play a central role in children's early school experience. Children in the *PFL* sample were mostly happy about going to school but some children found the transition difficult. Children used their social and emotional skills to interact with their peers and also indicated that the school's rules and expectations guided how they behaved. These qualitative findings offered important contextual information which can be used to interpret the quantitative results. Reports from mothers up to 48 months indicated that the programme was consistently successful in reducing children's problematic behaviours and improving their prosocial behaviours. Fewer impacts were found at the start of Junior Infants using reports from teachers. However, teachers did report reductions in hyperactivity and inattentive behaviours, and improvements in social competencies and levels of autonomy. The sizes of these effects ranged from 0.31 to 0.50, which compare well with the effect sizes reported by other home visiting programmes. Our results are supported by reviews which find that home visiting programmes do have a positive impact on children's social and emotional development (Gomby, 2005; Sweet & Appelbaum, 2004).

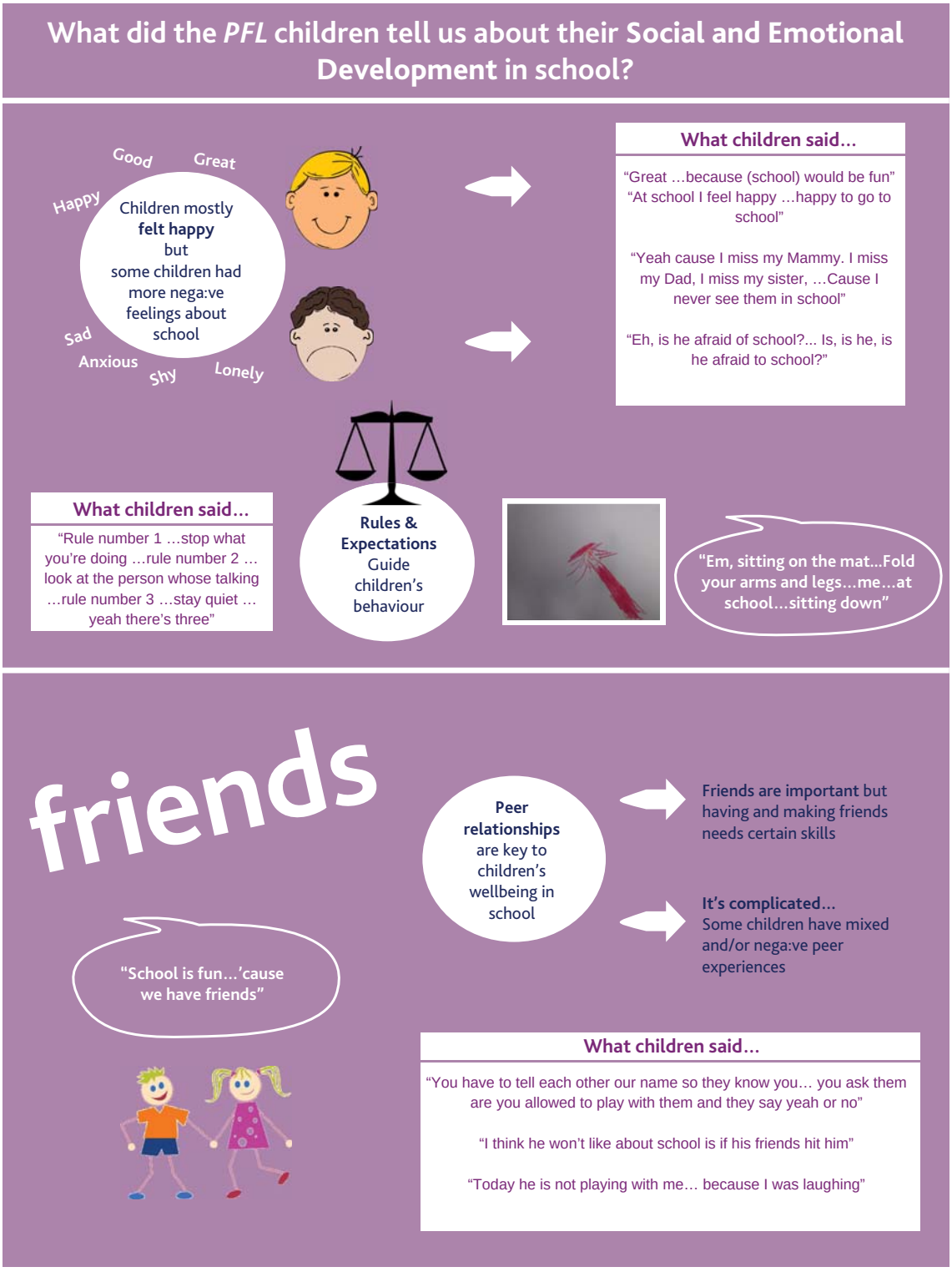


Figure 5.4 - *Qualitative Results on Social and Emotional Development from Interviews with Children*

Chapter Six

Physical Wellbeing & Motor Development

This chapter explores whether the *PFL* programme improved children's physical wellbeing and motor development. It summarises the impact of *PFL* on children's physical wellbeing and motor development up to 48 months and presents new findings on the programme's impact on hospital usage up to 48 months, and on physical wellbeing and motor development at school entry.

6.1 What is physical wellbeing and motor development?

A child's physical wellbeing refers to their general health and fitness. This is influenced by the child's diet, exercise, sleep, immunisations, and illnesses. A child's motor development includes their gross and fine motor skills. Gross motor skills are large body movements like walking, running, or climbing (Sheridan, Sharma, & Cockerill, 2008). Fine motor skills are smaller, precise movements of the hands like holding a cup or turning the pages of a book (Sheridan et al., 2008). A child's ability to fully participate in school life will depend on their physical wellbeing and motor development. The energy a child has to engage in the busy school day will depend on their physical health and fitness. Their ability to take part in physical activities in the playground and draw and write in the classroom will depend on their gross and fine motor skills.

CHILDREN WHO ARE PHYSICALLY READY FOR SCHOOL

A child who is physically ready for school arrives well-fed and full of energy for the day ahead. These children are able to hold a pencil, and run, jump, and climb in the playground. A child who is physically ready for school can go to the toilet by themselves, they have been immunised, and are generally healthy. Children who are physically ready for school adjust better to school life and do better academically.

CHILDREN WHO ARE NOT PHYSICALLY READY FOR SCHOOL

A child who is not physically ready for school may arrive to the classroom hungry and tired. They are not well-coordinated and may trip or fall during physical activities. They find it difficult to firmly hold a pencil and have trouble writing. They are more likely to be absent from school particularly if they are often unwell. A child who is not physically ready for school has difficulty concentrating and learning, finds it harder to adjust to school life, and will have poorer academic achievement in the future.

6.2 Do home visiting programmes improve children's physical wellbeing and motor development?

Evaluations of home visiting programmes have largely relied on health service use to measure children's physical wellbeing. Between infancy and school age, several evaluations, including Early Start New Zealand, Nurse Family Partnership, Resources, Education, and Care in the Home, and Early Intervention Program for Adolescent Mothers, reported improvements in health service use. These studies found fewer doctor, hospital, and emergency room visits, less time in hospital, fewer illnesses and injuries, and more up-to-date immunisations (Barnes-Boyd, Norr, & Nacion, 1996; Fergusson et al., 2005 [*d*=0.20-0.24]; Guyer et al., 2003 [*d*=0.25-0.37]; Johnston, Huebner, Anderson, Tyll, & Thompson, 2006 [*d*=0.02]; Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2003; Olds, Henderson, Chamberlin, & Tatelbaum, 1986). However, no differences were observed using the same or similar measures in many other programmes, including Early Head Start, Healthy Steps, Oklahoma's Community-Based Family Resource and Support Program, and Parents as Teachers (Culp, Culp, Anderson, & Carter, 2007; Love et al., 2002; Minkovitz et al., 2007; Wagner & Clayton, 1999). An evaluation of Nurse Family Partnership reported mixed results at 4 years of age (Olds, Henderson, & Kitzman, 1994). Home visited children had fewer injuries and ingestions, and fewer visits to the emergency department (*d*=0.53), but spent more days in hospital than children who had not been home visited (*d*=0.18).

Other indicators of child health such as general health, weight, and diet are not commonly included in evaluations of home visiting programmes beyond early infancy. Evaluations that measure weight and nutrition report mixed effects, with no impact on birthweight (Barth, 1991; Kitzman et al., 1997; Nguyen, Carson, Parris, & Place, 2003; Olds, Henderson, Tatelbaum, & Chamberlin, 1986), and favourable effects (Kemp et al., 2011 [*d*=0.52]; Kitzman et al., 1997 [*d*=0.37]), unfavourable effects (Johnston et al., 2006]), and no impact (Kemp et al., 2012) on breastfeeding. One evaluation of Healthy Beginnings reported improvements across multiple indicators of early child nutrition including breastfeeding and the introduction of solids at 6 and 12 months (Wen, Baur, Simpson, Rissel, & Flood, 2011 [d=0.10-0.35]), as well as Body Mass Index and vegetable intake at 24 months (Wen et al., 2012 [*d*=0.22-0.35]). A positive impact on motor skills was found in one study by Drazen & Haust (1993), who found that children in the Parents as Teachers programme were less at risk of being delayed in their gross motor skills at ages 4 to 5 (*d*=0.77).

Overall, systematic reviews conclude that home visiting programmes do not appear to improve child health and wellbeing outcomes (Filene et al., 2013; Gomby, 2005). However, there are large differences in findings reported in these reviews, with effect sizes ranging from 0 to 0.22 across programmes (Filene et al., 2013).

6.3 Did *PFL* improve physical wellbeing and motor development during the programme?

6.3.1 How we measured it

We gathered data on children's physical wellbeing and motor development from birth onwards using maternity hospital records, interviews with mothers, and through direct measurement of the children. Figure 6.1 shows the type of information gathered.

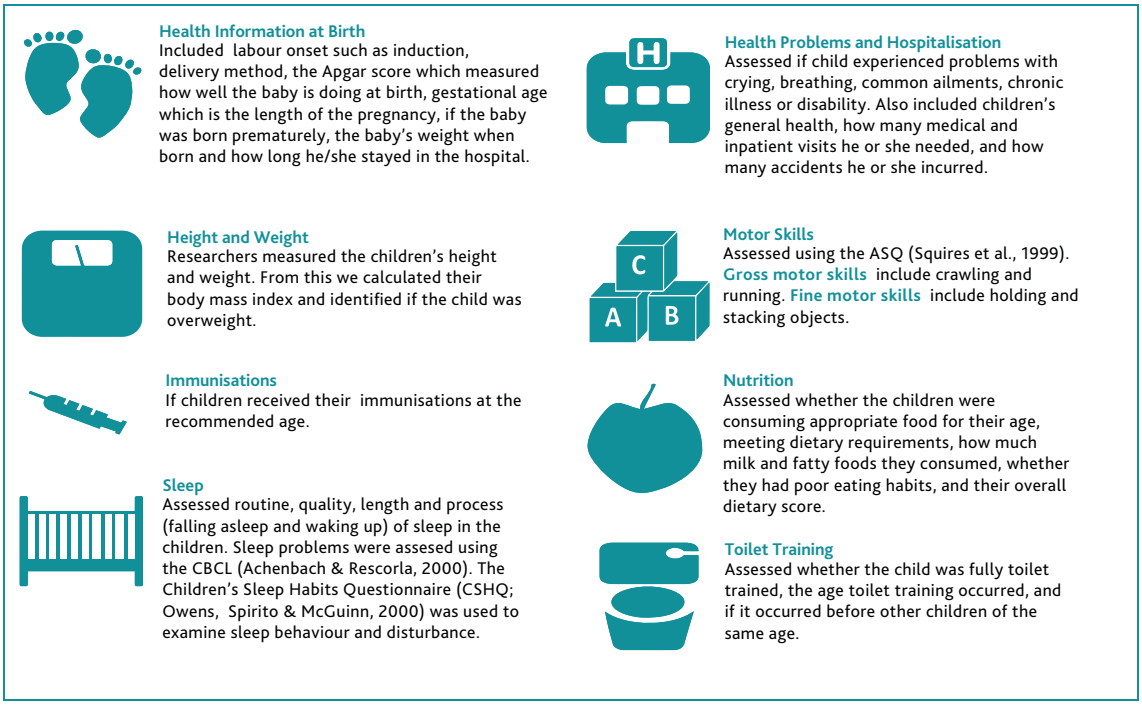


Figure 6.1 - *Measures of Physical Wellbeing and Motor Development during the Programme*

6.3.2 What we found

Table 6.1. *Impact of PFL on Physical Wellbeing and Motor Development at Each Assessment*

Area Assessed	Measure	Age in Months at Assessment						
		0	6	12	18	24	36	48
Health Information at Birth								
	Labour Onset Spontaneous	✓						
	Delivery – Caesarian	✓						
	Delivery – Emergency Caesarian	✓						
	Delivery – Elective Caesarian	✗						
	Delivery – Instrumental	✗						
	Apgar Score 1 Minute	✓						
	Apgar Score 5 Minutes	✗						
	Gestational Age	✗						
	Prematurity	✗						
	Baby's Birth Weight	✗						

Area Assessed	Measure	Age in Months at Assessment					
		0	6	12	18	24	36	48
General Health and Health Problems								
	Baby's Crying is a Problem		⊗					
	Health (in Last 6/12 Months)		⊗	⊗	⊗	✓	⊗	⊗
	No. Health Problems Resulting in Medical Visits (in Last 6/12 Months)		⊗	⊗	⊗	✓	⊗	⊗
	Breathing Difficulties (in Last 6/12 Months)		⊗					
	Had Chest Infection (in Last 6/12 Months)			✓	⊗	✓	⊗	⊗
	Has Asthma			⊗	⊗	✓	⊗	⊗
	Age Diagnosed with Asthma							~s
	Activities Limited by Asthma							⊗
	Had Skin Problems						⊗	⊗
	Had Ear Infection						⊗	⊗
	Diagnosed with Chronic Illness						⊗	⊗
	Diagnosed with Physical Disability						⊗	⊗
Hospital Attendance, Accidents and Injuries								
	Hospital Inpatient Visits (in Last 6/12 Months)		⊗	⊗	✓	⊗	⊗	⊗
	Accidents & Injuries Requiring Medical Attention (in Last 6/12 Months)			⊗	⊗	⊗	✓	⊗
Immunisations								
	Has Received Necessary Immunisations at 4 months		✓					
	Has Received Necessary Immunisations at 6 months		⊗	⊗				
	Has Received Necessary Immunisations at 12 months			✓				
	Has Received Necessary Immunisations at 13 months				⊗			
Weight, Height, BMI								
	Child's Current Weight (Mother Report)		⊗	⊗	⊗	⊗		
	Child's Current Weight (Researcher Assessed)						⊗	⊗
	Child's Current Height (Researcher Assessed)						⊗	⊗
	BMI (Researcher Assessed)						⊗	⊗
	% Overweight (Researcher Assessed)						⊗	✓
Toilet Training								
	Is Toilet Trained							✓
	Age Toilet Trained							⊗
	Toilet Trained Sooner than Other Children							⊗

Area Assessed	Measure	Age in Months at Assessment						
		0	6	12	18	24	36	48
Nutrition								
	Baby Eats Appropriate Food		✓					
	Appropriate Frequency of Eating		✗					
	Appropriateness of Drinks			✗				
	Meeting Dietary Requirements Grains			✗	✓	✗	✗	✗
	Meeting Dietary Requirements Dairy			✗	✓	✗	✗	✗
	Meeting Dietary Requirements Protein			✗	✗	✓	✓	✓
	Meeting Dietary Requirements Vegetables			✗	✗	✓	✗	✓
	Meeting Dietary Requirements Fruit			✗	✗	✗	✗	✗
	Meeting Dietary Requirements: Fatty/Sugary Foods			✗	✗	✗	✗	✗
	Drinks Breastmilk/Formula Every Day				✗	✗		
	Poor Eating Habits					✓		
	Meeting Dietary Guidelines			✗	✗	✗	✓	✗
	Diet Quality Score			✗	✗	✓	✗	✗
Motor Skills								
	ASQ Gross Motor Skills Total Score		✗	✗	✗	✗	✗	✗
	ASQ Gross Motor Cut-Off		✗	✗	✓	✗	✗	✗
	ASQ Fine Motor Total Score		✗	✗	✗	✗	✓	✓
	ASQ Fine Motor Cut-Off		✗	✗	✗	✗	✗	✓
Sleep								
	Sleeps Undisturbed by 3 Months		✗					
	Time Taken to Get to Sleep		✗					
	Sleeps > 8 Hours Per Night		✗					
	Sleeps Undisturbed Through Night		✗	✗				
	Awakening a Problem		✗	✗				
	Difficulty Falling Asleep		✗	✗				
	CBCL Sleep Problems					✓	✗	✗
	CSHQ Measure of Sleep Disturbance							✗
	Hours of Sleep Each Day							✓
	Naps During Day							✗
	Regular Weekend Wake Up Time							✗
	Regular Weekend Bed Time							✗
	Regular Weekday Wake Up Time							✗
	Regular Weekday Bed Time							✗
	Length of Usual Nap							✗

What *PFL* Changed

 At birth	**High treatment mothers were less likely to have:** • been induced for delivery • had a delivery by Caesarean section, particularly by emergency Caesarean **High treatment children were less likely to have:** • poor Apgar Scores at 1 minute after birth
 At 6 months	**High treatment children were more likely:** • to have received their four month immunisations • to eat appropriate food.
 At 12 months	**High treatment children were:** • less likely to have had a chest infection in the previous 6 months • more likely to have received their 12 month immunisations
 At 18 months	**High treatment children were:** • less likely to have stayed in hospital in previous 6 months • more likely to meet daily requirements for dairy • less likely to be delayed in their gross motor skills
 At 24 months	**High treatment children:** • had better general health • had fewer health problems requiring medical visits • were less likely to have had chest infections or been diagnosed with asthma • had a better quality diet, were more likely to meet dietary requirements for protein and vegetables, and were less likely to have poor eating habits • had fewer sleep problems
 At 36 months	**High treatment children:** • had fewer accidents and injuries requiring medical attention • were more likely to meet dietary guidelines for protein and their overall diet • had better fine motor skills
 At 48 months	**High treatment children:** • were more likely to meet dietary requirements for protein and vegetables • had better fine motor skills and were less likely to be delayed in their fine motor skills • slept longer • were less likely to be overweight • were more likely to be toilet trained

Figure 6.2 - *Key Impacts on Physical Wellbeing and Motor Development during the Programme*

6.4 Did *PFL* improve children's hospital usage during the programme?

6.4.1 How we measured it

Records from Temple Street Children's University Hospital were used to compare the hospital usage of high and low treatment children from birth until they were 4 years old. Figure 6.3 shows the type of information gathered from the hospital records.

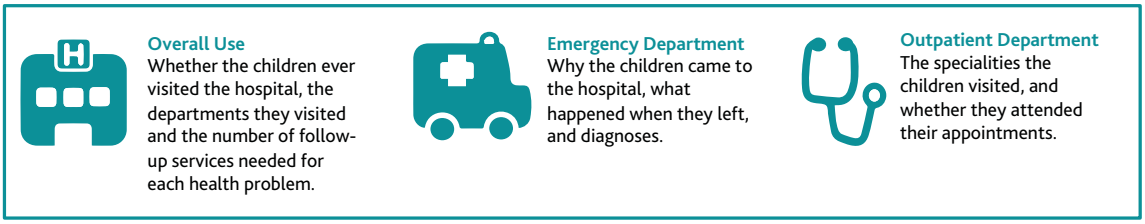


Figure 6.3 - *Measures of Hospital Usage during the Programme*

6.4.2 What we found

Overall, the *PFL* programme had a significant impact on hospital service usage, but a limited impact on types of hospital diagnoses. The results in Table 6.2 show that almost all of the high and low treatment children visited Temple Street Hospital at least once before the age of 4. There were no significant differences in the number of high and low treatment children who had visited the hospital, and there were no differences in the number of initial visits they had for each health concern. However, high treatment children used significantly fewer hospital services overall. This result was found as they used significantly fewer follow-up services, for example, they needed fewer x-rays or did not need to be admitted to the hospital.

High treatment children had significantly fewer visits to the Emergency Department. They also had significantly fewer visits to the Emergency Department Clinic, which is used for services like getting bandages changed and stitches taken out. There were no significant differences between the groups in how many times they had visited the Outpatient Department, Inpatient Department, or Radiography Department.

At the Emergency Department, high treatment children were significantly less likely to have attended for an urgent reason. There were no significant differences between the groups in the proportions ever attending the Emergency Department following an accident, or following referral by a GP or another hospital. There were also no significant differences between the groups in the number who had left the hospital on at least one occasion without waiting to be seen. Upon discharge, high treatment children were significantly less likely to require a prescription.

There were no significant differences between the groups on 4 out of the 5 most common diagnoses in the Emergency Department: i) lacerations, abrasions, contusions and wounds, ii) upper respiratory tract infection, iii) gastroenteritis, and iv) viral infections. However, high treatment children were significantly less likely to have been diagnosed with a fracture. High treatment children were also significantly less likely to have been diagnosed as having no medical problem or injury.

While there was no difference in the total number of times children attended Outpatient Departments, there were significant differences in how Outpatient services were used. High treatment children were significantly less likely to ever have used the five most commonly visited departments of Orthopaedics, Physiotherapy, Paediatrics, Occular Departments, and Plastic Surgery. There were no differences between the groups in the proportion who had cancelled or rescheduled Outpatient Department appointments. However, high treatment children were significantly less likely to have missed an appointment at an Outpatient Department.

Table 6.2. *Impact of PFL on Hospital Usage during the Programme*

Variable	N	n_{HIGH}/ n_{LOW}	M_{HIGH}	(SD)	M_{LOW}	(SD)	Statistical Difference *p*	Effect[1] Size
Hospital Attendance								
% Who Attended Before the Age of Four	108	(55/53)	0.89	(0.32)	0.86	(0.35)	ns	0.09[a]
Overall Hospital Use								
Number of Initial Visits to the Hospital	96	(48/48)	4.18	(2.90)	5.21	(4.25)	ns	0.28[a]
Number of Follow-Up Services used Following Initial Visit	96	(48/48)	2.21	(2.76)	4.75	(7.29)	*p*<.05	0.46[a]
Number of Hospital Services used Per Child	96	(48/48)	6.40	(5.17)	10.18	(10.78)	*p*<.05	0.45[a]
Hospital Department								
Number of Emergency Department Visits	96	(48/48)	3.45	(3.19)	4.59	(4.46)	*p*<.10	0.30[a]
Number of Emergency Department Clinic Visits	96	(48/48)	0.17	(0.42)	0.46	(1.08)	*p*<.05	0.35[a]
Number of Outpatient Department Visits	96	(48/48)	1.33	(2.64)	2.66	(4.76)	ns	0.35[a]
Number of Inpatient Department Visits	96	(48/48)	0.33	(0.68)	0.49	(0.80)	ns	0.23[a]
Number of Radiography Department Visits	96	(48/48)	1.12	(1.60)	1.88	(3.29)	ns	0.29[a]
Emergency Department Use								
% Ever with Triage Level 1, 2 or 3 (More Urgent)	91	(46/45)	0.39	(0.49)	0.69	(0.47)	*p*<.05	3.44[b,c]
% Who Ever Visited Due to Accidents	91	(46/45)	0.59	(0.50)	0.72	(0.45)	ns	1.85[b,c]
% Who Ever Presented on GP Referral	91	(46/45)	0.42	(0.50)	0.54	(0.50)	ns	1.59[b,c]
% Who Ever Left Before Being Seen	91	(46/45)	0.06	(0.25)	0.14	(0.35)	ns	2.32[b,c]
% Who Ever Received a Prescription Upon Discharge	91	(46/45)	0.45	(0.50)	0.69	(0.47)	*p*<.05	2.64[b,c]
Common Diagnoses								
% Lacerations, Abrasions, Contusions and Wounds	91	(46/45)	0.20	(0.40)	0.30	(0.46)	ns	1.77[b,c]
% Fractures	91	(46/45)	0.05	(0.23)	0.18	(0.39)	*p*<.05	3.68[b,c]
% Upper Respiratory Tract Infection	91	(46/45)	0.27	(0.45)	0.31	(0.47)	ns	1.18[b,c]
% Gastroenteritis	91	(46/45)	0.36	(0.49)	0.34	(0.48)	ns	0.92[b,c]
% Viral Infections	91	(46/45)	0.15	(0.36)	0.21	(0.41)	ns	1.50[b,c]
% Normal Child (No Illness or Injury Found)	91	(46/45)	0.09	(0.28)	0.24	(0.43)	*p*<.10	3.36[b,c]

Variable	N	n_{HIGH}/ n_{LOW}	M_{HIGH}	(SD)	M_{LOW}	(SD)	Statistical Difference *P*	Effect[1] Size
Outpatient (OP) Use								
% of OP Patients who Visited Orthopaedics	43	(17/26)	0.18	(0.40)	0.38	(0.49)	$p<.10$	2.75[b,c]
% of OP Patients who Visited Physiotherapy	43	(17/26)	0.00	(0.00)	0.12	(0.33)	$p<.10$	
% of OP Patients who Visited Paediatrics	43	(17/26)	0.15	(0.37)	0.75	(1.20)	$p<.05$	16.87[b,c]
% of OP Patients whoVisited Occular Departments	43	(17/26)	0.00	(0.00)	0.20	(0.41)	$p<.05$	
% of OP Patients who Visited Plastic Surgery	43	(17/26)	0.05	(0.21)	0.31	(0.47)	$p<.01$	9.36[b,c]
% Who Ever Cancelled or Rescheduled an OP Appointment	43	(17/26)	0.13	(0.34)	0.30	(0.47)	ns	2.94[b,c]
% Who Ever did not Attend an OP Appointment	43	(17/26)	0.16	(0.38)	0.39	(0.50)	$p<.10$	3.36[b,c]

Notes: ** indicates higher scores are a negative outcome. [1] Effect sizes (a) are Cohen's d and (b) are odds ratios. For odds ratios, the reference group in (c) were the low treatment group and in (d) were the high treatment group*

6.5 Did *PFL* improve physical wellbeing and motor development at school entry?

6.5.1 How we measured it

When the *PFL* children were in Junior Infants, their teachers answered questions about whether they were physically ready for school using the S-EDI (Janus et al., 2005). These measures are described in Figure 6.4.

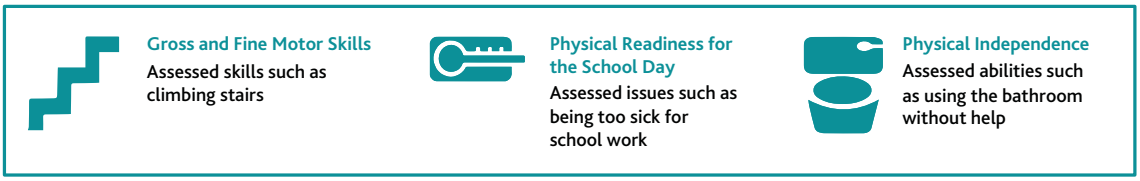


Figure 6.4 -*Measures of Physical Wellbeing and Motor Development at School Entry*

6.5.2 What we found

Table 6.3 shows the average scores for the high and low treatment children. Higher scores indicate that the children had better ability in this area. Children in the high treatment group had significantly better gross and fine motor skills and were more physically independent. There were no differences between the groups in their physical readiness for the school day.

Table 6.3 also shows the proportion of children who were rated as being 'not on track' physically for school compared to their peers. Children in the high treatment group were less likely to be rated 'not on track' in their physical independence. There were no significant differences between the number of high and low treatment children who were not on track in their gross and fine motor skills or physical readiness for the school day.

Table 6.3 - *Impact of PFL on Physical Wellbeing and Motor Development at School Entry'*

Variable	N	n_{HIGH}/ n_{LOW}	M_{HIGH}	(SD)	M_{LOW}	(SD)	Statistical Difference *p*	Effect[1] Size
Teacher Reported Physical Wellbeing and Motor Development Total Scores								
S-EDI Gross and Fine Motor Skills	149	(75/74)	7.55	(2.63)	6.62	(2.94)	$p<.05$	0.34[a]
S-EDI Physical Independence	149	(75/74)	9.05	(2.03)	8.55	(2.42)	$p<.05$	0.22[a]
S-EDI Physical Readiness for the School Day	149	(75/74)	8.84	(2.06)	8.80	(2.32)	ns	0.02[a]
Teacher Reported Physical Wellbeing and Motor Development 'Not on Track'								
*S-EDI Gross and Fine Motor Skills	149	(75/74)	0.31	(0.47)	0.41	(0.50)	ns	1.54[b,d]
*S-EDI Physical Independence	149	(75/74)	0.22	(0.42)	0.33	(0.48)	$p<.10$	1.75[b,d]
*S-EDI Physical Readiness for the School Day	149	(75/74)	0.28	(0.45)	0.25	(0.43)	ns	0.83[b,d]

Notes: ** indicates higher scores are a negative outcome. [1] Effect sizes (a) are Cohen's d and (b) are odds ratios. For odds ratios, the reference group in (c) were the low treatment group and in (d) were the high treatment group.*

6.6 Summary

Physical health and wellbeing is an important aspect of children's early school experience. Interviews with *PFL* children in their first year of school emphasised the importance of both gross and fine motor skills for engaging in school activities. These qualitative findings highlighted areas of importance for children in school and provided rich contextual information which aids the interpretation of the quantitative results. The impact evaluation found that the *PFL* programme had an impact on children's physical wellbeing and motor development before school entry regarding their nutrition and motor skills. The positive impact on children's motor skills was again evident at school entry. Teachers also reported a programme impact on physical independence. Hospital records showed that the *PFL* children used fewer hospital services and used services more effectively. These results are generally more positive than meta-analytic reviews where it was found that home visiting programmes had a mixed to little impact on physical wellbeing and motor development. Overall, these results indicate that the *PFL* programme had a favourable impact on children's physical wellbeing and motor development.

What did the *PFL* children tell us about their Physical Wellbeing and Motor Development in school?

Chasing
P.E
Ring a Rosie
Hide & Seek
Football

Motor skills are key to many of the activities children enjoy in school

The yard...
Is an important place where children can play and engage in gross motor activity

Children are proud
of their gross and fine motor skills and like doing things on their own ...but it can be challenging

"We are playing chasing...And that's another girl...All of them are happy"

Physical independence in daily routines and toile:ng are important

"We do football and we try to score goals..."

What children said...

"Yeah I don't like writing because my hand gets tired."

"...Because I always fall in yard.... I don't like it when I fall and cry"

"happy because their first time going to the toilet by themselves"

food

Food
School meals, especially lunch, are important

What children said...

"He'll have his lunch"

"Healthy yes. I eat healthy stuff I eat my nanny's apples, I eat nanny's bananas... And I eat carrots and grapes. I don't even eat peppers, they are too hot"

"Em, eat...eat lunch That is the chair and that is the table...an orange...A sandwich...It is a cheese. I sit in my seat...My friends Jane and Sarah sit there. You have to put your name on your table...My name is on my table, you put your name and you know what seat you are...that's bainne...a book... This is the sun...outside"

Figure 6.5 -*Teacher Reported Physical Wellbeing and Motor Development Total Scores*

Chapter Seven

Are the *PFL* Results Valid?

Before we conclude, it is important to consider the validity of the *PFL* results. Internal validity is the extent to which the differences found between the high treatment group and the low treatment group are likely to reflect the 'true' effect of the programme. The table below refers to issues which may affect the internal validity of the *PFL* study. Many of these issues concern the methodological quality of the evaluation.

Table 7.1. *Checking the Internal Validity of the PFL Results.*

The issue	Perhaps…	How did we test it?
Counterfactual	…the children in the high treatment group would have improved anyway?	We compared the children who were randomly assigned to the high and low treatment groups both at baseline and at multiple assessments during the evaluation. We tested how much more the children in the high treatment group improved compared to the low treatment group.
Randomisation	…the high and low treatment groups were re-assigned after randomisation?	After recruitment, we asked each parent to click a button on the randomisation website where they were automatically assigned an ID number and their treatment assignment. This generated an automatic email with their assignment condition and ID number which was sent to the manager of the evaluation and the programme. This allows us to check whether the parents were reassigned once randomised.
Differential Attrition	…the type of families who dropped out of the study differed across the high and low treatment groups?	We compared the baseline characteristics of the families who stayed in the study and the families who left the study at each time point. If the type of families who dropped out of the high and low treatment groups were different, the results could be biased.
Contamination	…the low treatment group got the high treatment supports from the high treatment group?	We asked parents in the high and low treatment groups whether they shared their *PFL* materials with anyone. We also asked both groups if they knew what particular parenting phrases meant. These phrases were discussed by mentors during the home visits. If the number of participants who knew what these phrases meant were similar in both groups, it would suggest that contamination occurred.
Non-Compliance (I)	…the high treatment group got additional treatment elsewhere?	We compared the baseline characteristics of the families who stayed in the study and the families who left the study at each time point. If the type of families who dropped out of the high and low treatment groups were different, the results could be biased.
Non-Compliance (II)	…some families in the high treatment group got more treatment than other high treatment families?	We accessed the implementation records of the *PFL* staff which recorded all contact with the high treatment families. We then examined how much treatment each family received. We also looked at the baseline characteristics associated with the amount of treatment.
Compensatory Rivalry	...the low treatment group got the high treatment supports elsewhere?	We asked parents in the low treatment group at 36 months if they had taken part in any parenting classes or received parenting leaflets, books, or guides from anyone apart from *PFL*.
Compensatory Equalization	…the programme staff gave the high treatment supports to the low treatment group?	We accessed the implementation records of the *PFL* staff which recorded all contact with the *PFL* families.

What did we find?	Risk of bias?
There were few differences between the high and low treatment groups at baseline. Yet there were many differences in child outcomes at the follow-up assessments. This suggests that the programme caused improvements in the high treatment group over and above any natural improvements in ability or because the high treatment group had better characteristics than the low treatment group.	Low
There were a small number of occasions when two emails from the randomisation website were sent at the same time or in close succession to one another. In each case, follow-up phone calls to the recruiter found that these incidences occurred due to computer/administrative error i.e. the assignment screen did not immediately appear and the participant clicked the button again. In these cases, the participants' first assignment condition held and the other number was unassigned.	Low
There were few differences between the types of families who stayed in the study across the high and low treatment groups. There was some evidence that those who stayed in the programme had better socio-demographiccharacteristics. To account for any bias that differential attrition may introduce, a inverse probability weighting (IPW) method was used to adjust the results. The IPW results and non-IPW results were very similar, suggesting that the results were not biased by differential attrition.	Low
Although many parents reporting sharing their *PFL* materials with others, we found that parents in both the high and low treatment groups shared their *PFL* materials with others. We also found that significantly fewer low treatment mothers knew what the parenting phrases meant compared to the high treatment mothers, suggesting major contamination had not occurred.	Medium
We found that none of the high treatment parents said they had taken part in another parenting course and 26% said they had received some parenting information, mainly leaflets distributed at health centres or the local schools. Thus, there is little evidence that the high treatment group actively sought out other parenting supports.	Low
On average, the high treatment families received less treatment than prescribed, although there was large variation in how many home visits, baby massage, and Triple P classes that the families received. Overall few baseline characteristics predicted the amount of treatment that families received. There was some evidence that those who had more treatment had better socio-demographic characteristics. As is common practice in the RCT field, we used an intention-to-treat approach which meant we did not take into account how much treatment the families actually received. This means that our results may be an under-estimation of the impact of the programme.	Medium
We found that only 5% of low treatment parents said they had taken part in another parenting course and 20% said they had received some parenting information, mainly leaflets, distributed at health centres or the local schools. Thus, there is little evidence that the low treatment group actively sought out the high treatment supports.	Low
There was no documented evidence that the low treatment group had received any home visits, baby massage, or the Triple P programme from the *PFL* staff. Thus, the results are unlikely to be biased by compensatory equalization.	L ow

The issue	Perhaps…	How did we test it?
Hawthorne Effect	…the high treatment group changed their behaviour because they were being regularly assessed?	There was no explicit test for this.
John Henry Effect	…the low treatment group changed their behavioaause they were being regularly assessed?	There was no explicit test for this.
Misreporting	…the high and low treatment group misreported their survey responses in different ways?	We tested for differential misreporting across the high and low treatment groups at 24 months using the Social Desirability Scale-17 (Stober, 2001). We also tested the robustness of the parent reported results by controlling for the level of socially desirable responding in the analyses. If the results concerning the impact of the programme remained the same when we controlled for social desirability it suggests the misreporting did not bias the results.
Contamination	…the low treatment group got the high treatment supports from the high treatment group?	We asked parents in the high and low treatment groups whether they shared their *PFL* materials with anyone. We also asked both groups if they knew what particular parenting phrases meant. These phrases were discussed by mentors during the home visits. If the number of participants who knew what these phrases meant were similar in both groups, it would suggest that contamination occurred.
Experimenter Effects/ Blinding	…the high treatment group got additional treatment elsewhere?	We ensured that the researchers who conducted the interviews and assessments were blinded i.e. they did not know which families were in the high treatment group and the low treatment group.
Assessment Administration	…the direct assessments were not appropriately carried out?	We ensured that the researchers who conducted the assessments were trained in the use of the instruments. Researchers had to reach a designated level of inter-rater reliability on two pilot assessments during training to be permitted to conduct direct assessments to ensure that all children were assessed in the same way. We also cross-checked the most subjective direct assessment scale.
Assessment Context	… the location of the direct assessments mattered?	We conducted a statistical analysis which controlled for the location of the direct assessments (e.g. home, village centre, or childcare centre). If the results concerning the impact of the programme remained the same after controlling for location it suggests the location of the assessment did not matter.

What did we find?	Risk of bias?
As the high and low treatment groups were assessed at the same number of time points, using the same instruments, and under the same conditions, we must assume that any changes in behaviour due to assessment were equal in both groups.	Medium
As the high and low treatment groups were assessed at the same number of time points, using the same instruments, and under the same conditions, we can assume that any changes in behaviour due to assessment were equal in both groups.	Medium
We found no significant difference between the groups in terms of their level of socially desirable responding. This suggests that although participants may have attempted to answer questions in a more favourable manner, there were no differences in the levels to which they did so in either group. The results, controlling and not controlling for social desirable responding, were largely identical. Thus, the results were unlikely to be biased by differential misreporting.	Low
Although many parents reporting sharing their *PFL* materials with others, we found that parents in both the high and low treatment groups shared their *PFL* materials with others. We also found that significantly fewer low treatment mothers knew what the parenting phrases meant compared to the high treatment mothers, suggesting major contamination had not occurred.	Medium
The researchers conducting the assessments could not physically or electronically access the data file which included the treatment assignment of the groups. Only the Principal Investigator and team leader had access to this information. In some cases, the families inadvertently made reference to their treatment assignment during the assessment, for example, by referring to their mentor. We minimised the impact of this by ensuring that in most cases, the same family was not interviewed by the same researcher at multiple time points. Also, the researchers who conducted the assessments with the families did not conduct the statistical analyses of the results. This ensured that the results could not be biased by experimenter effects.	Low
Researchers were intensively trained on the administration of the assessment and all reached the appropriate level of inter-rater reliability before conducting assessment with the *PFL* sample. The Copying Core Scale (the most subjective scale) was scored twice by two researchers and any disagreements were resolved. Thus, the results are unlikely to be driven by assessment administration.	Medium
We found that the main outcome results remained the same regardless of whether we controlled for location of assessment or not. Thus, the results were unlikely to be biased by the location of the assessment.	L ow

The issue	Perhaps…	How did we test it?
Data Entry	…the data were incorrectly recorded?	We used computer aided personal interviewing on tablet laptops in order to minimise the amount of physical data entry. Where paper assessments were used the data were entered by two researchers independently using a double-entry system which cross checked for inconsistencies.
Instrument Scoring	…the results were sensitive to the statistical methods used?	We cross-checked random samples of all STATA code used to score the instruments based on the administration and scoring manuals. Different researchers than those who wrote the original code performed the cross-checks.
Statistical Robustness	…the results were sensitive to the statistical methods used?	We tested the sensitivity of the results to the methods used by applying and comparing two different statistical methods. All results were calculated using traditional t tests, as well as the more sophisticated permutation tests. We also conducted three different analyses and compared the results. First, we tested for mean differences. Second, we tested for mean differences while controlling for attrition using IPW. Third, we tested for mean differences while applying the IPW weights and controlling for child gender. All results were compared.

What did we find?	Risk of bias?
Automatic routing on the electronic surveys ensured that there were no interviewer-driven errors in asking the correct questions. The double-entry system for paper files identified any errors and discrepancies were corrected. Thus, the results were unlikely to be driven by incorrect data entry.	Low
Overall, few errors in coding were found and any errors identified were corrected. Thus, the results were unlikely to be driven by incorrect data scoring.	Low
There were few differences between the results estimated using t tests or permutation tests. The results which applied the IPW weights and controlled for gender were our most conservative estimates pf programme impact, therefore they were chosen to be the main results reported throughout the report.	L ow

Chapter Eight

Conclusion

This report has drawn together a wealth of information from parents, teachers, children, and administrative records to consider the overall impact of the *PFL* programme on children from birth until school entry. Based on the weight of evidence it is clear that the *PFL* programme improved the lives of the participating children, and ultimately achieved its aim of getting children ready for school. By implementing thorough checks and procedures throughout the evaluation, and subjecting the data to rigorous testing, we are confident that these findings are robust. The magnitude of the effects on children's cognitive, social and emotional, and physical development were generally larger than those found in evaluations of other home visiting programmes, while the medium effect sizes for language development and children's approaches to learning were largely in keeping with those found in other programmes. However, it is difficult to truly compare the results from different home visiting studies due to wide variations in programme goals, target groups, and implementation practices (Gomby, Culross, & Behrman, 1999). In this concluding chapter, we consider how and why the *PFL* programme improved children's lives and outline the implications of these findings for policy, practice, and research.

8.1 Why did *PFL* improve children's school readiness?

> "...I learn something new every day, ya learn something new every day (in PFL)"
>
> High Treatment Mother

The *PFL* programme was based on the idea that providing support to parents would improve their wellbeing, as well as change their attitudes and behaviours concerning children and parenting. It was predicted that these positive changes in parents would impact on children's development as a result of the improved stimulation, resources, and interactions that parents would provide for their children. Throughout the evaluation, we found very few changes in parent's wellbeing or attitudes. However, parents made a number of important behavioural changes, and as a result, the *PFL* children started school with more advanced skills.

The limited impact on parent's wellbeing may be a consequence of the high level of diagnosed mental health conditions among the participating mothers before starting the programme. The role of the *PFL* mentors was supportive, not therapeutic, and only a minority of the Tip Sheets delivered during the home visits focused on the mother's wellbeing. In addition, home visiting programmes tend to be better at promoting new learning, rather than addressing longstanding mental health issues (Ammerman, Putnam, Bosse, Teeters, & Van Ginkel, 2010; Fergusson, Horwood, & Grant, 1998; Sweet & Appelbaum, 2004).

The limited impact on parent's attitudes may be explained by the difficulty in trying to change strongly held beliefs and attitudes (Brooks-Gunn & Markman, 2005). Also, standardised measures and statistical tests can miss the small, but important, changes that parents have made as a result of the intervention. Qualitative interviews with the *PFL* mentors referred to the difficulties of encouraging parents to make changes, and yet recognising the importance of these small changes:

> "...it's very hard to get people to make changes. So that's why even the tiny little things are a huge source of satisfaction...it's great when there's a small shift, even when someone starts to think about something a little bit differently and starts asking questions and talking to you in a slightly different way you think "ah great" you know."
>
> *PFL* Mentor

While parents' wellbeing and attitudes did not appear to change during the programme, *PFL* did have a positive impact on their parenting behaviours. These impacts are summarised below and are based on findings reported in previous evaluation reports found at ***http://geary.ucd.ie/preparingforlife.***

What kind of changes did parents make...

IN INFANCY?

In the first two years of the programme, parents made their houses safer and were less likely to smoke around their children. Parents spent more time interacting with their children, and gave them a variety of activities to do. They made sure not to restrict their children too much, and gave them the opportunity to explore their worlds. Parents were also more understanding of their children's behaviours and were less likely to punish them unnecessarily.

IN TODDLERHOOD?

In the final two years of the programme, parents continued to be more accepting of their children's difficult behaviours. Their houses and routines were more organised, and children spent less time watching TV. Parents were more involved in their children's learning and were better able to handle the typical ups and downs of parenting. They were less likely to give in to demands from their children and more likely to see any necessary punishments through.

These changes in parenting behaviour were a consequence of the extensive and diverse supports offered to families in the high treatment group including intensive mentoring, parent training, and baby massage classes. The *PFL* mentors worked with families for a substantial and important period of their children's lives, and therefore it is likely that these positive changes in behaviour were a result of the strength and quality of the mentor-mother relationship. This is consistent with the home visiting literature which finds that a good relationship between parents and programme staff is key to the success of home visiting programmes (Wesley, Buysse, & Tyndall, 1997).

Qualitative research from the *PFL* parents and mentors consistently pointed to how strong and important their relationships were with each other. The following excerpt, taken from a focus group of high treatment mothers, describes this relationship:

High Treatment Mother 4: As well though, it's like a friendship as well isn't it..

High Treatment Mother 1: Yeah

High Treatment Mother 4: Cos you see them a lot, and you're building up relationships with people

The strength of these relationships, coupled with the high quality information from the Tip Sheets and Triple P, facilitated these behavioural changes. Parents particularly valued the Tip Sheets and saw them as a core component of the *PFL* programme. They recognised that the drip-feed method of Tip Sheet delivery worked well for them:

> "Well it's like you're not even getting them all at once. If they handed them to you all at once you'd sit there and look at them. They wouldn't even read them. Like they're only bringing them out two or three every time you see them like so they're not... so you do actually sit and read them. Well I do anyway."
>
> High Treatment Mother

It is also possible that the common supports offered to both high and low treatment families may have had a positive impact by complementing the high treatment supports. For example, during the home visits the mentors encouraged parents to play with their children in ways which enriched their learning, but it is possible that the availability of the developmental toys facilitated this play-based learning, and were an important part of this process.

These changes made by parents regarding their home environment, how they acted towards their children, and the types of activities they engaged in together were likely to have had important consequences for their children's development. How these changes may have impacted on each area of school readiness is explored below.

In considering why the *PFL* programme improved children's outcomes, it is important to consider the dynamic and complex nature of child development. For example, the development of language skills relies on children having appropriately developed cognitive skills and oral motor skills (Bartolotta & Shulman, 2010; National Infant & Toddler Child Care Initiative; NITCCI). As *PFL* had a positive impact on multiple areas of children's development, any positive impacts in one area of development may have stimulated development in another.

8.2 Changes in parenting and children's cognitive development

The *PFL* programme improved children's cognitive development from 18 months onwards and the effects were consistent across reports from mothers, teachers, and direct assessments with children. The early emergence of these findings may help to explain the significant gaps in the cognitive abilities of the children in the high and low treatment groups by the time they started school. This positive impact on cognitive development may be a result of how the *PFL* parents interacted with their children and the changes they made to the home environment.

Early childhood is when most of the brain's critical development occurs, thus experiences during this time strongly influence their future functioning (Irwin, Siddiqi, & Hertzman, 2007). The *PFL* parents spent more time interacting with their children, gave them freedom to explore, were involved in their learning, and engaged them in a variety of activities in their early childhood. These practices, interactions, and activities are recognised as key means of stimulating children's cognitive development (Edwards, Sheridan, & Knoche, 2010; Farah et al., 2008).

The parents also provided safer homes for their children, which may have contributed to their cognitive development as children learn best when they feel safe (Rushton & Larkin, 2001). The *PFL* parents also had more organised homes and were more likely to have set routines in the home. This type of environment has been shown to stimulate children's learning as routines "provide the two key ingredients necessary for learning: relationships and repetition" (Zero to Three, 2010, p.1). Another factor which may have contributed to children's cognitive development were the improved parenting practices regarding TV viewing. Time spent watching TV reduces the time children spend in developmentally enriching activities and interactions with their parents (Tomopoulos et al, 2010; Zimmerman & Christakis, 2005).

These changes in parenting behaviour and gains in children's cognitive development were a consequence of the mentoring support and Tip Sheets delivered during the home visits and group sessions. A common theme of the Tip Sheets was to use play and everyday tasks as learning opportunities. Children's cognitive development can progress at a faster pace when adults challenge and encourage them through play (Damast, Tamis-LeMonda, & Bornstein, 1996). Over the course of the programme, 12% of the Tip Sheets delivered to families focused on the development of children's cognitive skills. These Tip Sheets promoted activities such as using stacking, sorting, matching, and counting objects in play and daily activities. In addition, a further 16% of Tip Sheets were dedicated to learning through play. It is possible that the modelling techniques used by the mentors and the play-based nature of the home visits, alongside the age-appropriate developmental packs, encouraged the parents to play more frequently with their children, and in cognitively stimulating ways. Furthermore, as the *PFL* children experienced better health, they may have been more physically ready to learn. The children's healthier diets over the course of the programme, in particular their increased protein intake, may also have stimulated their cognitive development (Doyle, O'Sullivan, & Fitzpatrick, in press).

These improved cognitive skills provide an important foundation for the child's future development. They will help them to better adapt to the school environment (Rimm-Kaufman & Pianta, 2000) and will contribute to their reading, writing, maths, and future academic achievement (Davies, Janus, Daku, & Gaskin, 2016; Duncan et al., 2007).

"He's just so confident in himself and I say it's from like (the mentor) coming out and telling me like do this with him, do little things, like let him help you with the shopping, or let him help you clean up..and his confidence is brilliant now, he'd not be afraid to sit and trying something new, and or that way he's learning other things quicker as well, I thought that was good" High Treatment Mother

8.3 Changes in parenting and children's language development

The *PFL* programme improved children's verbal abilities, communication, and emerging literacy skills, although the effects were less consistent than those found for cognitive development. The findings were somewhat dependent on the instruments used. Using the most reliable instrument (the BAS II direct assessment), we found strong evidence that the *PFL* programme had improved children's verbal abilities by school entry.

This finding may be attributed to the greater amount of time the *PFL* mothers spent interacting with their children and being involved in their learning. Both the mentoring support and the Tip Sheets focused on methods for promoting children's language development. Fourteen percent of the Tip Sheets concentrated on ways to develop children's language and parents were encouraged to help children by reading with them and helping them to develop their speech and language skills by talking to them. The Tip Sheets also encouraged parents to answer and ask questions, explain things to their children, as well as describe their activities, share feelings, and sing nursery rhymes.

"We encourage her with reading, we never shorten words down and we always have full blown conversations with her" High Treatment Mother

Such interactions have been shown to have a positive impact on children's language development as they offer important opportunities for parents and children to communicate with one another (Edwards et al., 2010). The importance of communication between parents and children was a common theme across all the *PFL* Tip Sheets, as well as in the Triple P programme, and in the baby massage classes. For example, in the Triple P sessions, parents were encouraged to make children aware of the reasons for parents' rules and the consequences of breaking those rules through talking to them. In the baby massage classes, parents were encouraged to talk to and sing to their baby during the massage. Children's language may also have been encouraged by the books provided in the developmental book packs. The high treatment families may have benefited more from these than the low treatment families as their mentors showed them ways of reading to their children which would be most beneficial. Also, as the *PFL* children watched less TV, this may have resulted in richer parent-child interactions, as it has been found that parents typically spend less time speaking to their children and speak to them in shorter sentences when a TV is on (Kirkorian, Pempek, Murphy, Schmidt, & Anderson, 2009; Mendelsohn et al., 2008; Tanimura, Okuma, & Kyoshima, 2007). Finally, the consistent impact on children's cognitive skills may also have contributed to their improved language development by school entry.

These findings for language development are important, not only for the transition to school, but for future success in adulthood. The *PFL* children started school with the necessary skills to communicate with others and make sense of what they are hearing. Their improved language skills will help them to get along with friends and contribute to their academic outcomes as they progress through school (Monopoli & Kingston, 2012; NICHD, 2005)

8.4 Changes in parenting and children's approaches to learning

The *PFL* programme had some impact on how children approached learning. While teachers reported no differences in this area, parents reported a positive impact on their children's learning behaviours in the later years of the programme, and the direct assessments showed a positive impact on children's ability to manage their attention.

These results may be attributed to the greater involvement of the *PFL* mothers in children's learning, as well as the greater freedom they gave to their children to explore their worlds, while engaging them in a variety of activities. The findings are also supported by the Tip Sheets where 16% of them encouraged the development of positive approaches to learning. They focussed on using play to encourage young children to learn and explore their worlds and suggested activities where children could learn by using all of their senses. Parents were encouraged to discuss and describe what their child was doing during activities, and to support them in seeing tasks through to the end. It is possible that these Tip Sheets led parents to encourage their children to play and learn in ways which instilled more positive approaches to learning. In addition, as there is an established connection between cognitive development and executive functioning (Garon, Bryson, & Smith, 2008), the positive impact on children's ability to control their attention may also be explained by their improved cognitive development.

This domain of school readiness was the only area in which teachers did not report any positive programme effects. This may be due to the difficulty in measuring children's approaches to learning. It is still the least studied school readiness domain, and research on how to effectively measure this area of children's development is lacking (Barbu, Marx, Yaden Jr, & Levine-Donnerstein, 2015). As teachers were rating children's approaches to learning after teaching them for only a few months, it may have been difficult for them to rate children on, for example, their interest in maths. Regardless, the impact on children's ability to manage their attention as elicited through the direct assessment is significant, as children more skilled in this area have been shown to have better academic achievement in the future (McClelland, Morrison, & Holmes, 2000).

8.5 Changes in parenting and children's social and emotional development

The *PFL* programme improved children's social and emotional development from 24 months onwards by reducing internalising and externalising behavioural problems. From 36 months, the programme also enhanced children's positive behaviours including their prosocial behaviours, social competence, and autonomy.

As *PFL* parents spent more time with their children and were more accepting of their children's difficult behaviour, this may have contributed to their greater social and emotional functioning (Edwards et al., 2010). These effects may have been reinforced by the children's exposure to more organised home environments and established routines. Children feel safe and secure when they live in more organised households, and this has been identified as important in promoting social and emotional development (Spagnola & Fiese, 2007). The *PFL* parents were also more likely to follow through with discipline which may have helped their children to internalise rules on how behave appropriately (Mauro & Harris, 2000; Lerner, Wertlieb & Jacobs).

Techniques for reducing problematic behaviours and promoting positive behaviours were particularly emphasised by the mentors during the home visits. Almost one third of the Tip Sheets (32%) focussed on methods for promoting social and emotional development. The Tip Sheets encouraged sensitive and responsive parenting and provided advice on how to deal with challenging behaviours in children such as lying and whining. They also taught parents how to speak to their children about their feelings and interactions with others. As the children got older, the mentors delivered Tip Sheets dedicated to helping children to make choices for themselves, take turns, share with others, and to see other children's point of view. The improvements in children's social and emotional development may also be explained by parents' participation in the Triple P programme, which offered parents strategies for dealing with difficult child behaviour and for encouraging good behaviour.

"Since doing the Triple P things have calmed. I really enjoy him and I have more time to enjoy him cos they're all in school" High Treatment Mother

While not all parents took part in the Triple P group sessions, all families were exposed to Triple P during the home visits as the principles and techniques of Triple P influenced the way in which mentors encouraged parents to interact with their children.

These results for social and emotional development are important, as how the *PFL* children cope with the demands of the new and challenging school environment will depend on their skills in this area. Their improved social and emotional skills will help them to be more successful in school and to get on better with classmates and teachers (McAuliffe, Hubbard, & Romano, 2009; Raver & Knitzer, 2002; Zins, Elias, & Greenberg, 2007).

8.6 Changes in parenting and children's physical wellbeing and motor development

The *PFL* programme improved children's physical wellbeing and motor development from birth onwards. The programme impacted multiple aspects of the child's health including general health, immunisations, hospital use, nutrition, motor skills, sleep, BMI, toilet training, and physical independence. The programme also changed how the families used hospital services. The *PFL* children used fewer services, and made fewer visits to the Emergency Department and Emergency Department Clinic. These effects on hospital usage may be attributed to improved preventative behaviours on the part of the parents such as immunising their children on time, feeding them a healthier diet, and not exposing them to cigarette smoke.

These effects, while contrary to much of the home visiting literature, were unsurprising given the strong emphasis on health in the *PFL* programme. During the home visits, over half of all Tip Sheets delivered to parents dealt with promoting health. The mentors provided advice on recognising when children are unwell and how to treat minor illnesses, as well as providing guidance on when they should visit the GP or the hospital. These measures may have prevented the escalation of illnesses to a point where they needed hospital attention. This may also explain why the *PFL* children visited the Emergency Department for less urgent reasons. and why they were less likely to be diagnosed as having no illness or injury when they visited the Emergency Department. The improvements made regarding safety in the home may also explain why the children visited the Emergency Department for less urgent reasons, and why they were

less likely to experience a fracture. In addition, the more organised households may explain why parents were more likely for bring their children to scheduled Outpatient appointments.

As well as emphasising appropriate health service use, the Tip Sheets also sought to improve specific aspects of the child's health. For example, the mentors encouraged parents to develop their children's motor skills by, for example, encouraging them to use scissors and draw shapes to promote fine motor skills. The mentors also provided information on the benefits of immunisation and a number of Tip Sheets offering tips on helping children to sleep at night, while some of the Triple P training dealt with the importance of bedtime routines. The consistent positive impact of the programme on children's diet may be attributed to the focus on nutrition during the home visits and the Healthy Food Made Easy course. Although participation in this course was low, findings from qualitative research showed that families responded positively to it, and their discussions indicated that they had applied what they had learned during the course in order to make healthy food choices for their child:

> Like healthy instead of buying a box of quarter pounders you buy the mince, a good lean mince... ye buy the good mince and you make your burgers and that.
>
> High Treatment Mother 3

> Porridge and all into your burgers, and you wouldn't think of putting porridge...
>
> High Treatment Mother 1

The fact that *PFL* children were less likely to be overweight by age 4 may be a consequence of this improved diet as well as their reduced screentime. Childhood weight problems are consistently linked to the sedentary nature of watching TV and due to less time spent in more physical activities (Harrison, Burns, McGuinness, Heslin, & Murphy, 2006; He, Irwin, Sangster Bouck, Tucker, & Pollett, 2005). The support offered to parents through the Tip Sheets on toilet training may help to explain why the *PFL* children were more likely to be toilet trained by age 4. In addition, the Triple P programme was also available for individual families experiencing difficulties with toilet training. Finally, throughout the course of the programme, the mentors encouraged the parents to let their children take small steps towards independence, such as feeding themselves and helping to dress themselves, which may have led to the positive finding on children's physical independence in school.

These ranges of improvements in children's physical wellbeing and motor development are important as they will support the children to better adjust to school life (Bart et al., 2007), encourage their academic achievement (Grissmer et al 2010; Hoyland et al., 2009), and lead to better health in adulthood (Case, Fertig, & Paxson, 2005).

8.7 Concluding remarks

To conclude, the *PFL* programme improved the school readiness of children in a disadvantaged area of Dublin by supporting parents to change their behaviour in ways which promoted child development. We can be confident that these findings are valid as the programme was evaluated using an RCT design, and due to the rigour of the evaluation methodology, practice, and analysis. While other intervention programmes have found positive impacts during early childhood, in some cases the effects faded over time, yet re-emerged later in adulthood (Heckman, 2000). It remains to be seen whether the success of the *PFL* programme at school entry will persist into the children's later lives, but for now, thanks to the efforts of the *PFL* parents and the programme staff, we know that the *PFL* children have started school with the foundations set to reach their full potential.

8.8 What are the implications of these findings?

As *PFL* is one of the most extensive randomised control trials of an early childhood intervention conducted in Europe, the results of its evaluation has implications for policy, practice, and research.

8.8.1 Policy implications

The findings from the *PFL* evaluation of the programme's impact and implementation may contribute to policy development in the area of early childhood intervention programmes generally, and home visiting programmes specifically.

- *PFL* makes an important contribution to the ***international evidence-base*** on how best to support children's school readiness. It demonstrates that intensive family support from pregnancy onwards is key to improving the outcomes of disadvantaged children.

- *PFL* has demonstrated its capacity to contribute to the five areas of development which the Government have aimed to improve in the ***Better Outcomes, Brighter Futures*** national policy framework for children and young people (aged 0 – 24 years) (Government of Ireland, 2014). These areas aim for children i) to be active and healthy, to have physical and mental wellbeing, ii) to achieve their full potential in learning and development, iii) to be safe and protected from harm, iv) to be able to experience economic security and opportunity, and iv) to be connected, respected and contribute to their world. As *PFL* impacted on multiple dimensions of children's lives, in particular, physical health and wellbeing, and learning and development, the programme has the ability to address each of these five national outcome areas.

- In ***Better Outcomes, Brighter Futures*** the Government has also committed to ***prioritising supports for parents, prevention and early intervention,*** and ***investment in programmes*** that have strong evidence of effectiveness. As such, the *PFL* programme provides a strong point of reference for the Government in this area. Using multi-informant data we have shown that *PFL* is a useful, valued, and effective programme which works with parents to prevent the emergence of difficulties later in life. In particular, the effectiveness of mentoring as a method for encouraging behavioural change among parents is key.

- *PFL* was part of the Prevention and Early Intervention Programme funded by Government and Atlantic Philanthropies alongside a host of other intervention programmes operating from pregnancy until adolescence. The ***proven effectiveness of PFL*** offers a model of intervention that may be effective in other communities with similar characteristics.

- The importance placed on the *PFL* Tip Sheets by both mentors and families supports the utility ***of providing information to parents*** on ways to enrich child development as in the Health Service Executive's (HSE's) Caring for your Baby and Caring for your Child Booklets. Parents with low levels of literacy may benefit from having this information delivered to them verbally during child health visits with their GP, Area Medical Officer, or Public Health Nurse.

- An extensive range of data were collected over 8 years on families living in the *PFL* catchment area. This data will be archived in the Irish Social Science Data Archive as part of the Children's Research Network's Prevention and Early Intervention Initiative. This resource will serve as a useful tool for exploring the lives and ***needs of a disadvantaged community*** in Ireland.

8.8.2 Practice implications

The data gathered as part of the *PFL* impact and implementation evaluation may prove informative regarding implications for home visiting practice and future roll-out of the *PFL* programme:

- The majority of participant drop-out occurred during the first six months of programme implementation. Therefore, we would recommend that the programme pays particular attention to ***engaging and retaining participants*** during pregnancy and around the birth of the child.

- The families who did not join *PFL* had fewer risk factors than the families who did join. This suggests that the programme was successful in attracting the families most in need of intervention. If the programme is rolled out in other communities with different characteristics it may be important to re-visit the ***eligibility criteria*** for programme entry.

- Given the length of the programme, there was relatively little staff turnover among the mentors. As *PFL* families rated the mentor-participant relationship very highly, continuing to minimise ***mentor turnover*** should be encouraged.

- On average, the *PFL* families received monthly home visits. This level of intervention appears to be sufficient to generate important gains in outcomes for the average child. Yet there was considerable variability in the number of home visits delivered, and it is likely that the amount of support needed was a result of ***tailored delivery*** on the part of the mentors. While working within the boundaries of the *PFL* manual, the programme should continue to be ***flexible*** to the needs of families regarding the timing, location, and focus of the home visits.

- The Tip Sheets were highly valued by both *PFL* families and mentors and were a core component of the curriculum. Future roll-out of the *PFL* programme should ensure that the ***Tip Sheets*** are kept up to date with new information and remain colourful and easy to read.

- While all families were exposed to the Triple P programme as its principles and techniques influenced the delivery of the home visits, the take-up rate for ***Group Triple P*** was relatively low. It may be important to investigate the reluctance by some families to participate in these group sessions.

- The *PFL* implementation team's records provided important information on how much support the families received. Future evaluations would benefit from either observational data or the use of ***standardised content form*** to provide a richer account of the context and delivery of the home visits.

8.8.3 Research implications

Throughout the *PFL* evaluation a number of key research practices were put in place to maximise the quality of the study. These may prove useful for others conducting evaluations of similar programmes in the future:

- The ***measurement*** of multiple outcomes at multiple time points from multiple perspectives using quantitative and qualitative methods allowed us to form a comprehensive picture of the impact of *PFL* over time.

- One of the largest threats to internal validity in RCTs is compromised randomisation. The use of a dedicated ***online randomisation platform***, with automated emails on participant assignment, minimised the potential for participant reassignment after randomisation.

- The collection of detailed ***implementation data*** on dosage and attrition is important for interpreting the results, as well as correcting for any bias that variation in intervention delivery or premature dropout may introduce.

- The inclusion of ***blue-dye questions*** to measure contamination allowed us to address one of the key concerns of conducting community-based RCTs with individual-level randomisation.

- The use of ***shopping vouchers*** as compensation for participating in assessments and focus groups may contribute to relatively high retention rates.

- Research staff turnover at both junior and senior levels is inevitable in an 8 year longitudinal study. While a programme manual was used to guide the *PFL* implementation staff, an ***evaluation manual*** also proved an invaluable tool to guide new *PFL* research staff on the study's procedures, protocols, instruments, and analysis.

This report, along with the seven previous research reports on the *PFL* evaluation, has demonstrated substantial gains for the participating families by school entry. Yet there are a number of additional studies which could enhance this work:

- A ***cost-benefit analysis*** of the *PFL* programme is currently underway and will inform the financial implications of future programme implementation.

- An ***impact evaluation of Phase II*** of the *PFL* programme is currently underway. This evaluation is tracking the roll-out of the programme to all families in the *PFL* catchment area, as well as two other sites in Dublin and Wicklow. This study involves evaluating the impact of the programme on families who join the programme during Phase II using non-experimental methods. The outcomes of the Phase II families will be compared to the outcomes of the Phase I families when they are 2 and 4 years old. This will provide evidence on the success of programme replication within the *PFL* community.

- If the *PFL* programme is rolled-out in communities with different characteristics, it would be prudent to conduct a ***replication study*** to test whether the gains made in the *PFL* community can be replicated among different populations.

- *PFL* has improved the skills and development of a cohort of children residing in the *PFL* catchment area. It is possible that these benefits will create ***positive externalities*** over time by raising the skill level of other children in the community. Continuation of the Children's Profile at School Entry study, which has tracked the school readiness skills of all children in the *PFL* communities since 2008, may provide important information on the wider impact of the programme in the long term.

- A ***follow-up study*** of the original *PFL* participants would inform evidence regarding the medium and long-term impact of the programme. If funding is made available, the *PFL* cohort will be re-assessed at 9 years (in primary school), 13 years (early secondary school), 17 years (end of secondary school/ early school leaving), 25 year (early/emerging adulthood), and at 10 year intervals thereafter. This would capitalise on the investments already made in the evaluation and generate evidence on the persistence or fade-out of the effects at school entry.

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