

Preventing Early Deprivation: The North Dublin experiment

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preparing for life
Early Childhood Intervention

+ Deprivation early in life



- SES inequalities in children's development appear early in life (Vignoles-Rueda (2005) for the UK; Carneiro & Heckman. (2003) for US)
- Deprivation early in life is associated with
 - poorer cognitive skills (Duncan and Brooks-Gunn, 1997)
 - less developed social skills (Janus and Duku, 2007)
 - emotional and behavioural problems (McLoyd, 1998)
- Inequalities in skills & capabilities are intergenerational in nature
- Inequalities become larger as children age and are difficult to eradicate



Importance of Early Childhood Intervention



- Targeted early intervention programmes effective way of reducing inequalities (Karoly et al. 2005)
- Early intervention is efficient from both biological and economic perspectives
- Well-designed interventions can generate a return to society ranging from \$1.80 to \$17.07 for each dollar spent
- Argument for early intervention in more generous welfare systems is not rooted in strong empirical evidence



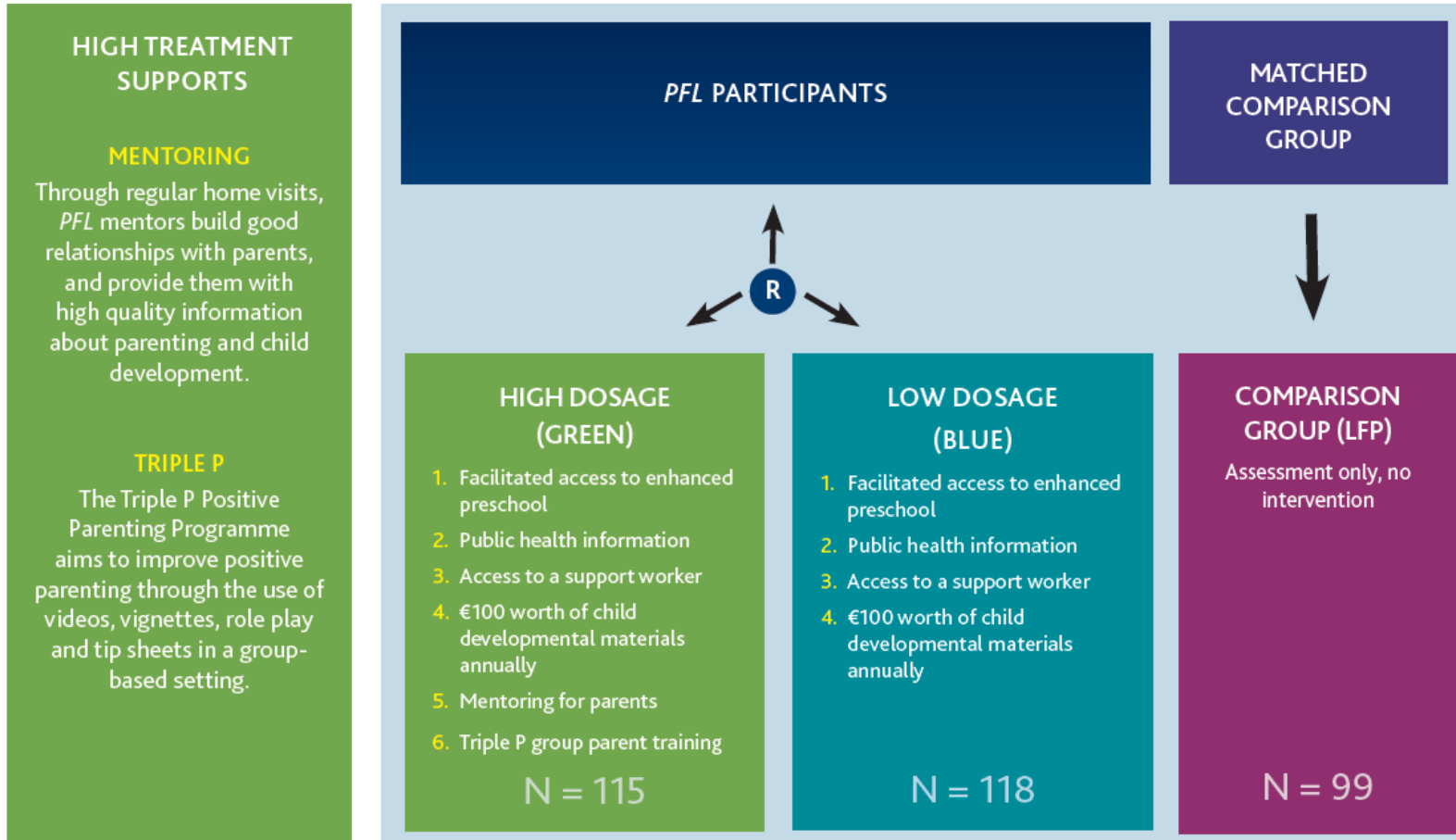
Preparing for Life Programme



- **Community-led initiative:** operated by Northside Partnership in highly disadvantaged area of Dublin, Ireland
- **Bottom-up approach:** community initiative involving 28 community groups, service providers, & local representatives
- **Evidence of need:** Children scored below the norm on cognitive & non-cognitive skills on school entry (Doyle & McNamara, 2011)
- **Aim:** Improve levels of school readiness by assisting parents in developing skills to prepare their children for school
- **Evaluation Design:** RCT & embedded quasi-experimental design



Design of *Preparing for Life*



+ PFL High treatment group



Home-visiting mentoring programme

- Fortnightly home-visits from a trained mentor to support and help parents with key parenting issues from pre-birth to age 5
- **Mentors role:** act as advisors to the participating families & support and educate parents about child development & parenting
- **Mentors backgrounds:** education, social care, youth studies, psychology, and early childcare and education
- Home visits structured around “**Tip Sheets**” - handouts presenting best-practice information relating to child development
 - Developed by *PFL* staff based on available information
 - Each session lasts 30min-2hrs



Evaluation Design



Impact Evaluation

- **Aim:** To determine if the programme/service is effective
- **PFL data collection:** Pre-intervention (baseline), birth, 6mths, 12mths, 18mths, 24mths, 3yrs, 4yrs, school entry

Implementation Evaluation

- **Aim:** Delve into the blackbox of programme effectiveness & evaluate fidelity to the model
- **PFL data collection:**
 1. Implementation data
 2. Focus groups with participants
 3. Semi-structured interviews with programme staff

+ Recruitment & Baseline Assessment



■ Recruitment:

- Recruited 233 pregnant women residing in *PFL* catchment area between Jan 2008-August 2010
- Population-based recruitment rate, *based on all live births during the recruitment phase*, was **52%**

■ Randomisation:

- 115 allocated to **High** treatment group
- 118 allocated to **Low** treatment group

■ Baseline assessment:

- No statistical differences between the high treatment group and low treatment group on 119/123 measures (97%)

+ Selected Baseline Socio-Demographics & Health

	Low Treatment – High Treatment			
Instrument	N (n _{LOW} / n _{HIGH})	M _{LOW} (SD)	M _{HIGH} (SD)	p
Mother's Age	205 (101/104)	25.30 (6.00)	25.46 (5.85)	0.85
First-time Mothers	205 (101/104)	0.50 (0.50)	0.54 (0.50)	0.49
Mother Married	205 (101/104)	0.18 (0.38)	0.14 (0.35)	0.52
Mothers with Low Education	205 (101/104)	0.40 (0.49)	0.34 (0.47)	0.34
Mothers with Primary Degree	205 (101/104)	0.03 (0.17)	0.03 (0.17)	0.86
Mothers Unemployed	205 (101/104)	0.41 (0.49)	0.43 (0.50)	0.71
Residing in Social Housing	204 (101/103)	0.55 (0.50)	0.55 (0.50)	0.97
Long Term Chronic Illness	205 (101/104)	0.08 (0.27)	0.11 (0.31)	0.50
Mental Health Condition	205 (101/104)	0.24 (0.43)	0.28 (0.45)	0.46
Planned Pregnancy	203 (100/103)	0.30 (0.46)	0.29 (0.46)	0.89
Smoking During Pregnancy	205 (101/104)	0.48 (0.50)	0.51 (0.50)	0.66
Drinking During Pregnancy	205 (101/104)	0.29 (0.45)	0.28 (0.45)	0.95

+ Test for Programme Effects – 0-48 months



■ Test for effects across eight main domains

- Child development
- Child health
- Parenting
- Home environment
- Maternal health
- Social support
- Childcare & service use
- Household factors & SES

■ Methods:

- **Permutation based hypothesis testing** (Heckman et al. 2010) to deal with small sample inference
- **Stepdown procedure** (Romano & Wolf, 2005) to deal with multiple hypothesis testing
- **Inverse Probability Weighting** to deal with differential attrition/missing data



Summary of 6M, 12M & 18M Results



PFL Low – PFL High	Proportion of Measures Significantly Different at Six Months		Proportion of Measures Significantly Different at Twelve Months		Proportion of Measures Significantly Different at Eighteen Months	
	Individual Tests	Multiple Hypothesis Tests	Individual Tests	Multiple Hypothesis Tests	Individual Tests	Multiple Hypothesis Tests
Child Development	0%	0%	7%	20%	16%	0%
Child Health	10%	0%	26%	25%	24%	67%
Parenting	23%	20%	0%	0%	20%	50%
Home Environment	36%	50%	0%	0%	33%	50%
Maternal Health & Wellbeing	5%	25%	4%	25%	5%	0%
Social Support	38%	0%	43%	0%	8%	0%
Childcare	7%	0%	~	~	0%	0%
Household Factors & SES	0%	0%	0%	0%	6%	0%
Total Statistically Different	14% (23/160)	12% (3/25)	9% (12/140)	13% (3/23)	14% (21/152)	15% (4/27)

+ IMPACT OF PFL ON: CHILD DEVELOPMENT @ 6, 12, 18 MONTHS

ASQ Scores	6 Months				12 Months				18 Months			
	M_{HIGH} (SD)	M_{LOW} (SD)	$P(i)$	$P(ii)$	M_{HIGH} (SD)	M_{LOW} (SD)	$P(i)$	$P(ii)$	M_{HIGH} (SD)	M_{LOW} (SD)	$P(i)$	$P(ii)$
ASQ Gross Motor Score	40.78 (11.93)	38.50 (12.99)	0.117	0.441 ¹	42.07 (18.34)	40.72 (18.27)	0.319	0.721 ³	56.31 (5.44)	53.72 (12.02)	0.047	0.204 ¹
ASQ Communication	53.07 (7.84)	51.78 (8.49)	0.154	0.483 ²	49.88 (10.74)	50.18 (10.55)	0.575	0.783 ⁵	45.69 (13.16)	45.34 (13.96)	0.437	0.636 ⁵
(-)ASQ Social-Emotional Score	14.76 (10.68)	15.17 (13.75)	0.403	0.800 ⁴	23.48 (21.51)	21.14 (16.05)	0.779	0.779 ⁶	29.13 (19.92)	29.05 (31.84)	0.506	0.506 ⁶
ASQ Personal Social Score	46.36 (12.07)	45.94 (13.57)	0.418	0.709 ⁵	49.88 (8.82)	48.55 (10.46)	0.190	0.559 ²	50.88 (7.91)	49.46 (9.24)	0.160	0.475 ²
ASQ Fine Motor Score	50.85 (9.52)	51.39 (10.17)	0.638	0.816 ⁶	54.33 (8.63)	51.87 (10.29)	0.050	0.219 ¹	54.13 (8.26)	53.38 (8.28)	0.291	0.644 ³
ASQ Problem Solving Score	51.87 (9.39)	52.56 (9.92)	0.679	0.679 ⁷	46.40 (11.71)	46.40 (13.13)	0.499	0.826 ⁴	45.69 (11.06)	45.07 (10.69)	0.369	0.669 ⁴

P(i)= one-tailed p value from an individual permutation test with 100,000 replications.

P(ii)= one-tailed p value from a Step-down permutation test with 100,000 replications and the subscripts indicate the ordering in which the variables are dropped in the Step-down analysis.

+ IMPACT OF PFL ON: CHILD DEVELOPMENT @ 6, 12, 18 MONTHS



Instrument	6 Months				12 Months				18 Months			
	M_{HIGH} (SD)	M_{LOW} (SD)	$P(i)$	$P(ii)$	M_{HIGH} (SD)	M_{LOW} (SD)	$P(i)$	$P(ii)$	M_{HIGH} (SD)	M_{LOW} (SD)	$P(i)$	$P(ii)$
Communicative Development Inventory												
First Signs of Understanding	-	-	-	-	2.97 (0.16)	2.96 (0.20)	0.308	0.508 ¹	2.99 (0.11)	2.94 (0.37)	0.178	0.300 ¹
First Communicative Gestures	-	-	-	-	9.01 (2.23)	9.78 (1.96)	0.986	0.986 ²	11.27 (1.37)	11.41 (1.26)	0.740	0.740 ²
Brief Infant-Toddler Social and Emotional Assessment												
BITSEA Competence Score	-	-	-	-	15.44 (3.41)	14.88 (3.57)	0.154	0.274 ¹	17.85 (2.61)	17.59 (3.45)	0.305	0.461 ¹
(-)BITSEA Problem Score	-	-	-	-	8.82 (5.74)	8.90 (6.49)	0.466	0.466 ²	9.44 (6.63)	9.14 (7.18)	0.606	0.606 ²
Other Measures												
(-)Difficult Temperament	11.70 (5.71)	12.21 (5.50)	0.275	-	12.60 (5.54)	13.30 (5.76)	0.216	-	-	-	-	-
DP3: Cognitive development standardised score	-	-	-	-	116.20 (13.66)	115.13 (16.03)	0.323	-	119.01 (15.83)	114.57 (17.81)	0.053	-

P(i)= one-tailed p value from an individual permutation test with 100,000 replications.

P(ii)= one-tailed p value from a Step-down permutation test with 100,000 replications and the subscripts indicate the ordering in which the variables are dropped in the Step-down analysis.

+ IMPACT OF PFL ON: HOME ENVIRONMENT @ 6 & 18 MONTHS

Instrument	6 Months				18 Months			
<i>HOME Scores</i>	M_{HIGH} (SD)	M_{LOW} (SD)	$P(i)$	$P(ii)$	M_{HIGH} (SD)	M_{LOW} (SD)	$P(i)$	$P(ii)$
Variety	3.54 (1.12)	3.11 (1.01)	0.005	0.030 ¹	4.08 (1.00)	3.99 (1.05)	0.309	0.493 ⁵
Learning Materials	6.88 (1.65)	6.26 (1.72)	0.021	0.097 ²	8.24 (0.97)	8.04 (1.12)	0.176	0.467 ³
Responsivity	8.83 (1.73)	8.55 (2.32)	0.276	0.690 ³	9.50 (1.59)	9.07 (2.08)	0.144	0.455 ²
Acceptance	6.36 (0.56)	6.36 (0.60)	0.484	0.856 ⁴	6.12 (0.80)	5.66 (1.45)	0.035	0.176 ¹
Organisation	5.57 (0.64)	5.58 (0.66)	0.543	0.768 ⁵	5.52 (0.69)	5.45 (0.78)	0.290	0.590 ⁴
Involvement	4.28 (1.25)	4.40 (1.25)	0.697	0.697 ⁶	3.88 (1.47)	4.23 (1.56)	0.872	0.872 ⁶
<i>HOME & SHIF Scores</i>								
Childcare	4.19 (0.59)	3.94 (0.82)	0.013	0.095 ¹	3.84 (0.77)	3.77 (0.79)	0.299	0.692 ⁵
Toys and Books	7.75 (1.75)	7.28 (1.80)	0.042	0.314 ²	9.36 (0.92)	9.32 (1.03)	0.399	0.603 ⁷
Daily Routines	7.36 (1.40)	7.13 (1.23)	0.129	0.527 ³	8.14 (1.31)	8.11 (1.20)	0.437	0.437 ⁸
Play	7.24 (1.62)	7.03 (1.44)	0.191	0.584 ⁴	7.22 (1.60)	7.13 (1.75)	0.369	0.687 ⁶
Interaction	11.50 (1.99)	11.26 (2.75)	0.338	0.822 ⁵	12.13 (2.08)	11.43 (2.91)	0.101	0.453 ²
Physical Environment	6.16 (1.11)	6.08 (1.13)	0.343	0.777 ⁶	6.39 (1.35)	6.02 (1.44)	0.107	0.439 ³
Outings	4.76 (0.46)	4.80 (0.43)	0.683	0.866 ⁷	4.78 (0.53)	4.69 (0.60)	0.172	0.557 ⁴
Restrictions/Not Items	5.97 (0.18)	5.99 (0.12)	0.781	0.781 ⁸	5.61 (0.64)	5.33 (1.21)	0.089	0.453 ¹
<i>Other Measures</i>								
Total HOME SHIF	16.94 (1.38)	16.61 (1.31)	0.099	-	17.40 (1.98)	17.04 (2.08)	0.209	-
Framingham Safety Survey	7.37 (0.77)	7.46 (0.68)	0.782	-	8.32 (0.98)	8.33 (0.93)	0.505	-
Interaction With Baby	2.79 (0.61)	2.66 (0.53)	0.082	-	3.21 (0.48)	3.05 (0.47)	0.020	-



Attrition & Dosage



■ Attrition/disengagement

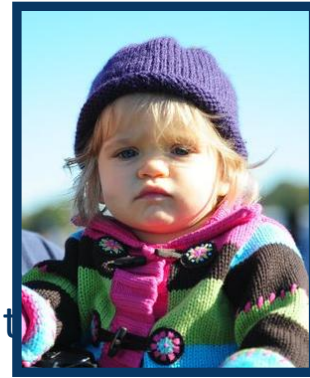
- Attrition may bias evaluation results if non-random
- 30% of high treatment & 37% of low treatment dropped out/disengaged between randomisation & 18 months
- Few individual characteristics predict attrition – IQ more important

■ Dosage/engagement

- Variation in dosage, may lead of variation in effect
- On average, high treatment group received 27 home visits of ~1 hr in duration between pregnancy & 18 months
 - 55% of prescribed visits delivered based on bi-weekly visits
- Higher maternal IQ associated with higher engagement



Conclusions to date



- Few significant effects, yet consistent with literature
 - Child development, child health, parenting and home environment
 - Corresponded directly to information on the PFL Tip Sheets
- No significant impact on many key domains such as birth weight, breastfeeding, maternal well-being etc.
- Attrition & disengagement between 12 & 18 months very low
- Engagement below prescribed dosage
- Oldest *PFL* child is 4 years and old & youngest is 24 months
- Evaluation will continue until all children start school

Programme website: www.preparingforlife.com

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

+ 'Preparing for Life' Team



- **Research team:** Orla Doyle, Eysin Palamaro Munsell, Judy McGrath, Ailbhe Booth, Edel McGlanaghy, Catherine O'Melia, Caitriona Logue, Seong Moon
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