Gender Differences in Cognitive Development and School Readiness: Findings from a Randomised Controlled Trial of Children from Communities of Socio-economic Disadvantage in Ireland

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Ever-increasing attention on early intervention and prevention programmes in Ireland, focused on areas designated as socio-economically disadvantaged (McAvoy, Purdy, Sneedon & Mac Evilly, 2013).

These programmes aim to reduce the negative effects of childhood adversities.

In understanding developmental trajectories in early childhood, one factor that requires careful consideration is gender and whether differences exist between boys and girls in early childhood development (Ertem et al., 2018).
Cognitive Development

- comprehending the world
- thinking logically
- problem solving
- analysing and interpreting information

Associated with many favourable outcomes later in life, such as better academic achievement in adolescence, higher educational attainment throughout life, fewer mental health problems and less time spent unemployed (Batty, Deary, & Gottfredson, 2007; Bornstein, Hahn, & Wolke, 2013; Hofer & Clouston, 2014).
School Readiness

How ready children are:

- socially
- physically
- intellectually

Associated with more positive experiences transitioning to the formal education system (Mistry, Benner, Biesanz, Clark & Hows, 2010), higher levels of academic achievement and better behavioural outcomes (Welsh, Nik, Blair, Bierman & Nelson, 2010), better relationships (McClelland, Acock, & Morrison, 2006) and better long term outcomes (Karoly, Kilburn, & Cannon, 2005).
Gender and Cognitive Development

Palejwala and Fine (2015) utilised the *Wechsler Primary and Preschool Scale of Intelligence* with a sample of children between the ages of two and seven years, finding evidence of girls outperforming boys in this early childhood stage.

von Stumm and Plomin (2015) found significant gender differences in *intelligence* favouring girls in early childhood (between 2 and 4 years of age) with this difference disappearing in later childhood and adolescence and was no longer evidenced at the age of 16.

Toivainen, Papageorgiou, Tosto and Kovas (2017) found that girls of two to four years of age had statistically significantly stronger verbal and *non-verbal abilities* than boys; however, by later childhood (between 10 and 12 years of age) boys outperformed girls in non-verbal abilities.

An advantage on behalf of girls has been evident in specific domains of cognitive abilities, such as *processing speeds* (Palejwala & Fine, 2015) and *verbal memory* (Merrill, Yang, Roskos, & Steele, 2016).

On the contrary, boys have been found to have stronger *visual processing* (Palejwala & Fine, 2015) and *spatial ability* skills (Merrill et al., 2016).
Gender and School Readiness

Isaacs (2012) found that the typical five-year-old girl in the US is on average 16 points ahead of the typical five-year-old boy in the area of school readiness.

In Ireland, it was reported that the majority of early years’ educators and teachers rated girls as more school ready than boys on their emotional readiness, independence, maturity and organisational skills (Ring et al., 2016).

Girls have also been found to be advantageous in their emotional expression (Chaplin and Aldao, 2013), emotional development (Maguire, Neins, McCann and Connolly, 2016), socio-emotional development (Masnjak, 2017) and social competence (Barbu, Cabanes & Le Maner-Idrissi, 2011).

Boys have an advantage in their physical activity levels, indicating that they may be more physically ready to start formal schooling (Masnjak, 2017).
Current Study

Aims to examine whether boys and girls differ in their developmental trajectories across the areas of cognitive development and school readiness behaviours.

The research also aims to examine whether a high intensity early intervention and prevention programme is effective in reducing any such gender differences.
Research Questions

1. Do boys and girls at four years of age differ in their cognitive development?
2. Do boys and girls at five years of age differ in their school readiness?
3. Does a high intensity early intervention programme reduce gender discrepancies in cognitive abilities at four years of age and school readiness at five years of age?
Methodology

- Secondary analysis of the Preparing For Life data
- Preparing For Life is a randomised controlled trial involving a low and a high intensity intervention group
- Between 2008 and 2010, a total of 233 women were recruited
  - 118 were assigned to the low treatment group
  - 115 were assigned to the high treatment group
Outcome variable (I)

*Cognitive development*

British Ability Scales II at 4 years of age
- Psychometric test of general thinking and reasoning skills providing an overview of cognitive strengths and weaknesses of children aged three to 17 years
- General Conceptual Ability score
  - *Verbal Ability*
  - *Pictorial Reasoning*
  - *Spatial Ability*
- N=128 children
Outcome variable (II)

**School Readiness**

Short-form (48-item) of the Early Development Instrument at school entry

Five domains and 15 subdomains of school readiness:
- Physical health and well-being domain
- Social competence domain
- Emotional maturity domain
- Language and cognitive development domain
- Communication and general knowledge domain
- N=134 children
Gender differences in cognitive development domains within treatment groups

<table>
<thead>
<tr>
<th></th>
<th>Low treatment</th>
<th>High treatment</th>
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<tbody>
<tr>
<td>Verbal ability</td>
<td>91.00</td>
<td>94.56</td>
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<tr>
<td>Pictorial reasoning</td>
<td>90.23</td>
<td>94.61</td>
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<tr>
<td>Spatial ability</td>
<td>81.05</td>
<td>90.40</td>
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Note: boys girls
*statistically significant gender differences in blue font
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Gender differences in school readiness domains within treatment groups

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<thead>
<tr>
<th>Domain</th>
<th>Low treatment</th>
<th>High treatment</th>
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<tbody>
<tr>
<td>Physical health and well-being</td>
<td>7.70</td>
<td>8.24</td>
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<tr>
<td>Social competence</td>
<td>7.45</td>
<td>8.03</td>
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<tr>
<td>Emotional maturity</td>
<td>8.66</td>
<td>8.46</td>
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<tr>
<td>Language and cognitive development</td>
<td>6.01</td>
<td>8.23</td>
</tr>
<tr>
<td>Communications skills and general knowledge</td>
<td>6.75</td>
<td>5.81</td>
</tr>
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Note: boys girls
*statistically significant gender differences in blue font
Discussion

• Gender advantage in favour of girls across all domains of cognitive development and school readiness behaviours, which contradicted previous research suggesting an advantage of boys in the cognitive domain of spatial ability (Merrill et al., 2016) and the school readiness domain of physical development (Masnjak, 2017).

• Given the focus of the current study on a sample of children from an area of socio-economic disadvantage, it may be that boys have less opportunities to develop in these domains.

• Evidence of the gender disparity across both treatment groups possibly indicates that the interventions being delivered in early childhood may not adequately address gender gaps in these areas.
Whilst an abundance of research has highlighted the effect of socio-economic status on school readiness behaviours, the examination of within-group differences in school readiness for children from areas of socio-economic disadvantage allows for greater understanding of the factors which may result in children showing positive development in these domains.

- May suggest that boys have less opportunities to develop in these domains.
References


Any Questions?
Thank you for listening.

We hope our findings will contribute to a growing body of literature in an Irish context allowing us to support the development of resilient children.