Growing Up in Ireland
National Longitudinal Study of Children




13th Annual Research Conference 2021

The influence of preterm birth on language outcomes: The role of non-linguistic abilities, parental mental wellbeing, and parent-child relationships.

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ESRI ECONOMIC & SOCIAL RESEARCH INSTITUTE

Trinity College Dublin
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An Roinn Leanaí, Comhionannais, Míchumais, Lánpháirtíochta agus Óige
Department of Children, Equality, Disability, Integration and Youth

Presentation Overview

1. **Background**
   - Preterm birth in the Irish context
   - “High prevalence/Low severity” developmental difficulties
2. **Research Objectives & Methodology**
   - Aims and theoretical perspectives
   - Applied relevance
   - Analyses
3. **Findings**
4. **Policy Implications**
5. **Future Research**

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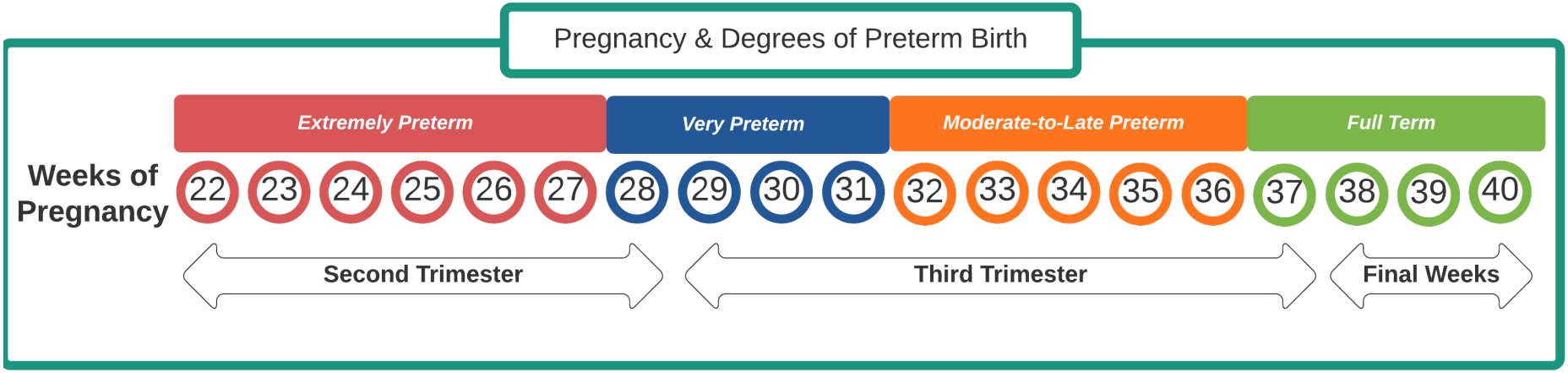
BACKGROUND

Preterm Birth



Over 4,500 babies are born preterm in Ireland every year (HSE, 2018), making up 6-7% of all live births (EFCNI, 2012).

“High prevalence/low severity” problems

(Aylward, 2014, p.392).

Medical advances →

- Lower prevalence of **‘high severity’** problems (e.g., cerebral palsy), but ...
- persistence of **‘low severity’** problems (e.g., language difficulties, attention deficit hyperactivity disorder).

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Medical advances →

- Lower prevalence of **'high severity'** problems (e.g., cerebral palsy), but ...
- persistence of **'low severity'** problems (e.g., language difficulties, attention deficit hyperactivity disorder).

In Ireland, the development of high-risk preterm infants is assessed at 2 years of age (with variations between hospitals in the definition of 'high risk' and the assessments used).

Language Difficulties

Difficulties with **expressive** and **receptive** language are found among preterm-children across **infancy, childhood, and adolescence** (Barre et al., 2011; Cattani et al., 2010; Luu et al., 2011; van Noort-van der Spek et al., 2011).

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As language difficulties can have **cascading effects on later school performance** (Bleses et al., 2016), it is critical that we prevent the emergence of language difficulties and advance their early identification and treatment.

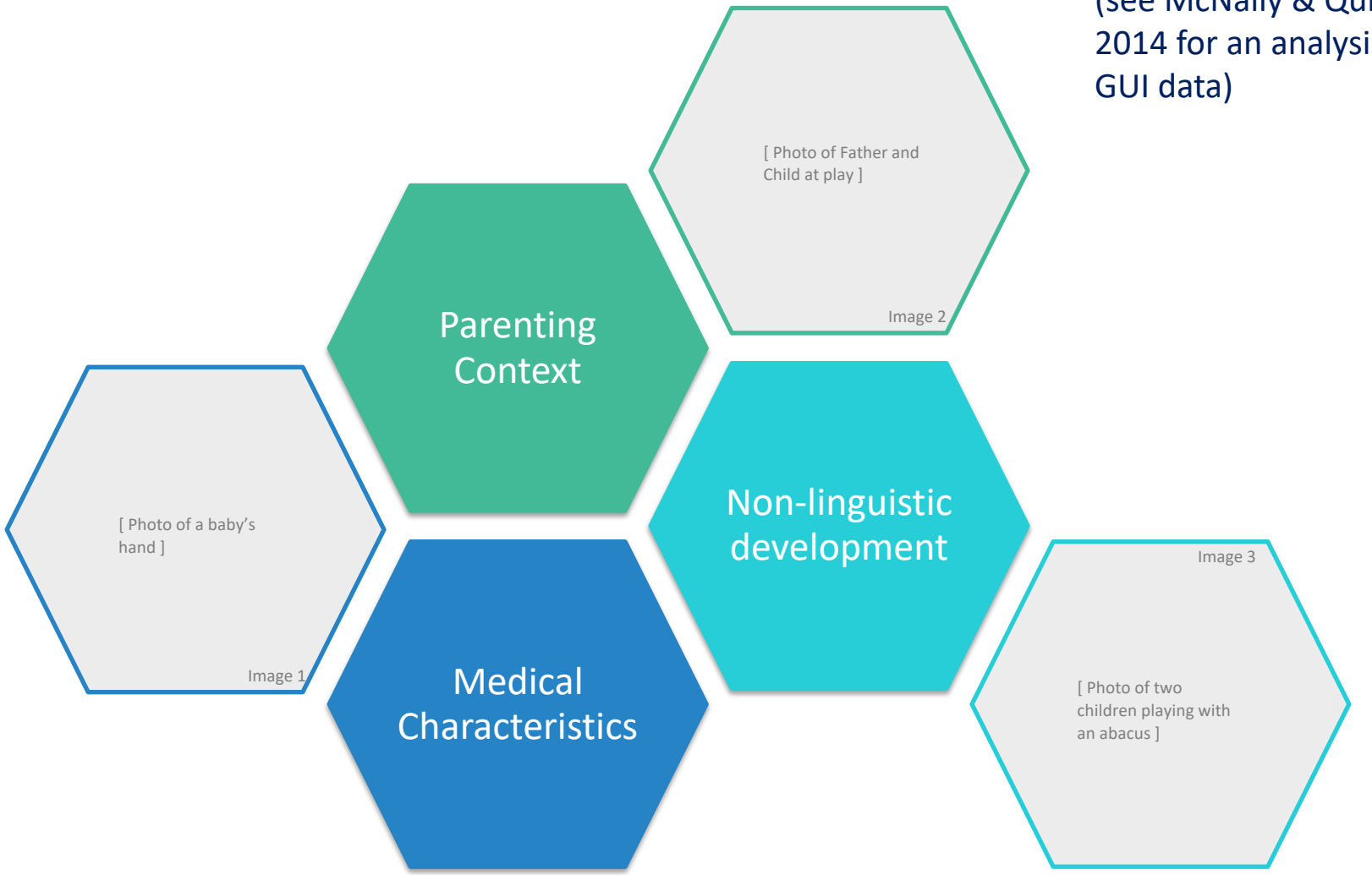
Language Difficulties

Large inter-individual variability in the language abilities of preterm-born children (Sansavini et al., 2011).

Identifying the risk/protective factors underlying this variability will assist in screening for high-risk children and in developing effective interventions.

Risk/Protective Factors

(see McNally & Quigley, 2014 for an analysis of GUI data)



Images from:
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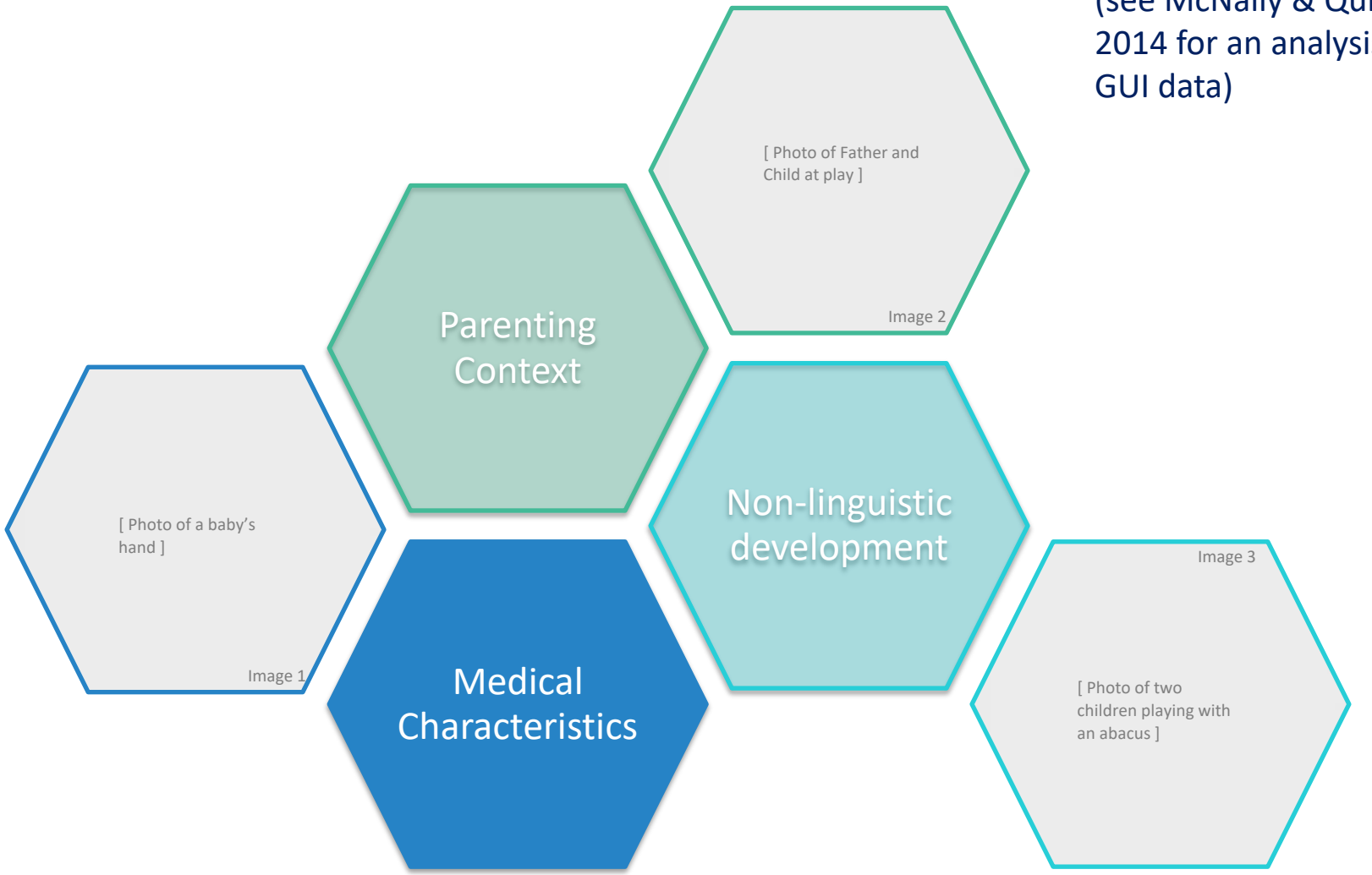

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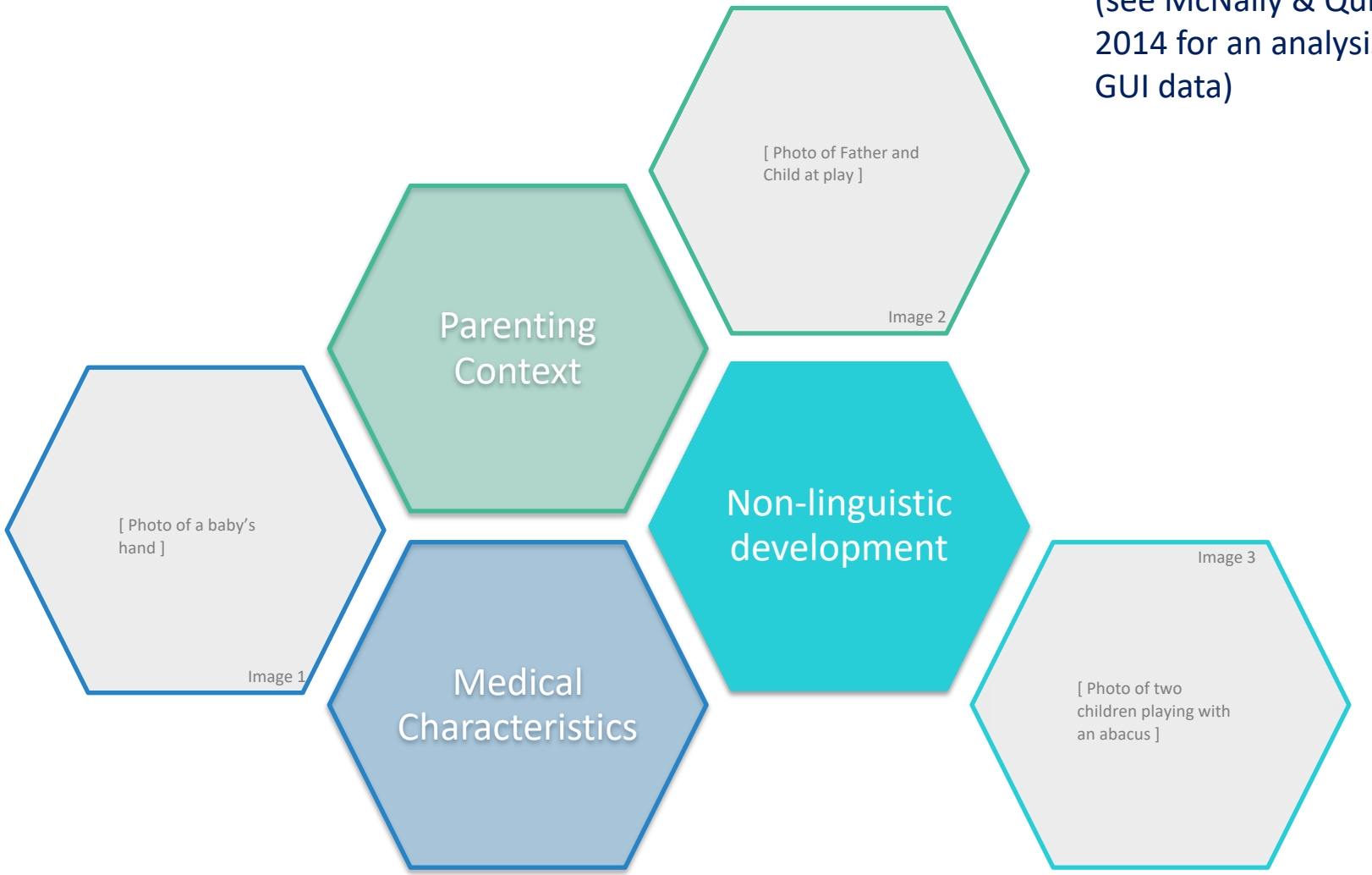

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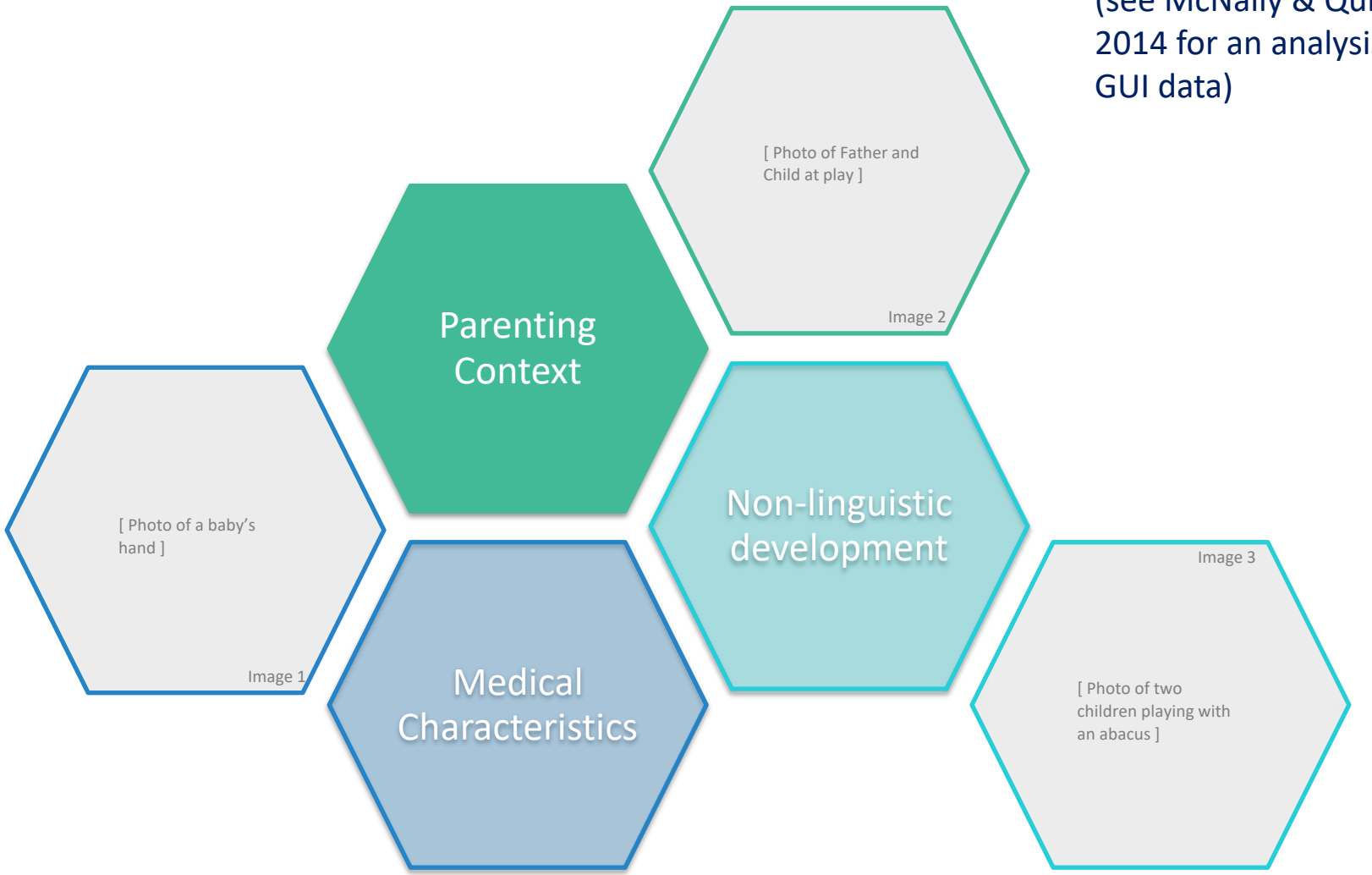

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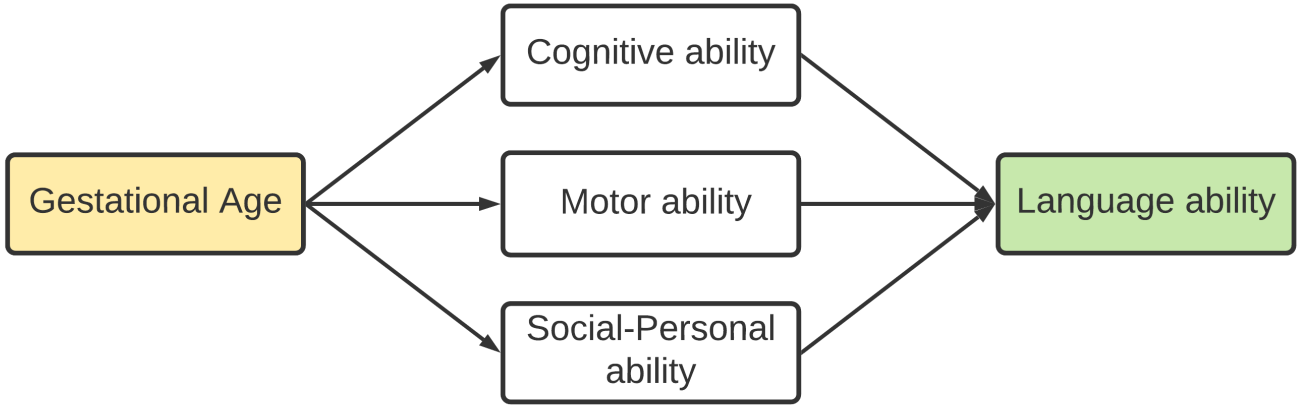
Non-Linguistic Difficulties

Language outcomes may be shaped by the **non-linguistic difficulties** of preterm-born children:



Parenting Context

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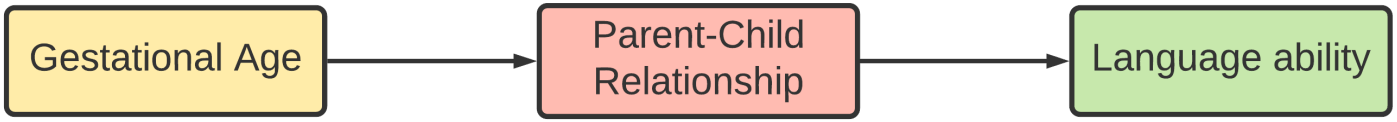

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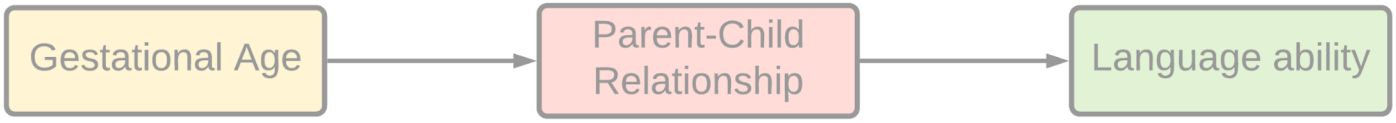

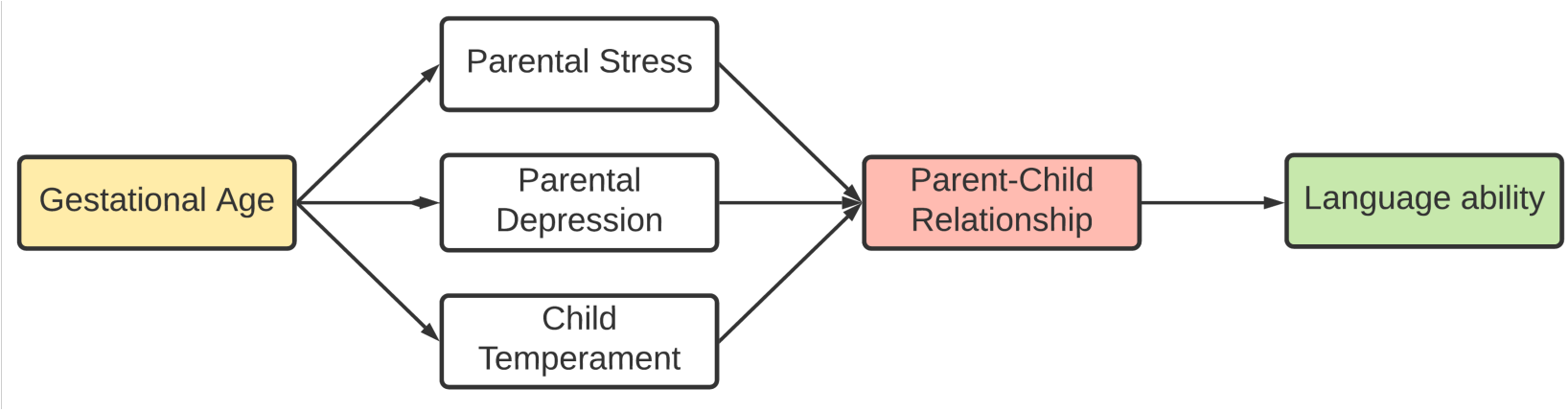

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RESEARCH OBJECTIVE AND METHODOLOGY

Research Objective

To examine how preterm birth may shape expressive language outcomes via its influence on developmental risk/protective factors which encompass the parenting context and the child's non-linguistic characteristics.

Key theoretical perspectives:

- Developmental cognitive linguistic perspective (Ibbotson, 2020).
- Transactional model of development (Fiese & Sameroff, 1989).

Applied Relevance

To advance our understanding of the factors that shape the language outcomes of preterm children in order to improve

a) **screening** and **prevention**

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a) **screening** and **prevention**
b) **intervention** and **service referral** procedures.

To apply this knowledge in the **Irish context** to

a) improve how routine developmental assessments of preterm children are carried out, and
b) achieve a more coordinated approach to the long-term care of preterm children.

Method

GUI cohort: Infant cohort – Waves 1, 2, and 3

→ **Subset:** 8,712 families (538 preterm) that participated at all three waves.

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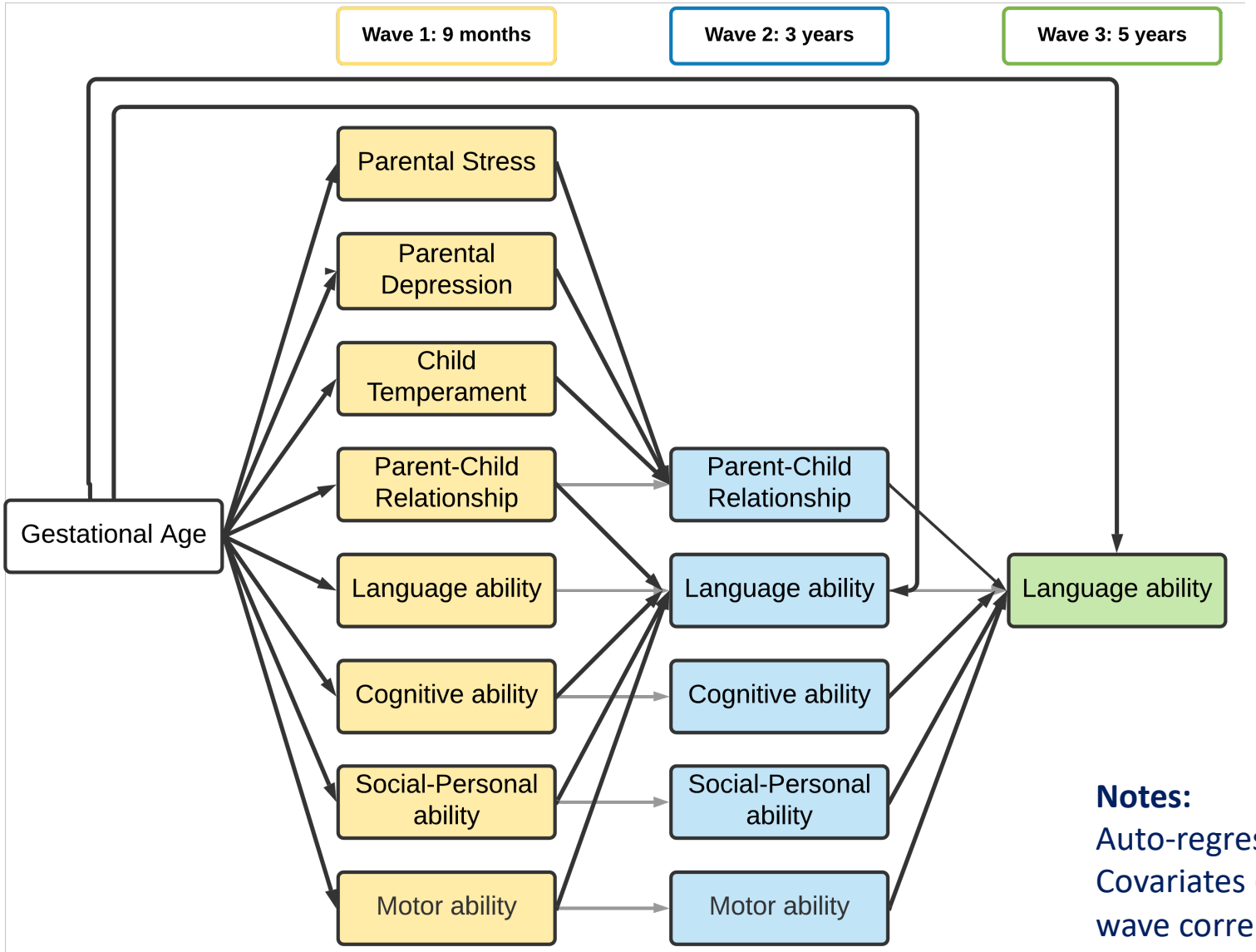
Statistical software: R

Data pre-processing:

- **Weighting:** WGT_5YRb survey weight
- **Missing data treatment:** multivariate imputation by chained equations.

Hypothesised Model



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Auto-regressive paths in grey.
Covariates (income) and within-wave correlations not shown.

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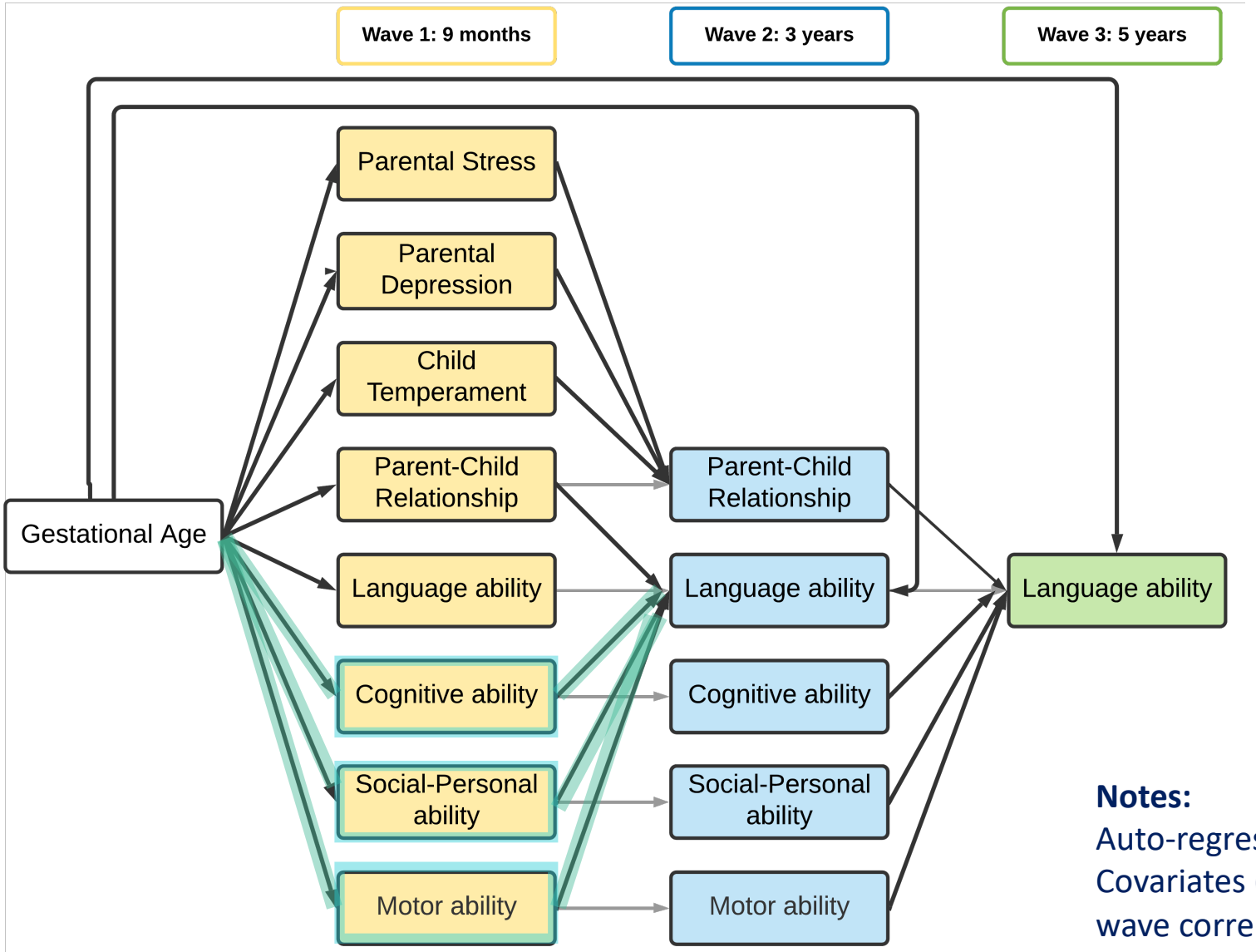

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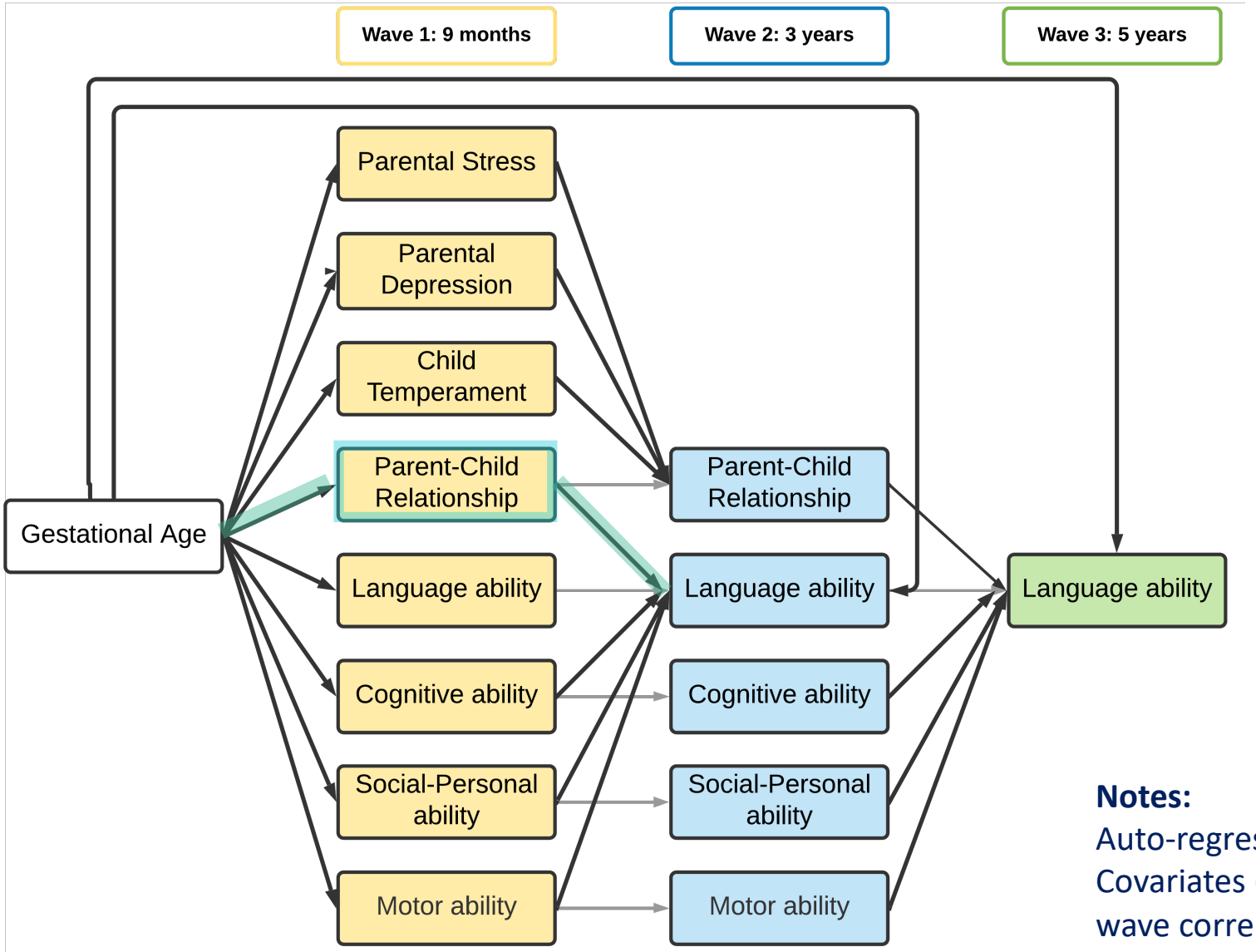

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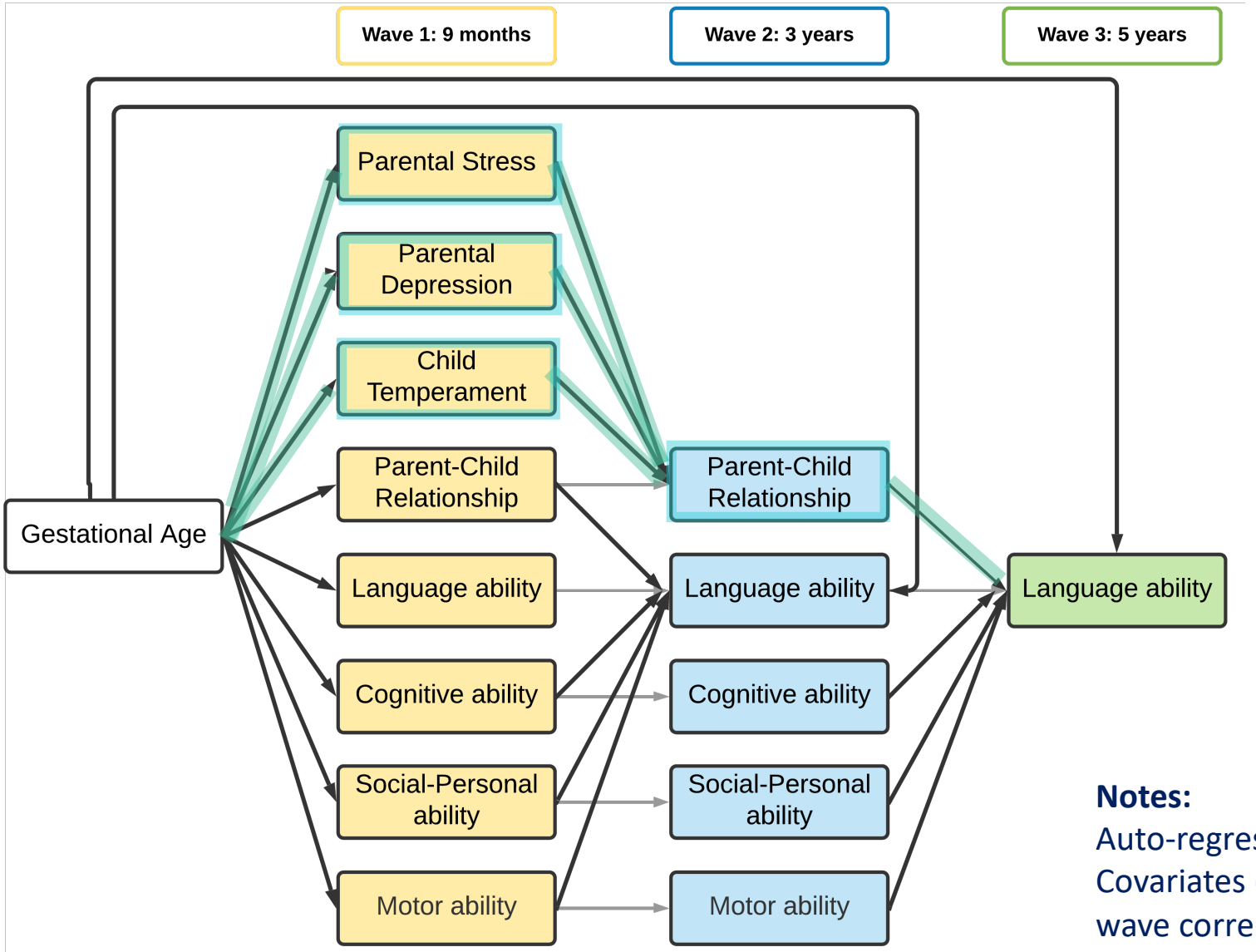

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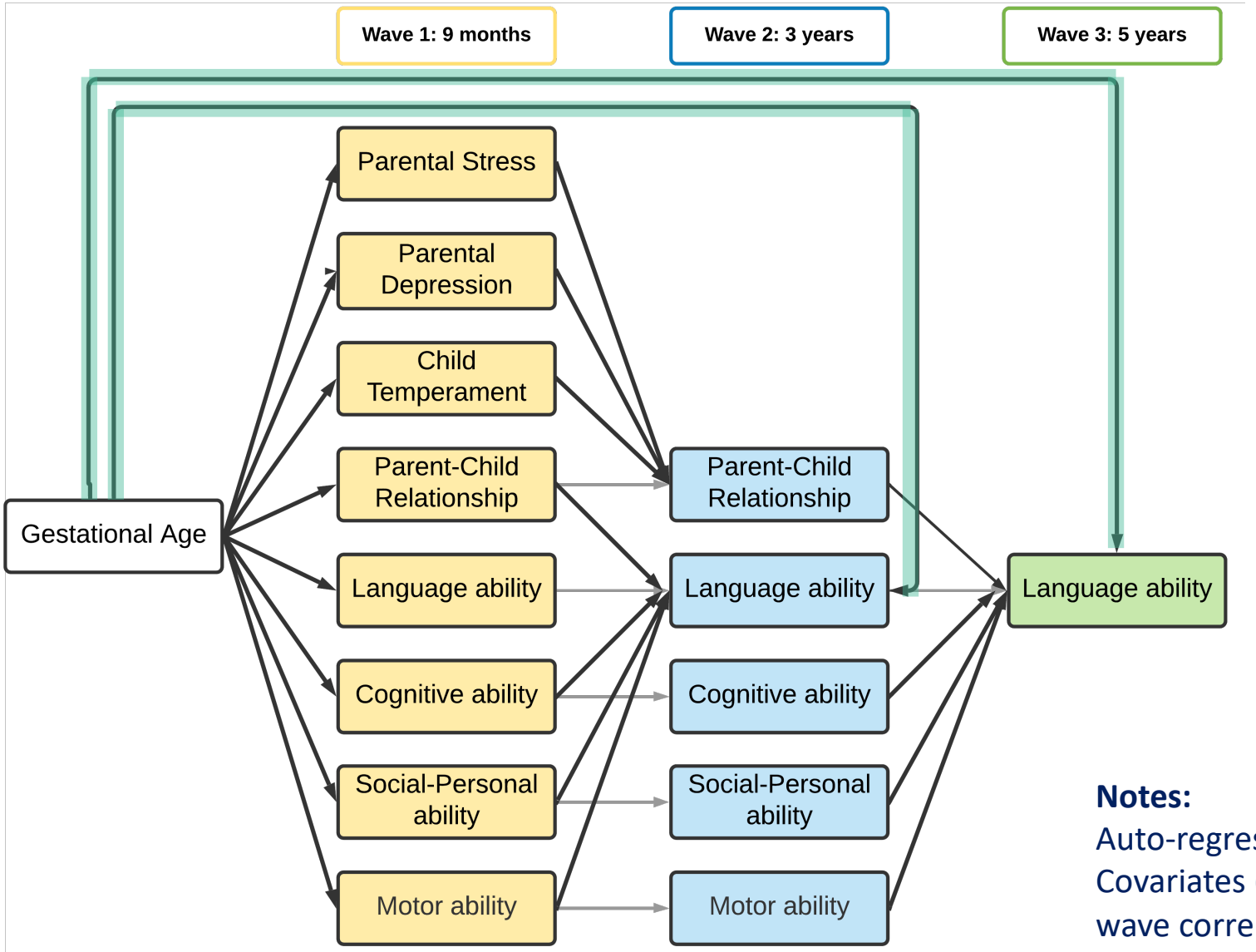

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Analytical Approach

Two structurally identical models: One with 'parental' variables (stress, depression, parent-child relationship) related to the mother, and the other with corresponding variables related to the father.

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Model fitting approach: Model generation approach (with iterative modifications).

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Model fitting approach: Model generation approach (with iterative modifications).

Model fit criteria (Hu & Bentler, 1999):

- Root mean square error of approximation (RMSEA): < .06
- Standardised root mean square residual (SRMR): < .08
- Comparative fit index (CFI): > .95
- Tucker-Lewis index (TLI): > .95

Critical threshold: $p < .05$

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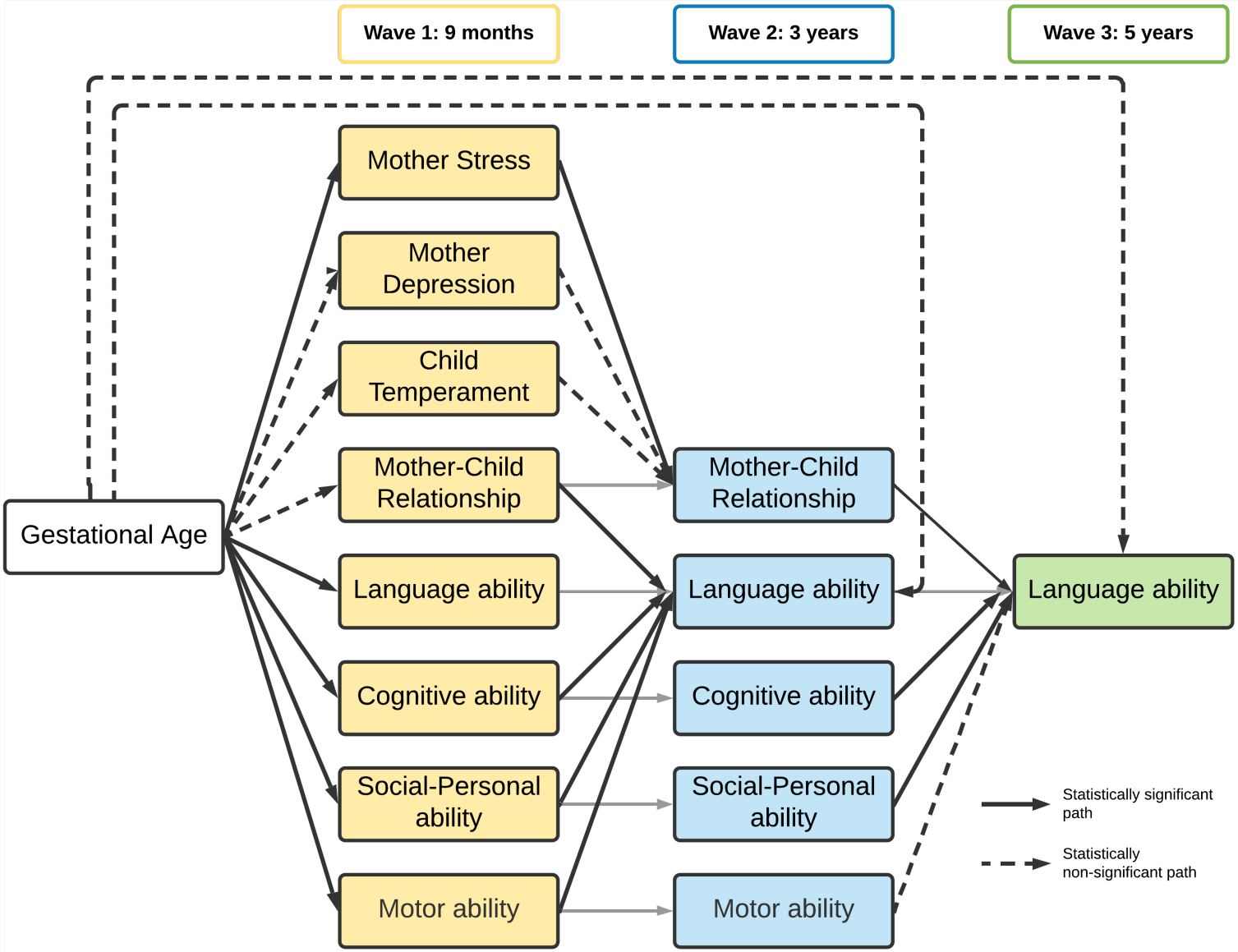
FINDINGS

‘Mother’ model (*N* = 8,712)



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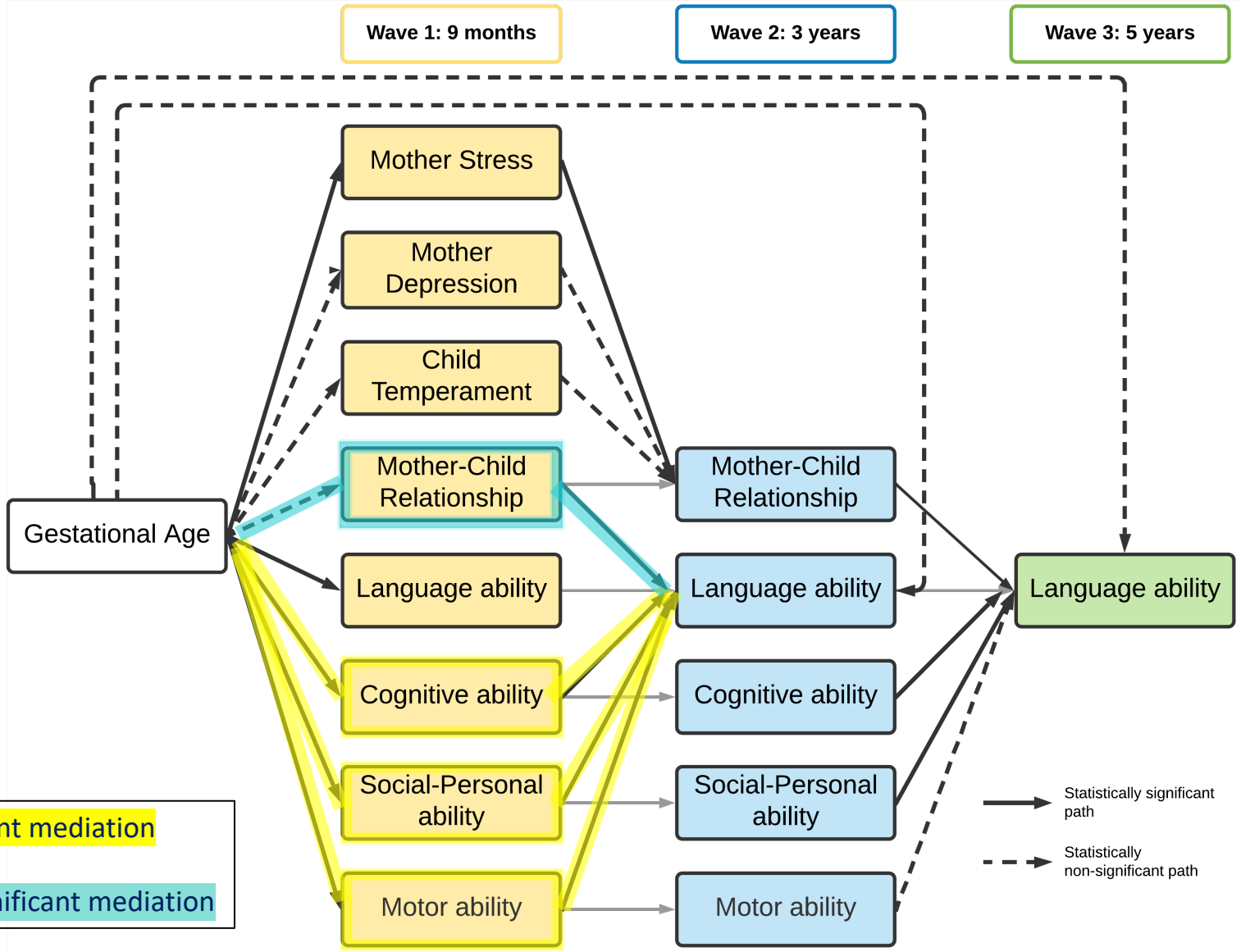

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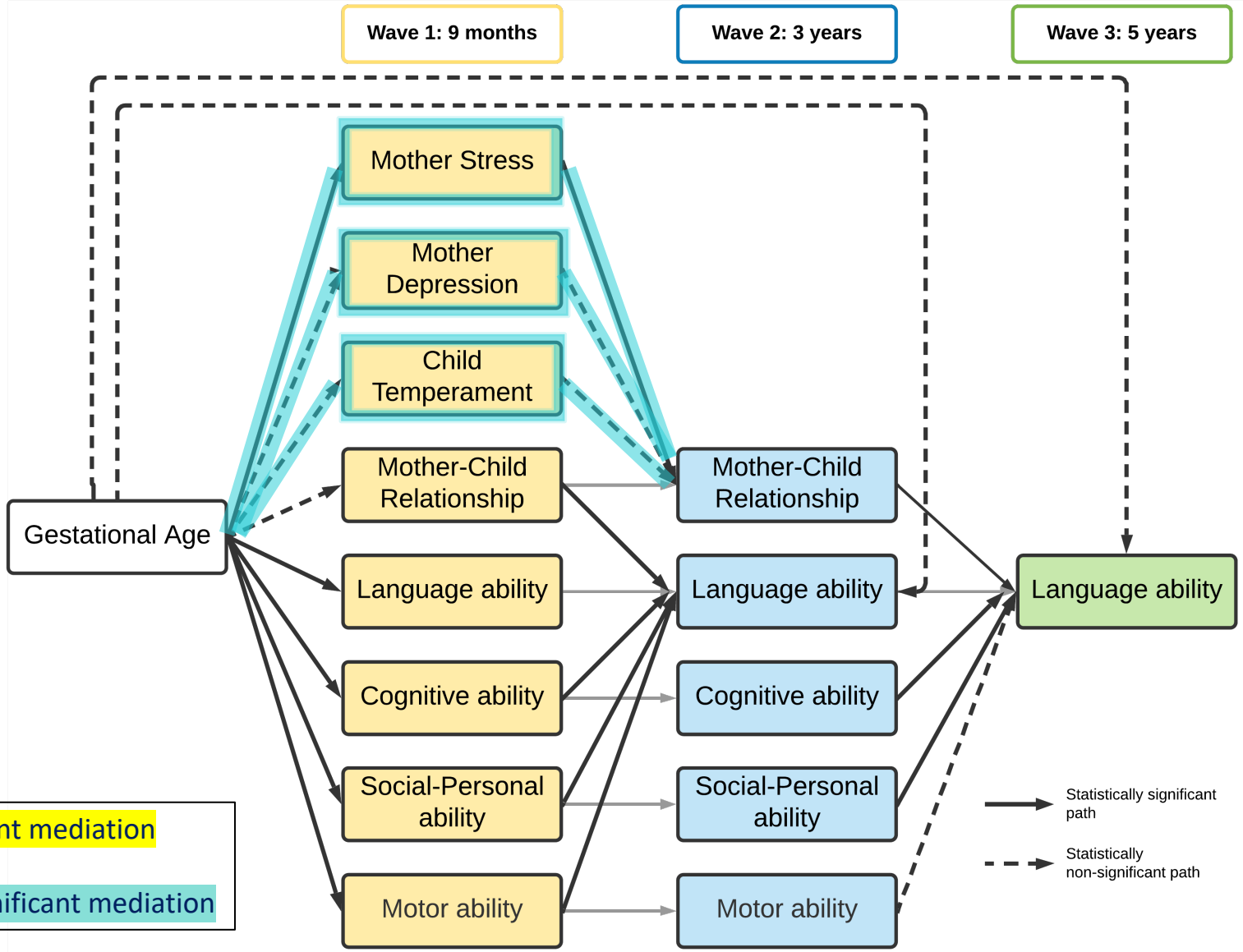
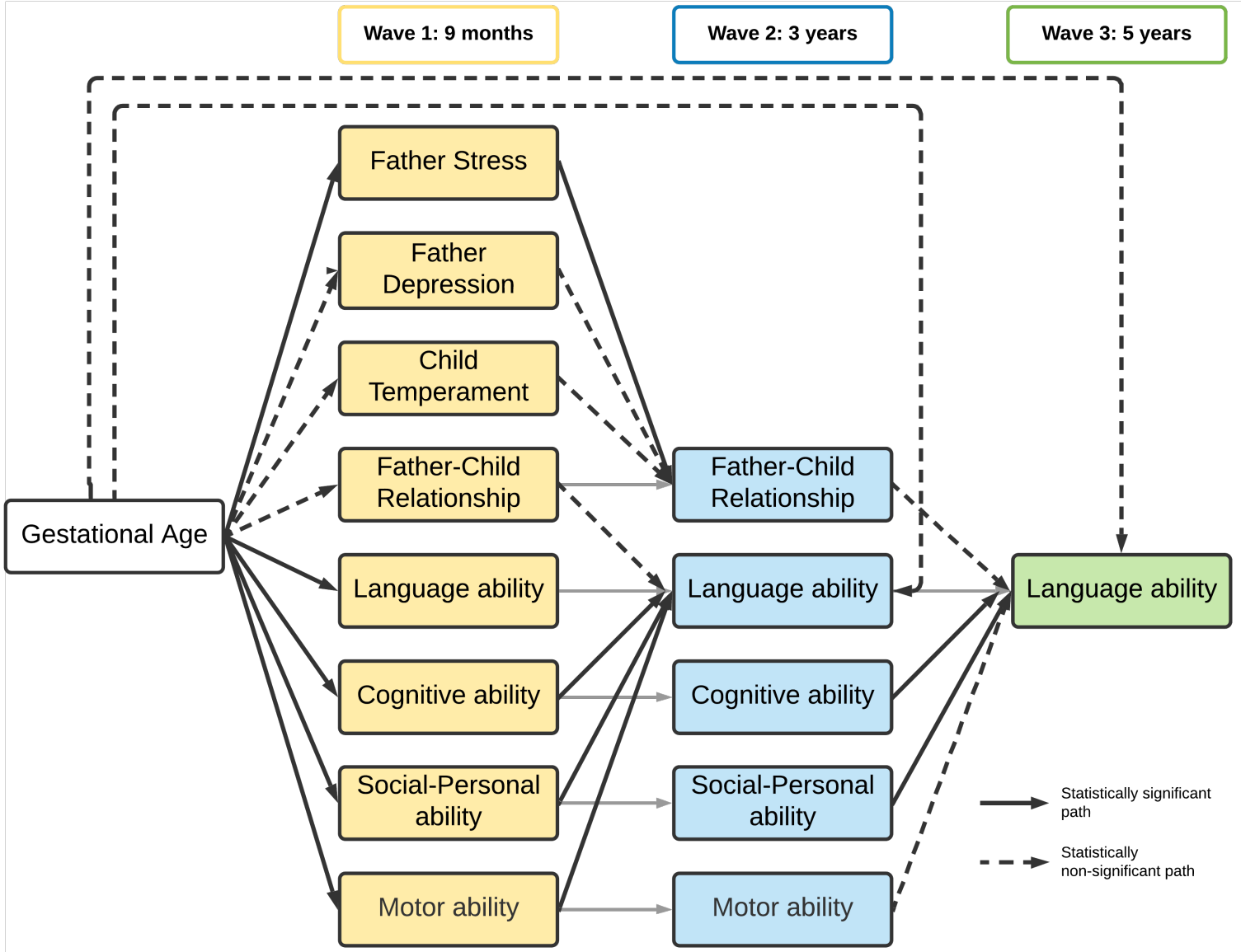


‘Father’ model (*N* = 6,346)



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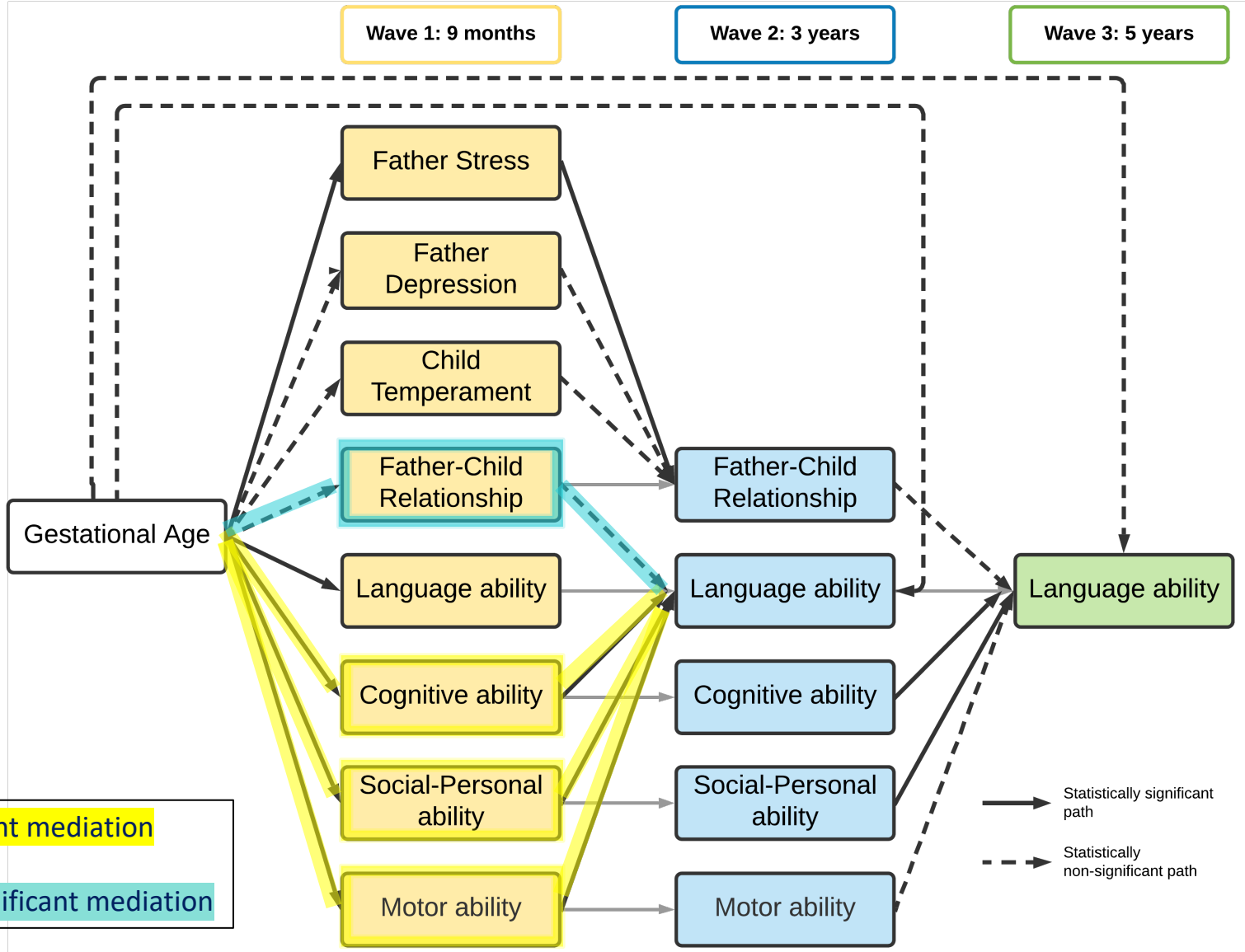

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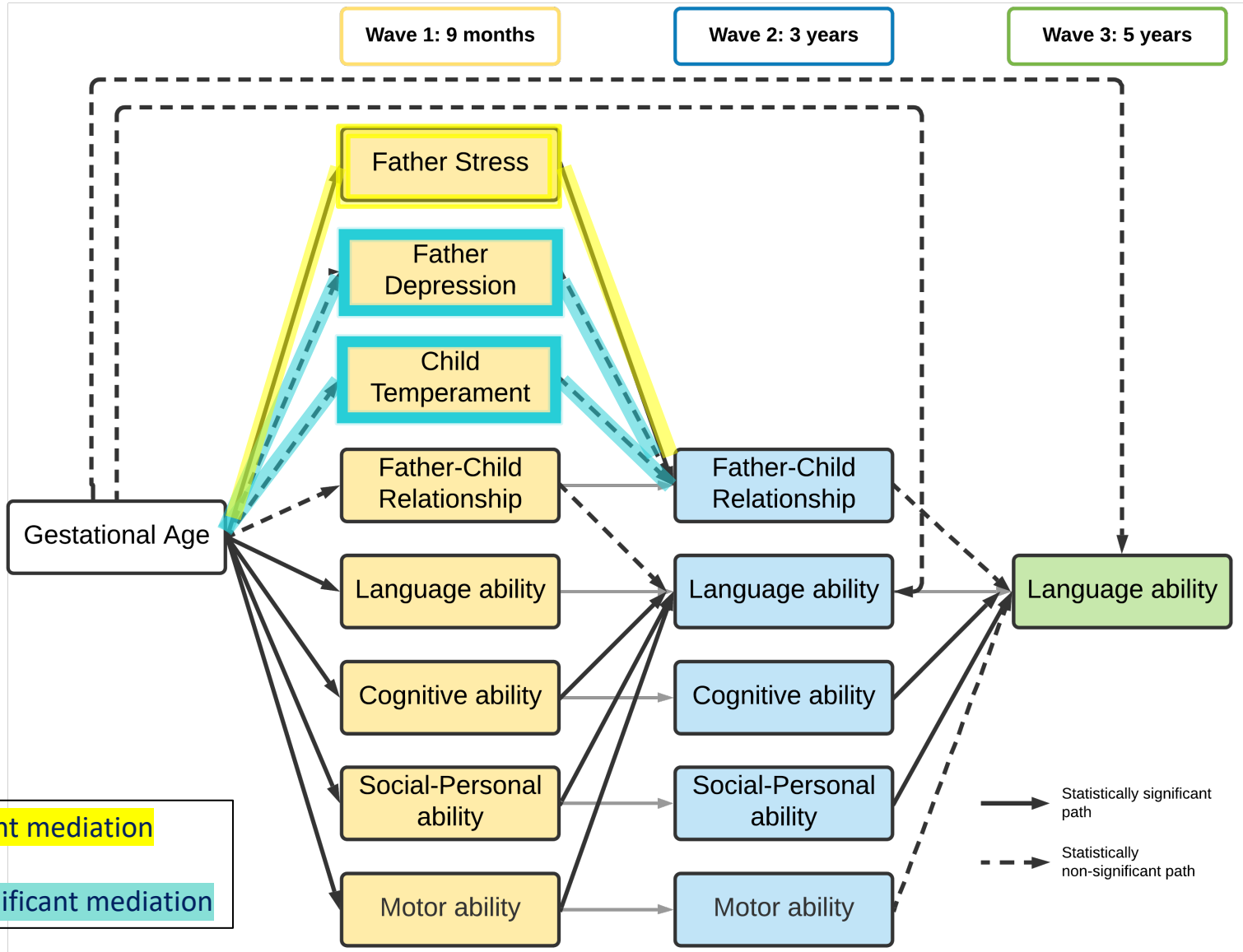

Key Findings

No direct effect of gestational age on expressive language outcomes at 3 or 5 years of age.

The effect of gestational age on 3-year-old language outcomes is fully mediated by cognitive, motor, and social-personal abilities at 9 months of age. No mediation by mother-child/father-child relationship quality at 9 months.

Mother-Father difference: Parental stress (at 9 months) significantly mediates the association between gestational age and parent-child relationship quality (at 3 years) among fathers, but not among mothers.

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POLICY IMPLICATIONS

Implications (1)

Irish hospitals conduct developmental assessments of preterm infants at 2 years of age

- GUI data show that preterm-born children exhibit poorer expressive language abilities at 3 years of age.
- Since there is low stability in developmental scores across infancy/toddlerhood (Kalstabakken et al., 2021), difficulties not detected at 2 years of age may emerge later on.

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- GUI data show that preterm-born children exhibit poorer expressive language abilities at 3 years of age.
- Since there is low stability in developmental scores across infancy/toddlerhood (Kalstabakken et al., 2021), difficulties not detected at 2 years of age may emerge later on.
- Potential need for **repeated** screening/assessment of preterm-born children during the preschool years (Kalstabakken et al., 2021).

Implications (2)

Non-linguistic difficulties predict later language difficulties

- In the context of routine screening/assessments, non-linguistic developmental difficulties could signal the emergence of later language difficulties.

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- In the context of routine screening/assessments, non-linguistic developmental difficulties could signal the emergence of later language difficulties.
- Any preventative or intervention measures targeted at improving language outcomes should embody a holistic view of the development of the preterm-born child.

Implications (3)

Mothers and Fathers navigate the caregiving challenges associated with preterm-birth differently.

- In existing literature, fathers are often omitted or lumped alongside Mothers as ‘parents’.
- The current findings illustrate how separate processes characterise mothers’ and fathers’ experiences of caring for a preterm child, and the need for discrete research on each group.

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- In existing literature, fathers are often omitted or lumped alongside Mothers as 'parents'.
- The current findings illustrate how separate processes characterise mothers' and fathers' experiences of caring for a preterm child, and the need for discrete research on each group.

More efforts needed in Irish health policy to support fathers of preterm infants.

- Fathers treated as 'secondary' to mothers in their relevance as caregivers (Hennessy et al., 2020).
- Irish hospitals should proactively involve both parents in the care of preterm-born children through adopting 'family-centred care' (Baldoni et al., 2021) and through policy changes that facilitate the involvement of fathers (e.g., paternity leave extensions following preterm birth).

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FUTURE RESEARCH

Infant & Child Research Lab (TCD)

PETIT project

*(**Pre**term Infan**t** **I**nteraction and Developmen**t**)*

Building on these findings, the lab is investigating the parent-child relationships and developmental outcomes (incl. language) of preterm-born children in Ireland.

Fieldwork currently underway in collaboration with Coombe Women & Infants University Hospital and the wider community!

Also preparing a journal article aimed toward medical practitioners to provide guidance on the use of developmental assessment/screening tools with preterm-born children.

Thank you for your attention!

Acknowledgements

Dr Jean Quigley, Dr Elizabeth Nixon, Prof. Eleanor Molloy.

Team at Infant & Child Research Lab (TCD, School of Psychology).

Coombe Women and Infants University Hospital.

Families from the wider community and advocacy groups.

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