

Development of an Index of Well-being in Middle Childhood in Ireland



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Indicators



- **Widely used statistical markers that denote a particular phenomenon, e.g. infant mortality rate**
- **More common in economics and finance**
- **Social indicators bridge gap between empirical measurement and theory**
- **Can examine condition of individuals across time**

Measuring Child Well-Being in Ireland



- **State of the Nation's Children biennial reports**
 - Aim to describe and monitor holistic well-being of children since 2006
- **National Set of Child Well-Being Indicators**
 - >50 population indicators
 - Socio-demographics, children's relationships, education, health, social, emotional and behavioural outcomes, formal and informal supports
- **Composite index of child well-being (macro-level)**
 - Bradshaw & Richardson (2009)
 - Children's material situation, housing and environment, health, subjective well-being, education, children's relationships, risk and safety

Micro-level Indices



- **Micro-level indices**
 - Child as unit of measurement
 - Understand children at present time
 - Developmental pathways relating to functioning at individual level
 - Give children a voice
 - Child-centered perspective to concept of well-being
 - Links between well-being and ecological processes and context
 - Limited efforts to create micro-level indices of child well-being

Other studies



Name	“Child Well-Being Index”	“Child Well-Being Index”	“Outcome Index”
Authors	Moore & Lippman, 2005	Moore et al., 2008	Sanson et al., 2010
N	>30,000	102,353	5,107 and 4,983
Study	National Survey of America’s Families	National Survey of Children’s Health	Longitudinal Study of Australian Children
Age	6-11 & 12-17 years	6-11 & 12-17 years	3-19 mo. & 4-5 years
No. Indicators	17	69	6 and 16
Domains	Health & Safety Education Social & Emotional Development	Physical Psychological Social Educational	Health & Physical Development Social & Emotional Functioning Learning Competency

Current Study – Index of Child Well-Being in Ireland



- **Irish National Longitudinal Study of Children – “Growing up in Ireland” (GUI)**
 - Infant cohort – 9 months, 3 years and 5 years, >11,000 children
 - Child cohort – 9 years and 13 years, > 8,500 children
- **Sample used:**
 - Child cohort Wave 1
 - 8,568 children, primary caregivers (PCGs) and teachers
 - 98% 9-year-olds, 94% biological mothers
- **No prescribed protocol to create micro-level indices**
- **Mirror calculation method of Outcome Indices by Sanson et al., 2010**
 - Similar to GUI
 - Comparable measures
 - No application of cut-points

Creation of the Index of Well-being



- **Choosing variables for inclusion**
 - ✦ Measure actual well-being
 - ✦ Represent well-*being* not just well-*becoming*
 - ✦ Positive and negative indicators

- **Assessing suitability of variables**
 - ✦ Missingness
 - ✦ Psychometric properties of the multi-item measures
 - ✦ Relationships between variables in each domain assessed for 1) redundancy and 2) overly high correlations

Health Status
Long Term Illness or Disability
BMI



Social &
Emotional
Functioning

Internalising
SDQ Emotional Symptoms

Externalising
SDQ Conduct Problems
SDQ Hyperactivity

Social Competence
SDQ Prosocial Behaviour
SDQ Peer Problems

Cognitive
Ability

Literacy
Drumcondra Vocabulary Score
Reading Ability
Literacy Skills

Numeracy
Drumcondra Maths Score
Maths Performance PCG
Maths Performance Teacher

Calculating the Index of Well-being: Step 1



- **Step 1 - All 14 component variables standardised to z scores**
- **Age trends**
 - Health status
 - Long term illness or disability
 - SDQ Prosocial Behaviour
 - Literacy skills
- **Test level**
 - Drumcondra Primary Reading Vocabulary Test-Revised
 - Drumcondra Primary Mathematics Test-Revised
- **BMI**
 - Adjusted for gender, age and weight status

Calculating the Index of Well-being: Steps 2 - 4



- **Step 2 - Creating subdomain scores**
 - Standardised mean score of component indicators
- **Step 3 - Creating domain scores**
 - Standardised mean score of component subdomains
 - Standardised with mean(M)=100 and standard deviation (SD)=10
- **Step 4 - Creating index of well-being scores**
 - Standardised mean of Physical Health, Social & Emotional Functioning, and Cognitive Ability domain scores**
 - Standardised with M=100 and SD=10

** *N= 8238 as only calculated in cases where all 3 scores were available*

Structure of the Index - Indicator Level



- **Components of each domain**
 - Significantly correlated in expected direction
 - Social & Emotional Functioning and Cognitive Ability stronger correlations than Physical Health
 - Coefficients of relationship between BMI and two other health indicators = .06

Structure of the Index – Domain Level



- Between domain correlations

	Physical Health	Social & Emotional Functioning
Physical Health	-	-
Social & Emotional Functioning	.18***	-
Cognitive Ability	.11***	.38***

N ranged from 8238 to 8568

***p<.001

Principal Components Analysis



- Forced 1-factor Principal Components Analysis

Component Matrix

	Component
	1
Index of Well-Being - Social & Emotional Functioning Domain	.806
Index of Well-Being - Cognitive Ability Domain	.761
Index of Well-Being - Physical Health Domain	.490

Total Variance Explained

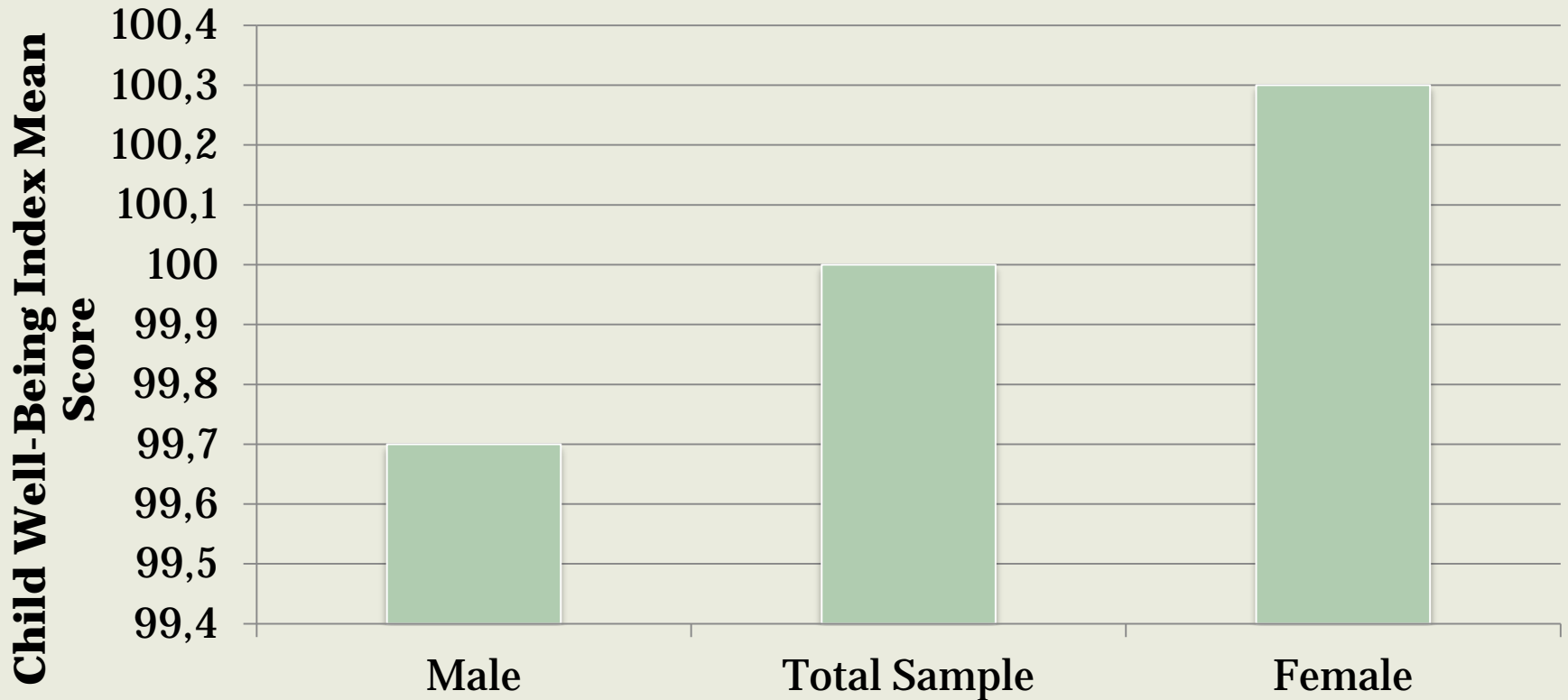
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.469	48.957	48.957	1.469	48.957	48.957
2	.918	30.611	79.569			
3	.613	20.431	100.000			

Extraction Method: Principal Component Analysis.

Illustrative uses of the Index – Demographics 1



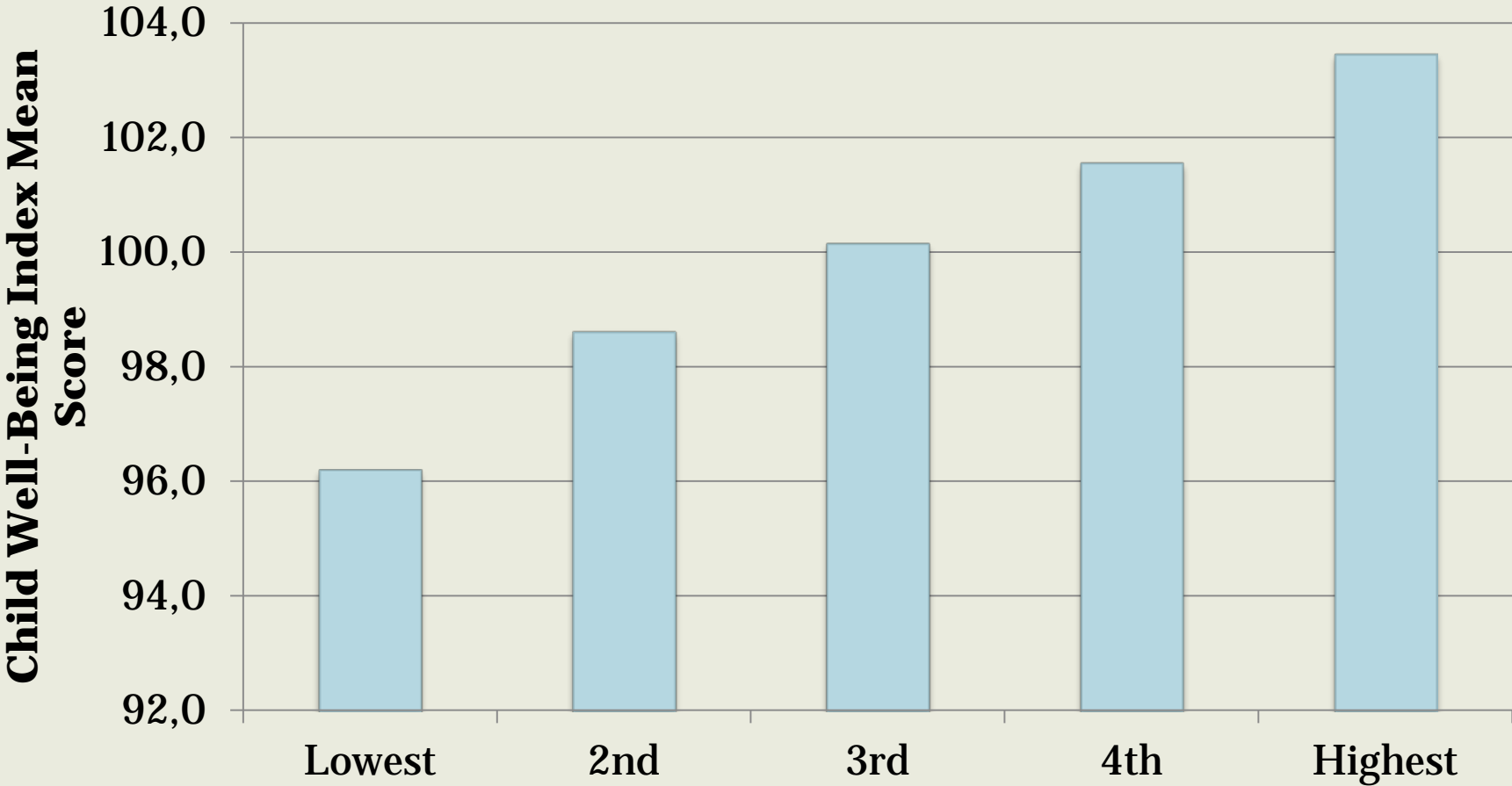
Mean Score on Child Well-Being Index by Gender



Illustrative uses of the Index – Demographics 2



Mean Score on Child Well-Being Index by Income Quintile



Illustrative uses of the Index – Categorical 1



- Top and bottom 15% in the Index

Overrepresented Demographic Groups

Lowest Scoring 15%	Highest Scoring 15%
Boys	Girls
Single parent families	Two parent families
Low income households	High income households
Low educated PCGs	Highly educated PCGs
Unemployed PCGs	Employed PCGs

Illustrative uses of the Index – Categorical 2



TOP 15%

0.8% in all 3 domains (n=68)

36.4% in at least 1 domain (n=3003)



BOTTOM 15%

1.4% in all 3 domains (n=116)

34.4% in at least 1 domain (n=2830)

Conclusion



- **Limitations**

- 15th percentiles arbitrary cut-points
- interpretation of indices must be understood within context of influences
- children are not unidimensional

- **Summary**

- portrays complex, multidimensional concept in parsimonious, understandable way
- can act as marker and predictor
- simplicity of a single figure
- a statistic that is easily understood by all stakeholders

Early Child Development Monitoring - Canada



MARIE CURIE INTERNATIONAL EXCHANGE PROGRAMME

Early Child Development Monitoring



- **Forum for Early Child Development Monitoring**
 - Population level monitoring system
 - 18 month - practical
- **Étude longitudinale du développement des enfants du Québec (ELDEQ)**
 - Data collection point at 17/18 months
 - Physical, social/emotional and cognitive outcomes up to age 13
- **Aims:**
 - What items at 18 months predict future outcomes?
 - In general what is the predictive power of developmental information at 18 months?

Process - examining developmental milestones



5 months

- Motor skills (4 items)
- Social/emotional development (4 items)
- 8 singular items

18 months

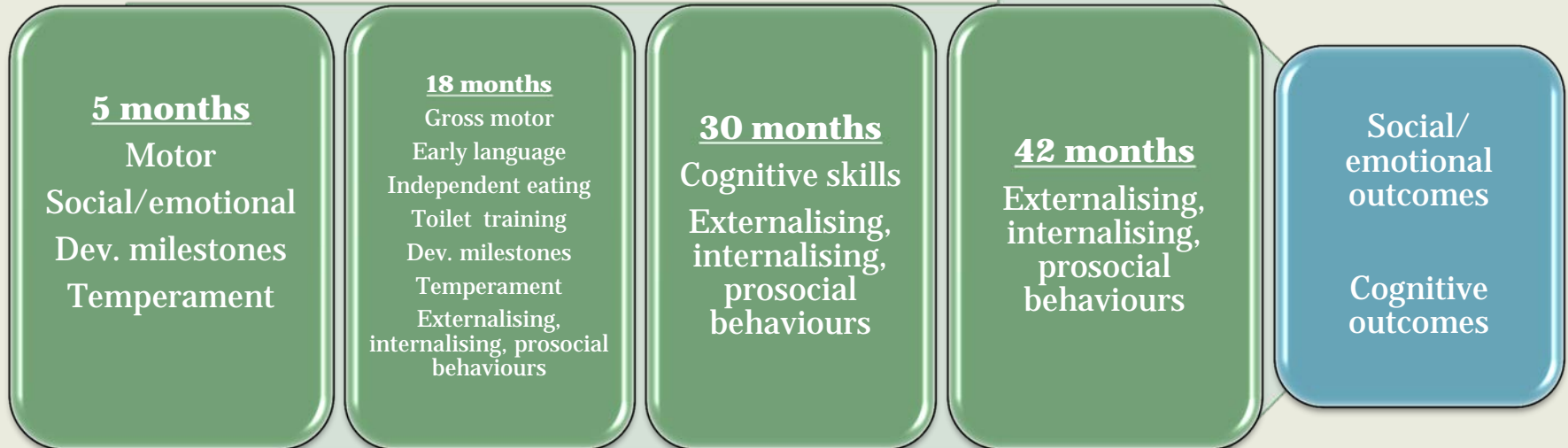
- Early language (3 items)
- Gross motor skills (3 items)
- Independent eating (3 items)
- Toilet training (4 items)
- 12 singular items

30 months

- Cognitive skills (3 items)

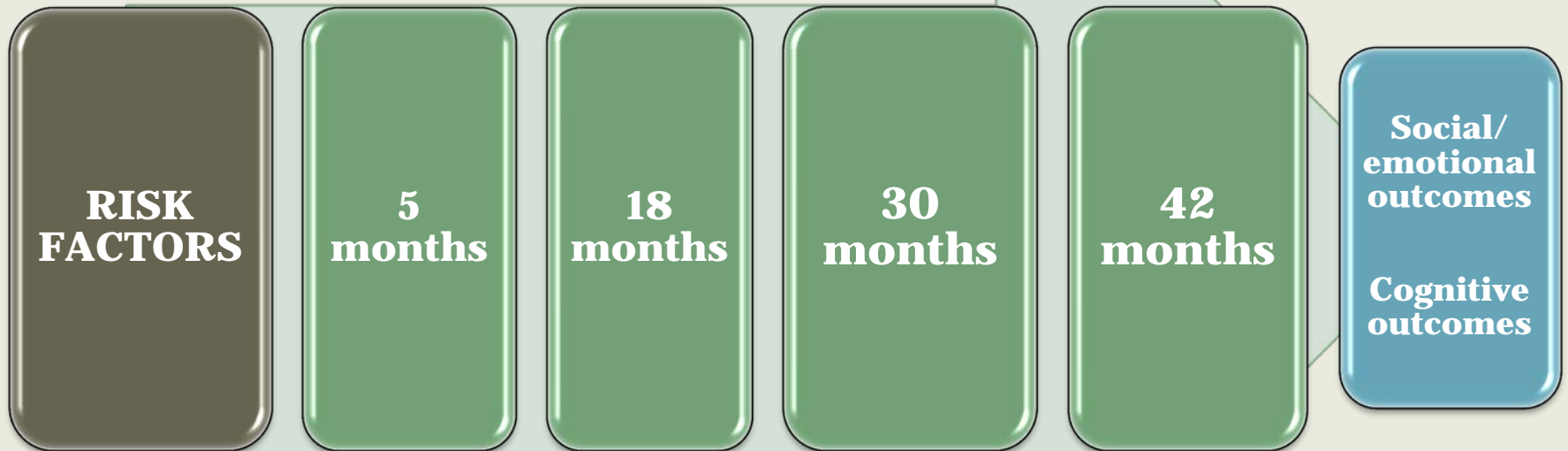
Process – items from 5, 18, 30 and 42 months

- Sequential regressions



Process – inclusion of risk factors

- Sequential regressions



Preliminary findings



- **Externalising behaviour in kindergarten**
 - 10.3% variance explained by 18 month items
- **Internalising behaviour in kindergarten**
 - 9%
- **Literacy across ages 7/8 (K-ABC)**
 - 8.9%
- **Numeracy across ages 8/11 (CAT/2)**
 - 5.3%
- **Similar for boys and girls**
- **Risk factors did not hugely diminish variance explained**

Thank you!



*Any further comments or queries:
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