School Readiness and Achievement in Middle Childhood

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Outline

- Background and Motivation
- Research Questions
- Data and Measures
- Results
- Implications and Conclusions
- Caveats Future Directions

What is School Readiness?

Academic research:

- “[T]he elements of early intervention programs that enhance social and emotional development are just as important as the components that enhance linguistic and cognitive competence”

(Shonkoff and Phillips, 2000: 398-99)

What is School Readiness?

US kindergarten teachers:

- being physically healthy, rested, and well-nourished
- being able to communicate needs, wants, and thoughts verbally
- being enthusiastic and curious in approaching new activities
- knowing how to sit still and pay attention

- Only 10% thought that it was important that children starting school know the alphabet.

Prior Literature

- School entry academic skills are more important for later achievement than socioemotional skills
  - Six longitudinal datasets from three countries (Duncan et al, 2007)
  - School entry math skills are the most important predictor
  - School entry attention-related measures appear to matter somewhat, but not as strong as early academic skills
- Early attention skills important for later achievement gains, but not vice versa (Claessens & Dowsett, 2009)
  - Two US longitudinal datasets

Research Questions

For Australian children:

- To what extent do school-entry academic, attention and socioemotional skills relate to later achievement?
- What is the likely impact on eventual school achievement of randomly-assigned academic, attention and behavioral skills interventions in the year prior to school entry?
  - In other words, what skills should preschool programs target?

Data

- Nationally representative sample of Australian children: LSAC Age 4/5 cohort
  - Three waves of data
    - Ages 4/5, 6/7, and 7/8
- Data from children, parents, and teachers

Outcomes of Interest

Achievement measured at age 8/9

- Test scores: Adapted Peabody Picture Vocabulary Test (PPVT-III)
  - Knowledge of spoken words
  - Receptive vocabulary
- Teacher reports: Academic Rating Scale (ARS)
  - Literacy
  - Numeracy

School Readiness Measures

Age 4/5 School Readiness Skills

- Academic skills: PPVT-III
- Cognitive ability: Who Am I? (WAI)
  - Copying, writing
  - General cognitive ability
- Socioemotional skills and attention
  - Parent reports: Strengths and Difficulties Questionnaire (SDQ)
    - Emotional symptoms
    - Conduct problems
    - Peer relationship problems
    - Hyperactivity/inattention

Background Characteristics

- Child characteristics
  - Age, health, sex, birth weight, first born, Indigenous
- Maternal characteristics
  - Work, health, mental health, education, immigrant status, age
- Family/home characteristics
  - Two parent family, NESB, household size, income, financial hardship, non-parental care use, number of children's books in the home, how often parents: read, tell stories, draw, etc

Basic Model

$$ACH_{i8/9} = a_1 + ß_1\ ACADEMIC_{i4/5} + ß_2\ WAI_{i4/5} + ß_3\ SDQ_{i4/5} + ß_4\ CHILD_{i4/5} + ß_4\ Fam_{i4/5} + e_{it}$$

- Age 8/9 test scores and teacher rated achievement predicted by age 4/5 school readiness measures

- Also, examine subgroups at risk for school failure

Sample Characteristics

Measured at Age 4/5	Mean	SD
Child age (in weeks)	249.9	11.4
Female	.47	.50
NESB	.14	.34
Indigenous	.03	.18
Two parent family	.86	.35
Maternal education less than 12 years	.47	.50
Mother employed	.55	.50

n=3574, weighted means and standard deviations

Outcomes and School Readiness Measures

Age 8/9	**Mean**	**SD**
PPVT	77.97	4.9
Teacher Reports		
Literacy	3.62	.98
Math	3.58	.99
Age 4/5		
PPVT	63.98	6.23
Who am I? (WAI)	63.92	8.18
Parent Reports		
Prosocial behavior	7.75	1.77
Emotional symptoms	1.74	1.69
Conduct problems	2.52	2.00
Peer relationship problems	1.69	1.56
Hyperactivity/inattention	3.52	2.25

Age 8/9 Outcomes using Age 4/5 Test Scores and Parent Reports

	Test Score	Teacher Report	
Age 4/5	**PPVT**	**Literacy**	**Math**
PPVT	0.31**	0.20**	0.17**
WAI	0.17**	0.35**	0.37**
Parent Report			
Prosocial behavior	-0.01	-0.02	-0.03
Emotional symptoms	-0.03	0.00	0.00
Conduct problems	-0.01	-0.01	-0.03
Peer relationship problems	0.03	-0.01	-0.01
Hyperactivity/inattention	-0.01	-0.11**	-0.10**
Control Variables	X	X	X

**p<.01; n~3200; clustered for post code, weighted and unweighted results the same

Bias from using parent reports?

- Use the sub-sample of children with teacher reports of achievement and SDQ at age 4/5

Age 8/9 Outcomes using Age 4/5 Teacher Reports

	Test Score	Teacher Report	
Age 4/5	**PPVT**	**Literacy**	**Math**
WAI	0.19**	0.33**	0.34**
Teacher Report			
Literacy	0.03	0.04	0.06*
Math	0.09**	0.12**	0.12**
Prosocial behavior	-0.02	-0.01	-0.03
Emotional symptoms	-0.03	-0.03	-0.03
Conduct problems	0.05	0.03	0.03
Peer relationship problems	0.01	0.00	0.01
Hyperactivity/inattention	-0.09**	-0.16**	-0.15**
Control Variables	X	X	X

**p<.01; *p<.05; n~2200; clustered for post code, weighted and unweighted results the same

Socioemotional skills might be more predictive of shorter-run achievement

- Examine age 6/7 achievement outcomes

Age 6/7 Outcomes using Age 4/5 Test Scores and Parent Reports

	Test Score	Teacher Report	
Age 4/5	**PPVT**	**Literacy**	**Math**
PPVT	0.37**	0.16**	0.14**
WAI	0.11**	0.37**	0.38**
Parent Report			
Prosocial behavior	0.00	-0.00	-0.01
Emotional symptoms	-0.02	-0.01	-0.00
Conduct problems	-0.01	-0.02	-0.02
Peer relationship problems	0.02	0.00	-0.02
Hyperactivity/inattention	-0.01	-0.06**	-0.06**
Control Variables	X	X	X

**p<.01; n~3200; clustered for post code, weighted and unweighted results the same

Do these skills matter more for certain groups of children?

- Boys and girls
- Low SES
- Income support reliant
- Jobless households
- Single parent families
- Indigenous families
- NESB
- Immigrant children (or children of immigrants)

Age 8/9 Outcomes using Age 4/5 Test Scores and Parent Reports for Boys and Girls

	Test Score		Teacher Report			
Age 4/5	**PPVT**		**Literacy**		**Math**	
	Girls	Boys	Girls	Boys	Girls	Boys
PPVT	0.29**	0.35**	0.19**	0.20**	0.17**	0.16**
WAI	0.19**	0.15**	0.34**	0.36**	0.38**	0.36**
Parent Report						
Prosocial behavior	-0.02	-0.01	-0.02	-0.03	-0.03	-0.04
Emotional symptoms	-0.04	-0.01	0.01	-0.02	0.03	-0.01
Conduct problems	-0.02	-0.01	0.00	-0.06	-0.02	-0.04
Peer relationship problems	-0.02	0.07**	-0.01	-0.01	-0.01	-0.01
Hyperactivity/inattention	-0.02	0.00	-0.12**	-0.11**	-0.12**	-0.09**
Control Variables	X	X	X	X	X	X

**p<.01; clustered for post code, weighted and unweighted results the same

Do these skills matter more for certain groups of children?

- No evidence of difference for all subgroups examined
- Boys and girls
- Low SES
- Income support reliant
- Jobless households
- Single parent families
- Indigenous families
- NESB
- Immigrant children (or children of immigrants)

Summary

- Age 4/5 cognitive skills, academic skills and hyperactivity/inattention are important predictors of achievement in middle childhood
  - Hyperactivity/inattention more predictive for teacher rated outcomes than test scores
  - Suggestive evidence that early math skills might be more important than early reading skills, but no math test in the data only teacher reports
- No differences across subgroups of children

Implications

- Evidence suggests that preschool and school readiness programs should target academic skills and attention skills in order to boost later achievement
- Consistent with prior literature showing importance of school entry academics and attention for later achievement-related measures

Caveats and Future Directions

- Non-experimental analysis
- Limited achievement measures in middle childhood
- Only explored the SDQ (parent and teacher)

- Examine non-achievement outcomes
  - Approaches to learning, retention in grade
- Examine children with very low levels of school entry skills
- Understand why hyperactivity/inattention is more important for teacher rated outcomes than test scores

Age 8/9 Outcomes using Age 4/5 Parent Reports

	Test Score	Teacher Report	
Age 4/5	**PPVT**	**Literacy**	**Math**
WAI	0.23**	0.39**	0.40**
Parent Report			
Literacy	0.03	0.04*	0.03
Prosocial behavior	-0.02	-0.03	-0.03
Emotional symptoms	-0.04*	-0.01	0.00
Conduct problems	-0.01	-0.01	-0.02
Peer relationship problems	0.02	-0.02	-0.02
Hyperactivity/inattention	-0.03	-0.12**	-0.11**
Control Variables	X	X	X

**p<.01; *p<.05; n~3200; clustered for post code, weighted and unweighted results the same

Age 6/7 Outcomes using Age 4/5 Teacher Reports

	Test Score	Teacher Report	
Age 4/5	**PPVT**	**Literacy**	**Math**
WAI	0.10**	0.33**	0.33**
Teacher Report			
Literacy	0.09**	0.05*	0.06*
Math	0.08**	0.12**	0.10**
Prosocial behavior	0.04	0.01	0.00
Emotional symptoms	-0.02	-0.04**	-0.04
Conduct problems	0.05	0.04	0.02
Peer relationship problems	0.07*	0.01	0.00
Hyperactivity/inattention	-0.06*	-0.15**	-0.14**
Control Variables	X	X	X

**p<.01; *p<.05; n~2200; clustered for post code, weighted and unweighted results the same