

How do principals decide who sits standardised tests and implications for school accountability?

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Introduction

- Many countries, including the United States and United Kingdom, have universal standardised testing
- Universal testing is contentious for children with disability
 - On the one hand, it ensures that schools are held accountable for the learning of ‘all’
 - On the other,
 - it can create anxiety and reinforce negative messages of incapacity, which can be harmful
 - incentivises subtle discriminatory, or ‘gatekeeping’ behaviour to exclude children with disability
- The Australian model of testing (NAPLAN) represents a compromise
 - Universal testing, but principals can exempt students with ‘significant disability’
- For the model to work, principals have to exercise these powers with discretion

Introduction

- Research questions:
 - Do principals exercise their power of exemption with discretion?
 - What are the implications for the exercise of this power on school accountability?
- Contribution to the literature
 - Headland study on how principals exercise powers of disability exemption
 - Coelli and Foster (2016) found that there is a reduction in participation of low-achieving students after launch of *MySchool*
 - Figlio and Getzler (2002) examined reclassification of students in response to the introduction of high-stakes testing in the US under *No Child Left Behind*

Program for Students with Disability (PSD)

- In Victoria, individually targeted payments are available to meet the extra cost of providing for individual special needs, known as the Program of Support for Disability (PSD)
- Seven categories: ADHD, hearing, vision, intellectual, physical, severe behavioural problems & severe language difficulties
- Eligibility is based on medical assessment of diagnostic criteria prior to commencing school
 - E.g. a criterion for funding under intellectual disability is an IQ of 70 or below
 - Assessment isn't automatic, based on agreement between principal and parents prior to school
 - Not everyone who may be eligible is assessed - difficult process that can be stigmatising
- 6 levels of funding, based on assessed need: \$6095 p.a. (level 1) - \$46,519 p.a. (level 6)

Data

- Base sample is population of students commencing mainstream public schools in Victoria in 2012 from the Australian Early Childhood Development Census (AEDC)
 - Triennial teacher responses to >100 questions on each child's development in prep (May-July)
 - Answers combined to produce indices in 5 domains: physical, emotional, social, language and cognition and communication and general knowledge
 - Includes teacher assessments of disability, based on an observed condition that limits student's ability to do school work in a regular classroom
- For children starting public schools in Victoria in 2012 we link:
 - Year 3 NAPLAN data (from 2015 and 2016), including test scores and participation status
 - PSD receipt data from Prep-Year 3, including funding type and funding levels

Sample

AEDC 2012 disability status	Sample for analysis		Omitted from the sample				
			Targeted PSD recipients				
	AEDC disability, PSD funding prep-year 3	AEDC disability, No funding	Level 5-6 funded	Lost funding in 2015	Gained funding in 2015	No disability 2012	Total
No disability	0	0	0	6	165	35,822	35,993
Physical	14	111	2	3	3	0	133
Visual	4	679	0	0	8	0	691
Hearing	13	156	0	0	5	0	174
Speech	7	2,210	0	4	60	0	2,281
Emotional/behavioural	40	1,062	0	3	81	0	1,186
Learning impairment	75	181	0	10	30	0	296
Multiple impairment							
With learning impairment	383	446	10	34	137	0	1,010
Without learning impairment	57	502	0	7	52	0	618
Total	593	5,347	12	67	541	35,822	42,382

Key descriptive statistics

	Has a disability, PSD continuous funding prep-year 3	Has a disability, no PSD receipt
Outcomes in Year 3 NAPLAN		
Sat year 3 NAPLAN reading test	34%	89%
Attained at least national minimum standards (270)	32%	83%
Did not attain national minimum standards	2%	6%
AEDC Prep student capabilities and impairments		
AEDC language and cognition national index		
Vulnerable (0-10th percentile)	46%	16%
At risk (11-25th percentile)	24%	22%
On track (26-50th percentile)	18%	27%
On track (50-100th percentile)	12%	35%
Count	593	5347

Key descriptive statistics

	Has a disability, PSD continuous funding prep-year 3	Has a disability, no PSD receipt
<i>Student socio-economic background</i>		
<i>Mother's highest education qualification (NAPLAN)</i>		
Less than Year 12	27%	24%
Year 12	12%	13%
VET qualification	24%	28%
Diploma/Advanced Diploma	13%	12%
Degree or higher qualification	24%	23%
<i>AEDC non-English speaking background</i>	20%	13%
<i>AEDC Aboriginal or Torres Strait Islander (ATSI)</i>	4%	3%
<i>AEDC female</i>	26%	35%
<i>AEDC indicator for lives in Melbourne</i>	69%	67%
Count	593	5347

Modelling approach

- Estimate indiscriminate principal exemption:

$$\text{Prob}(\text{SatNAPLAN}_i = 1) = \beta X_i + \delta_1 \text{PSD}_i + \theta \text{AEDC}_i + \mu \text{Disab}_i + e_i$$

- δ_1 is a measure of indiscriminate exemption – effect of the ‘flag for disability’, independent of observed student capabilities
- Estimate of per-student impact of exemption on school average and rank:

$$\text{Rank}(\overline{\text{NAPLAN}_j}) - \text{Rank}(\overline{\text{NAPLAN}_{j'}}) = \beta N_{ej} + e_{ij}$$

$$\text{Rank} [\sum_i \text{NAPLAN}_{ij} / N_j] - \text{Rank} [\sum_i \text{NAPLAN}_{ij} + \widehat{\text{NAPLAN}}_{ej} / (N_j + N_{ej})]$$

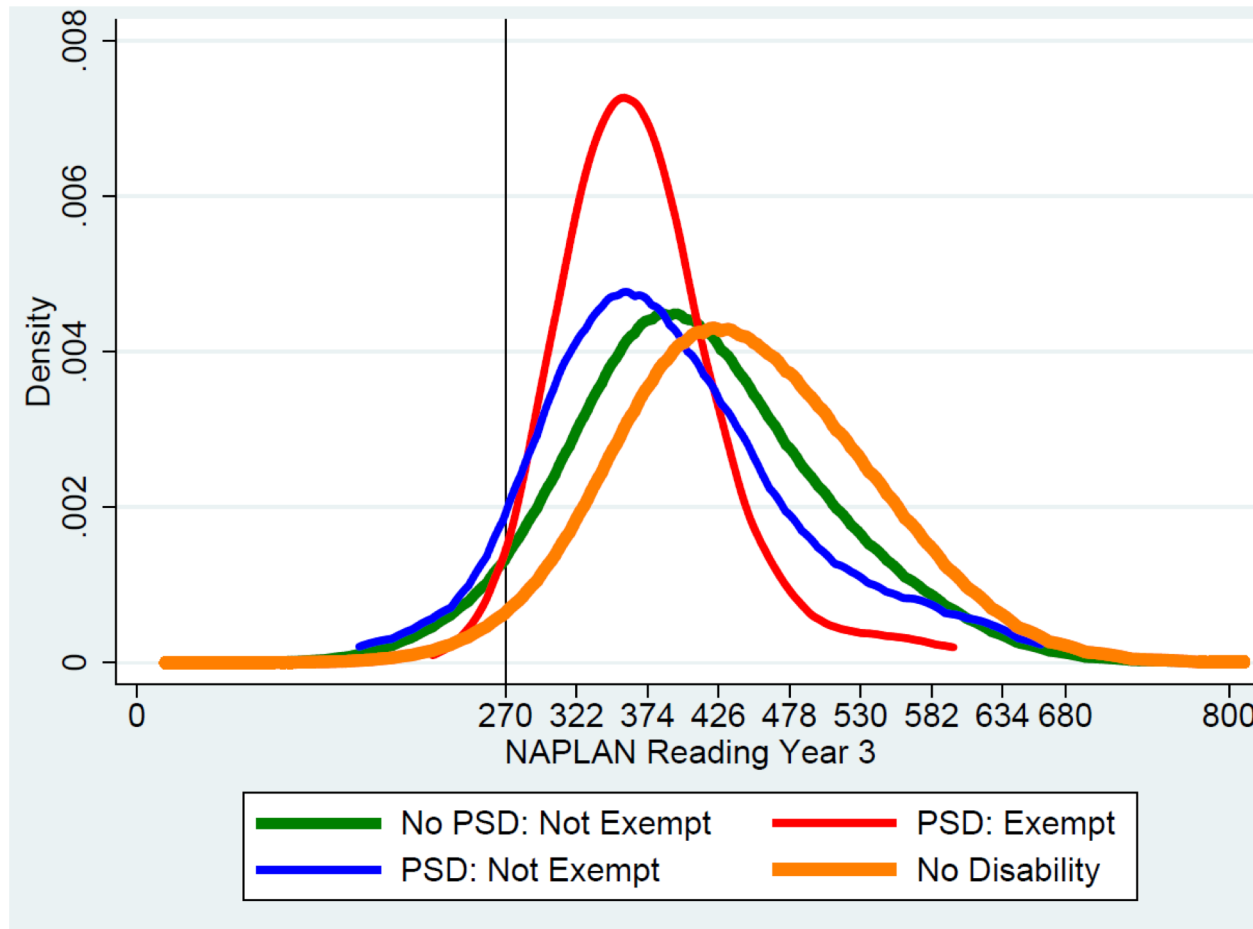
$$(\widehat{\text{NAPLAN}}_i | \text{SatNAPLAN}_i = 1) = \beta X_{ej} + \widehat{\delta}_2 \text{PSD}_{ej} + \widehat{\theta} \text{AEDC}_{ej} + \widehat{\mu} \text{Disab}_{ej} + e_{ij}$$

$$(\text{NAPLAN}_i | \text{SatNAPLAN}_i = 1) = \beta X_i + \delta_2 \text{PSD}_i + \theta \text{AEDC}_i + \mu \text{Disab}_i + e_i$$

Probit marginal effects of NAPLAN participation

Alternative samples	Marginal effects	Standard errors
<i>Standard - exclude PSD changes</i>		
PSD receipt prep-year 3	-0.280***	(0.029)
<i>Include those with PSD changes</i>		
PSD receipt prep-year 3	-0.331***	(0.027)
Gained funding prep-year 3	-0.402***	(0.097)
Lost funding prep-year 3	-0.166***	(0.053)
<i>Restrict to less severe conditions</i>		
Level 1-2 prep-year 3	-0.254***	(0.034)
<i>By condition</i>		
Autism spectrum disorder	-0.254***	(0.037)
Hearing	-0.093*	(0.053)
Intellectual disability	-0.364***	(0.041)
Physical disability	-0.275***	(0.093)
Severe behavioural disorder	-0.256***	(0.071)
Severe language disorder	-0.182	(0.117)
Visual impairment	-0.503**	(0.236)

Predicted & actual Year 3 NAPLAN results



Per-student impacts on school mean score & rank

Quintile rank of school-average year 3 NAPLAN reading participant scores	School NAPLAN reading measure	Marginal effect per PSD exemption	s.e.
Lowest quintile (N=335)	Rank	3.35***	(0.404)
	Score (mean 423)	0.526***	(0.063)
Second quintile (N=193)	Rank	12.026***	(0.936)
	Score (mean 434)	1.165***	(0.082)
Third quintile (N=214)	Rank	11.728***	(1.176)
	Score (mean 441)	1.252***	(0.105)
Fourth quintile (N=206)	Rank	14.131***	(1.063)
	Score (mean 450)	1.438***	(0.090)
Highest quintile (N=192)	Rank	7.665***	(1.232)
	Score (mean 459)	1.527***	(0.147)
Total (N=1140)	Rank	8.166***	(0.408)
	Score (mean 440)	0.979***	(0.041)

Schools in the lowest quintile are missing 0-5 funded students from NAPLAN; the rest are missing between 0 and 3 funded students.

Conclusions

- Given discretion, principals heavily exclude students with disability from testing based on the flag of individually-targeted funding
 - With incomplete information on student capacities, principals are being cautious
 - Principals are reducing impacts of disability enrolment on school accountability measures
- Implications for school accountability
 - Overall, minor impacts on measures of school accountability
 - Non-participants are below average, but based on observables, are capable of sitting NAPLAN
 - Too few funded students to have real impacts on school average measures
 - Limited information to hold schools accountable for special education and the effective use of targeted disability funding

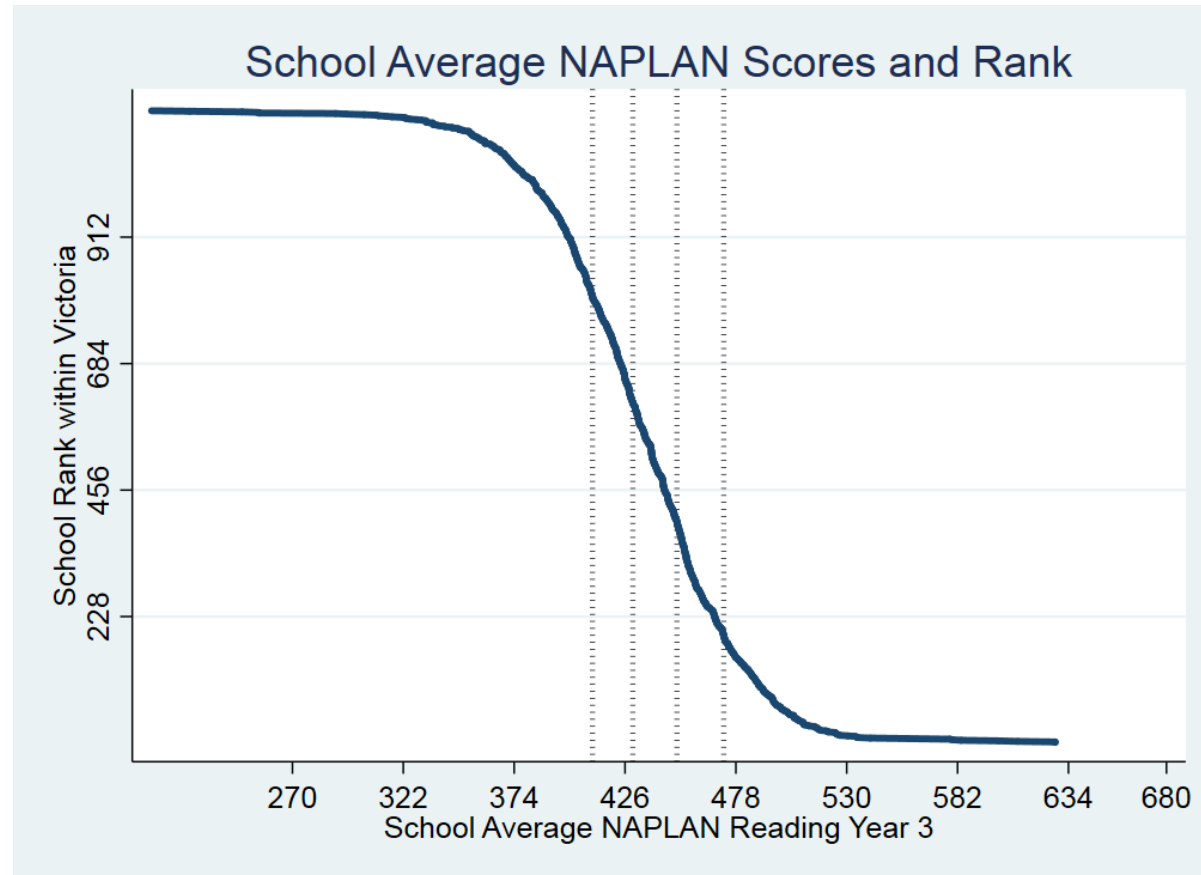
Conclusions

- We suggest a ‘responsive regulatory’ approach to reform:
 1. Define ‘significant disability’ for principal exemption
 - Only to prevent anxiety where there is a reasonable chance that it could harm the student
 2. Remove PSD recipients from the calculation of school-average scores for *MySchool*
 - Removes any accountability cost of enrolling students with disability
 - Incentivises schools to initiate PSD assessments
 3. Require the use of alternative agreed ‘condition appropriate’ assessment tools
 - Imposes a cost on exemption and incentivises principals to evaluate the appropriateness of NAPLAN

School exemption rates by NAPLAN year 3 rank

Quintile rank of school-average year 3 NAPLAN participant scores	Participation rate	Maximum no.
Lowest quintile	54%	5
Second quintile	32%	3
Third quintile	33%	3
Fourth quintile	33%	3
Highest quintile	18%	2
Total (N=1140)	34%	5

NAPLAN year 3 rank by school-average score



Probit model of attaining national min. stds.

	Heckman selection			Univariate
	Marginal effects	Coefficient	Marginal effects	Marginal effects
PSD receipt prep-year 3	0.418*	-1.176***	0.035***	0.022
	(0.217)	(0.088)	(0.013)	(0.014)
Leave-out own, school mean disability exemption rate (1)	--	-0.523***	--	--
		(0.055)		
Leave-out own, school mean disability withdrawn rate (2)	--	-0.486***	--	--
		(0.045)		
(1) x (2)	--	0.244***	--	--
		(0.038)		
School mean non-disability withdrawn rate (3)	--	(0.118)	--	--
		(0.077)		
(2) x (3)	--	0.174***	--	--
		(0.058)		
Constant	1.585***	1.178***		--
	(0.201)	(0.128)		
Rho	-0.283	[0.11]		

Probit marginal effects of NAPLAN participation

	With and without extra AEDC controls for student capabilities			
	Language and cognitive (standard)		Language and cognitive, social & emotional	
PSD receipt prep-year 3	-0.280***	(0.029)	-0.274***	(0.029)
Language and cognitive skills				
At risk (11-25pc)	0.124***	(0.016)	0.109***	(0.016)
On track (26-50pc)	0.176***	(0.016)	0.153***	(0.018)
On track (51-100pc)	0.234***	(0.017)	0.204***	(0.019)
Emotional development				
At risk (11-25pc)	-		0.028**	(0.014)
On track (26-50pc)	-		0.035**	(0.016)
On track (51-100pc)	-		0.042***	(0.018)
Social development				
At risk (11-25pc)	-		0.008	(0.013)
On track (26-50pc)	-		0.002	(0.017)
On track (51-100pc)	-		0.027	(0.020)

Descriptive statistics

	Has a disability, PSD continuous funding prep-year 3	Has a disability, no PSD receipt
<i>School characteristics</i>		
<i>AEDC share of school prep peer cohort with disability</i>		
0-25%	74%	70%
26-50%	24%	28%
51-75%	2%	1%
More than 75%	1%	0%
<i>AEDC share of school prep peer cohort with disability who receive PSD</i>		
0-25%	58%	92%
26-50%	35%	7%
51-75%	2%	0%
More than 75%	6%	0%
Count	593	5347