Who receives Government Benefits?: the Effect of Reading/Writing Assistance on Take-Up of Disability Support Pension

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14-16 July 2019, ACE2019

Motivation

Disability Support Pension (DSP) is an important income support for Australians with permanent disability

- However, 56.7% of DSP claims rejected in 2012-2013
- The most common non-medical rejection reason for DSP: 'Failed to supply requested information' (12% in 2012-13)
- Assistance with application increases enrolment (Bettinger et al., QJE, 2012)

Research Question

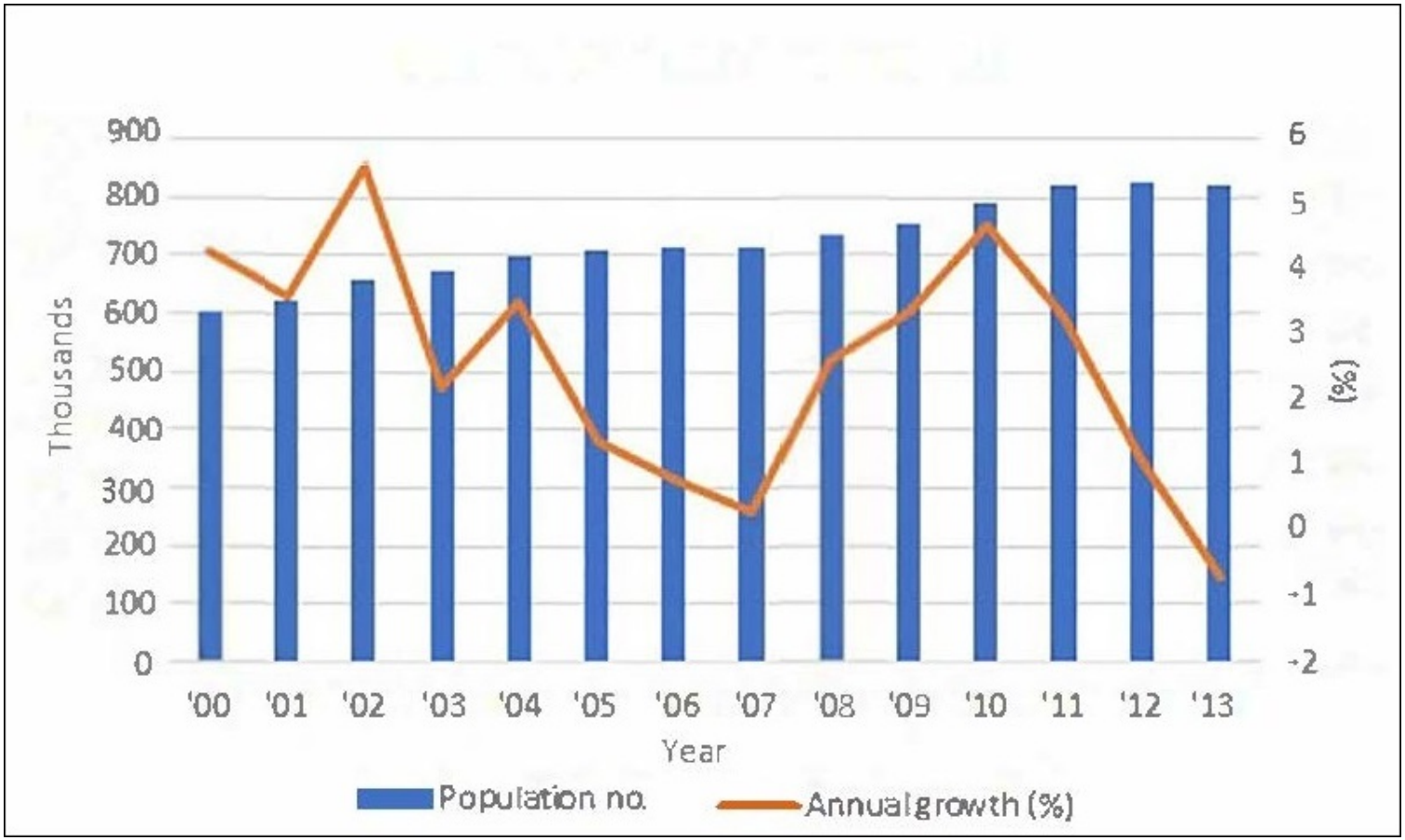
Does reading/writing assistance (RWassis) affect the probability of receiving Disability Support Pension (DSP)?

Disability Support Pension

- Income support for people unable to work due to a permanent physical, intellectual or psychiatric impairment
- Eligibility Criteria (means tested)
  - $\geq$16 and under age pension age
  - reside in Australia for 10yrs.
  - permanently blind; or
  - impairment assessed at $\geq$20points; and
  - inability to work $\geq$15hrs./week for the next 2yrs.; and
  - inability to undertake training activity
- Second largest participation rate (821,738 recipients as at June 2013) after Age Pension

Disability Support Pension

Figure: DSP Population & Annual Growth



Data source: Characteristics of Disability Support Pension Recipients June 2013, Department of Social Services, Australian Government

Data

- **Australian Bureau of Statistics (ABS)**
  Survey of Disability, Ageing and Carers (SDAC)
  2003, 2009 & 2015 (pooled cross-sections)
  - Basic Confidentialised Unit Record File (CURF)

    - Individuals with disability aged 16-64 (18,141: 9% of total sample)
      - Individuals with (24%) and without (76%) DSP
      - Individuals with (8%) and without (92%) RWassis

▸ Appendix I: Variable Construction

Empirical Issue

Endogeneity of reading/writing assistance: selection bias

- Using recursive bivariate probit to account for potential endogeneity in health econ. literature
  - Genetic IVs for impact of diabetes on employment (Shelton Brown III et al., Health Economics, 2005)
  - Role of disability benefits in employment (Frutos and Castello, The European Journal of Health Economics, 2015)
  - Effect of prenatal care on maternal health (Liu et al., Health Policy, 2015)

Empirical Methods

Recursive Bivariate Probit Model

$$Y^* = X'\alpha + D'\beta + e_i, \quad Y = \mathbb{1}(Y^* > 0); \tag{1}$$
$$D^* = X'\gamma + Z'\pi + u_i, \quad Y = \mathbb{1}(D^* > 0), \tag{2}$$

where $\mathbb{1}(\cdot)$ is an indicator function.

Y^*: DSP
D^*: RWassis
X: age, age squared, male, married, immigrants, arrival year in Aus., children aged < 15, state, major city, household size, year
Z: Age at Onset

Empirical Methods

Recursive Bivariate Probit with an IV

$$DSP_i^* = \beta RWassis_i + X_i'\alpha + e_i \quad (3)$$

$$RWassis_i^* = \pi Onset_i + X_i'\gamma + u_i \quad (4)$$

$$\left\{ \begin{array}{l} DSP_i = 1 \text{ if } DSP_i^* > 0 \\ DSP_i = 0 \text{ if } DSP_i^* \leq 0 \end{array} \right\}$$

$$\left\{ \begin{array}{l} RWassis_i = 1 \text{ if } RWassis_i^* > 0 \\ RWassis_i = 0 \text{ if } RWassis_i^* \leq 0 \end{array} \right\}$$

If $\rho(e, u) \neq 0$, univariate probit produces inconsistent parameters

Age at Onset as possible IV

Instrumental Variable

Age at Onset as an IV

- Validity: $Cov(Onset, e) = 0$
- Relevance: $Cov(Onset, RWassis) \neq 0$

Probit vs. Recursive Bivariate Probit

	Probit	Probit	RBP: DSP	RBP: RWassis
RWassis	1.05***	1.12***	2.11***	
Age		0.06***	0.07***	-0.002
Male		0.14***	0.12***	0.14***
Married		-0.65***	-0.60***	-0.14***
Immig. (non-Eng.)		0.39***	0.37***	0.10
Arrival in Aus.		-0.10***	-0.10***	-0.02
Household size		-0.02	-0.03***	0.09***
Age at Onset				-0.01***
Constant	-0.82***	-2.14***	-2.30***	-0.98***
ATE $[Pr(DSP = 1)]$	0.386***	0.375***		0.655***
ρ				-0.55***
N	18,141	16,546	16,356	16,356

Controls also include age square, immigrants (Eng.), children aged < 15, state, major city and year dummies

Probit vs. Recursive Bivariate Probit: Disability Type

	Probit	RBP: DSP	RBP: RWassis
RWassis	1.04***	1.40***	
Cancer/Tumour	0.07	0.07	0.17
Endocrine & Immune System	-0.02	-0.02	0.08
Psychological/Psychiatric	0.16***	0.14**	0.34***
Intellectual/Learning	0.25***	0.13	1.04***
Nervous System	-0.03	-0.05	0.29***
Sense Organs	-0.65***	-0.63***	-0.04
Circulatory System	0.02	0.02	0.30***
Respiratory System	-0.09	-0.08	-0.26**
Musculo-Skeletal	-0.13**	-0.12**	-0.24***
Congenital Anomalies	0.33***	0.24**	0.83***
Injury	-0.42***	-0.41***	-0.06
ATE $[Pr(DSP = 1)]$	0.339***		0.459***
ρ			-0.19*
N	16,546	16,356	16,356

Omitted condition type is ''Others''. Other covariates are the same as before

Average Treatment Effect

	Average Prob.	Probit	RBP
Socio-economic covariates		Yes	Yes
Disability type covariates		Yes	Yes
$Pr(DSP = 1)$	0.257	0.337	0.459
N	16,356	16,356	16,356

Sensitivity: Age at Onset as dummy

	RBP: DSP	RBP: RWassis	RBP: DSP	RBP: RWassis
RWassis	1.62***		1.04***	
Age	0.07***	0.03***	0.07***	0.02***
Male	0.16***	0.11***	0.17***	0.12***
Married	-0.60***	-0.08**	-0.62***	-0.09**
Immig. (non-Eng.)	0.37***	0.11	0.38***	0.11*
Arrival in Aus.	-0.10***	-0.02	-0.10***	-0.02
Household size	-0.03**	0.07***	-0.02	0.08***
Onset $<= 3$ (dummy)		0.55***		
Onset $<= 18$ (dummy)				0.18***
Constant	-2.34***	-2.15***	-2.34***	-2.12***
ATE $[Pr(DSP = 1)]$		0.525***		0.339***
ρ		-0.31***		-0.004
N	16,356	16,356	16,356	16,356

Controls also include age square, immigrants (Eng.), children aged < 15, state, major city, year dummies and disability type dummies

Robustness Check

- **Different Sub-samples:** ▸ Appendix II: Sub-samples
- **Altonji et al. (JPE, 2005):** effectiveness of Catholic schools w/ estimation based on the relationship btw. selection on observables and unobservables ▸ Appendix III: Alternate correlation of disturbances
- **Oster (2013): Stata module PSACALC**
  Treatment Effects (β) and Relative Degree of Selection (δ)

β	δ	*Rmax*
0.51	1	1
0	5.73	1

  - Treatment effect of *RWassis* (β) is 0.51 if selection on unobservables is assumed to be equal to selection on observables
  - Unobservables need to be 6 times as important as the observables to produce $\beta = 0$

Conclusion

Reading/writing assistance increases probability of DSP receipts even after selection into it has been taken into account

- Policy implication: providing formal RWassis to help increasing access to DSP for target groups
- Implication for other government benefits where burden of eligibility proof is higher for recipients

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Appendix I: Variable Construction

Survey questions used for variable construction

[Do/Does] [name] have difficulty with reading and writing tasks such as checking bills or bank statements, writing letters or filling in forms?

[Do/Does] [you/he/she] receive assistance from any organised services, to help with reading and writing tasks?

[Do/Does] [you/he/she] receive assistance from anyone else, such as a [partner or spouse/parent], family, friends or neighbours to help with reading and writing tasks?

Appendix II: Different Sub-samples

Group	N	Ave. prob.	ATE	ρ
Psychological/Psychiatric	2,054	0.350	0.603***	-0.74***
Intellectual/Learning	971	0.380	0.506***	-0.63***
Employment Restriction	11,064	0.354	0.492***	-0.39***
Permanently unable to work	4,374	0.673	0.400***	-0.88***

Controls are the same as the table for Probit vs. Recursive Bivariate Probit. Disability type covariates included for work restriction sub-samples

Group	N	Ave. prob.	ATE	ρ
Intellectual/Learning	971	0.380	0.450***	-0.70***

Controls include severity

Appendix III: RBP Estimates based on Different Correlation of Disturbances

Sensitivity Analysis following Altonji et al. (2005)

Various assumptions about ρ
(correlation between error components of DSP and RWassis|X's & RWassis)

ρ	-1.0	-0.8	-0.6	-0.4	-0.2	0	0.2	0.4	0.6	0.8	1.0
β	nd	2.51	2.19	1.86	1.50	1.12	0.72	0.30	-0.14	-0.61	nd

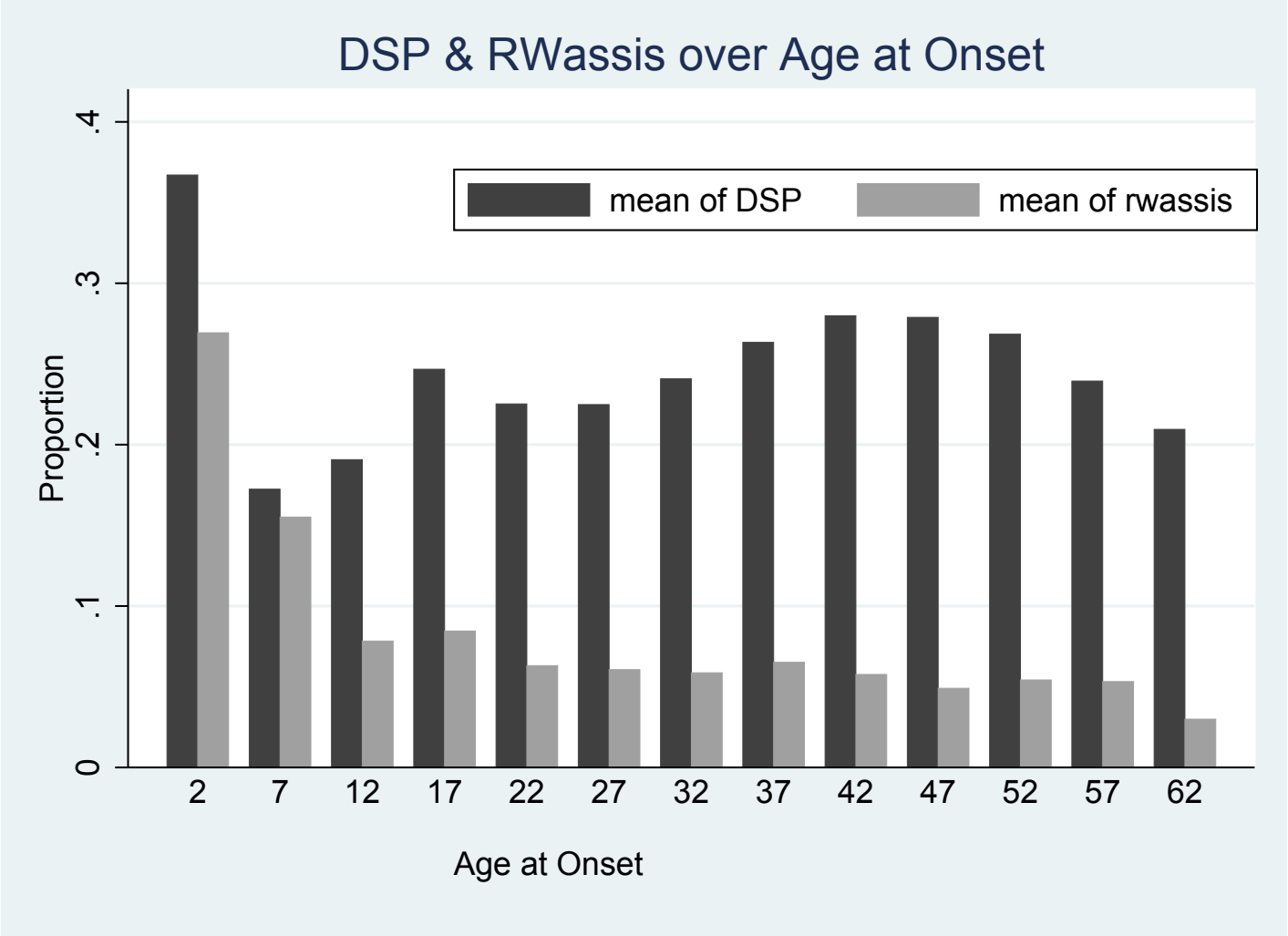
*nd: not defined

- ρ has to be more than 0.5 for the effect to be either zero or negative

Comparison with 2SLS (Alternative to straight 2SLS)

Covariates	Average	LPM No	LPM Yes	2SLS(LPM) Yes	2SLS(Probit) Yes
$Pr(DSP = 1)$	0.238	0.386	0.376	0.452	0.360
N	18,141	18,141	16,546	16,356	16,356

Distribution of DSP & RWassis over Age at Onset



Data source: ABS SDAC 2003, 2009, 2015