Does Poverty Influence Cognitive Development and Mobility?

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- Gap in the research on the effects of poverty in early childhood in the Irish context
- International research suggests that general cognitive ability in childhood is socially stratified from a very young age (Duncan, Yeung, Brooks-Gunn and Smith 1998; Sullivan, Ketende and Joshi 2013; Byrne and O'Toole 2015; McGinnity, Murray and Russell 2020).
- This matters because of the impact of cognitive ability on outcomes later in life
  - Educational attainment
  - Occupational attainment
  - Health and well-being
- Has relevance for social policy and our sociological understanding of the reproduction of inequality over the life course

- What are the characteristics of children at the lower end of the cognitive development distribution at age 3 and at age 5?
  - Are children living in income poverty more likely to be found at the lower end of the development distribution?

- What are the characteristics of children that experience cognitive mobility: those who enters and exits the lower end of the distribution?
  - Are children living in income poverty more likely to get trapped in the 'sticky floor' of low cognitive development?
  - Is there a causal effect of poverty on cognitive development?

Data

- Infant Cohort of GUI
  - Wave 1: 9 months (n=9,001)
  - Wave 2: 3 years (n=8,712)
  - Wave 3: 5 years (n=9,001)
- Babies born in December 2007 to June 2008

Dependent Variables

- Age appropriate standard cognitive tests at Age 3 and at Age 5
  - Naming Vocabulary & Picture Similarities

- Used as measures of cognitive development, not measures of innate intelligence.
  - "tests of attainment based on the capability and motivation to complete a particular task under given conditions" (Platt et al., 2014, p. 52)
- Used principal component factor analysis to derive latent cognitive ability scores based on correlations between the observed standardised test scores at ages 3 and 5.
  - Cognitive development scale age 3, converted to deciles
  - Cognitive development scale age 5, converted to deciles

- Combined to reduce the detection of spurious changes in observed test scores over time, see also Bruckauf and Chzhen 2016; Jerrim and Vignoles 2013.

Independent Variables

Child Related Variables

- Child related
  - Child gender
  - Number of siblings
  - Low Birth weight
  - Breast fed (at least 6 months)
  - First Born
  - Problem solving score at 12 months
  - Gross motor skill score at 12 months
  - Fine motor skill score at 12 months
  - Total communication score at 12 months
  - Total personal social score at 12 months

Family Related Variables

Poverty Status at each wave

Poverty Dynamics w1-w3

Family Related Variables

- Cultural and Socio-economic background
  - Second generation family
  - Family social class
  - PCG Education Level
  - Household employment situation
  - Family structure
  - Language used in the home
  - PCG Age
  - Owner occupied housing

- Childcare Age 3
- Child Related Variables

- Parental Involvement
  - Frequency of reading to the child at age 3
  - Time spent watching TV age 3

Analytic Strategy

1. Probit regression models of the probability of being in the three lowest deciles of cognitive development at Age 3 and at Age 5
   - Results presented as average marginal effects

2. Analysis of change in cognitive development scores between Age 3 and Age 5
   - Descriptive analysis of cognitive change
   - Cognitive mobility probabilities – what explains entry into and exit of low cognitive development between ages 3 and 5?

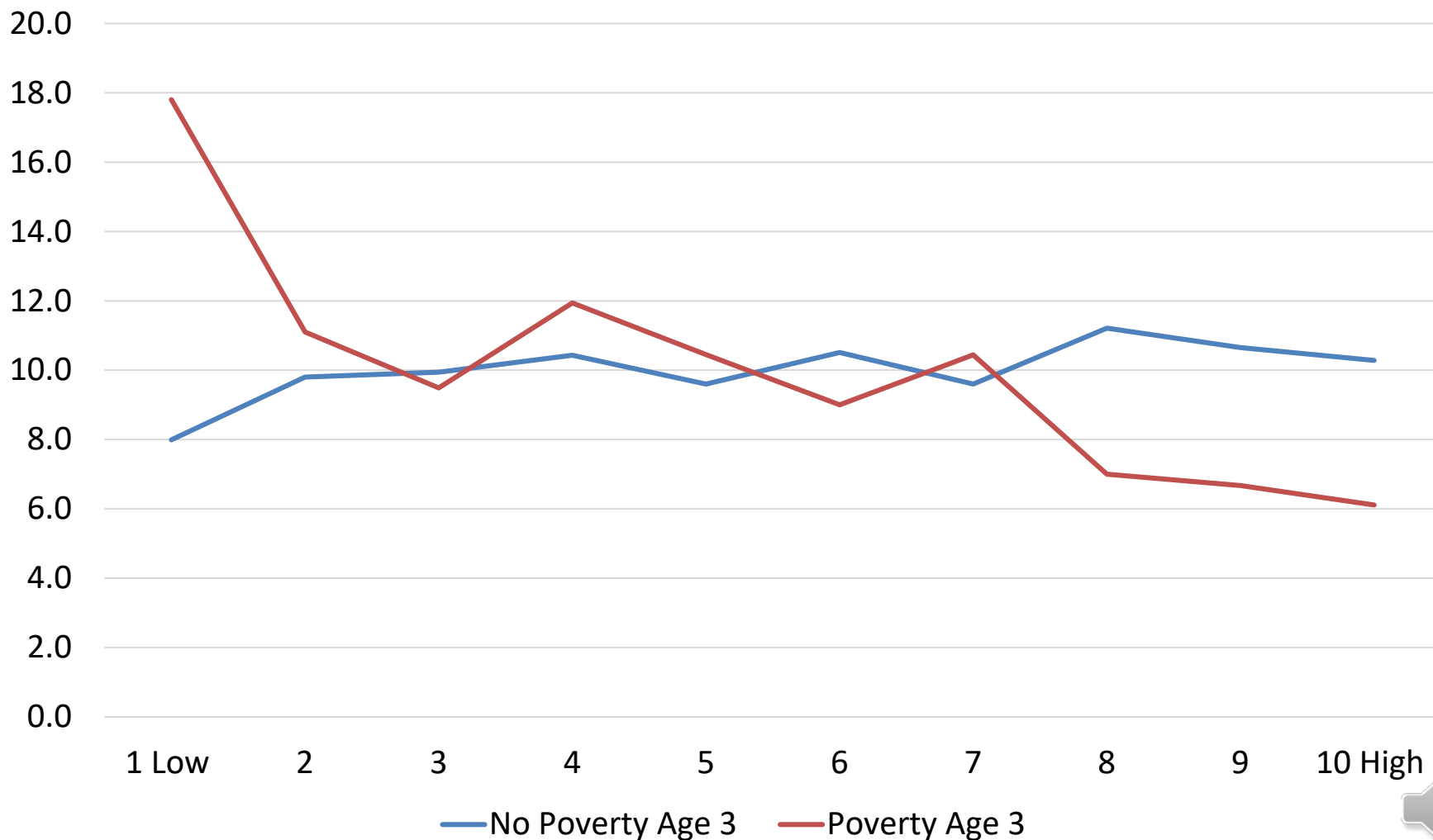Figure 1: Deciles of Cognitive Development by Poverty Status, Age 3

Figure 2: Deciles of Cognitive Development By Poverty Status, Age 5

Table 1: Results of Probit Regression Predicting Low Cognitive Development

	Age 3		Age 5	
	AME	se	AME	se
Middle Incomes	0.025^	0.014	0.026*	0.013
Income Poverty	0.038*	0.018	0.044**	0.017
Household Income Unknown	0.047^	0.026	0.007**	0.026
Ref: High Incomes				

- Children that experience income poverty are statistically more likely to be located in the low cognitive development group at ages 3 and 5, all else being equal.
- Model at Age 3 also controls for child related characteristics, and home cultural and socio-economic characteristics (measured at age 3)
- Model at Age 5 also controls for child related characteristics, and home cultural and socio-economic characteristics (most measured at age 5)

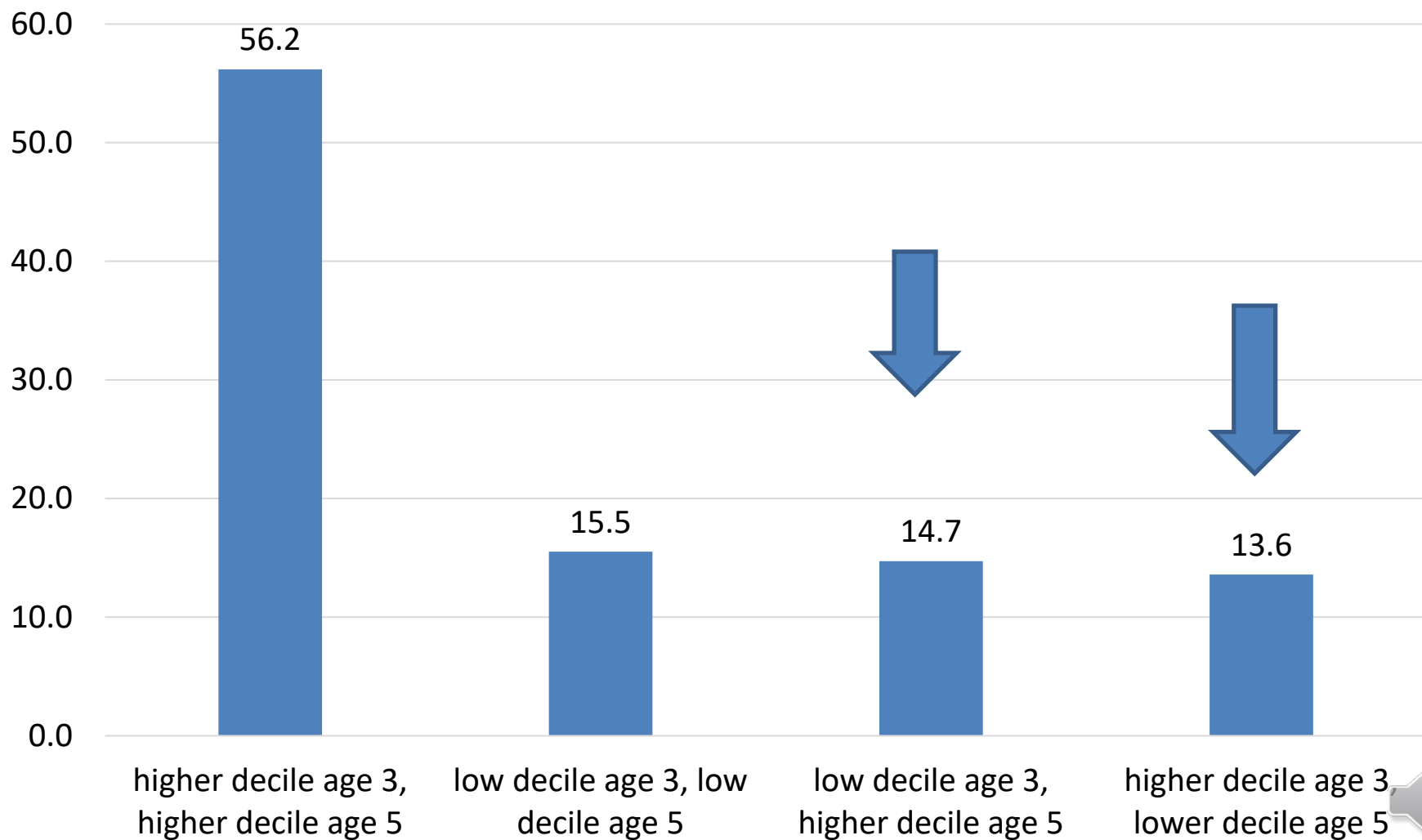Figure 3: Distribution of Change in Cognitive Scores Between Ages 3 and 5

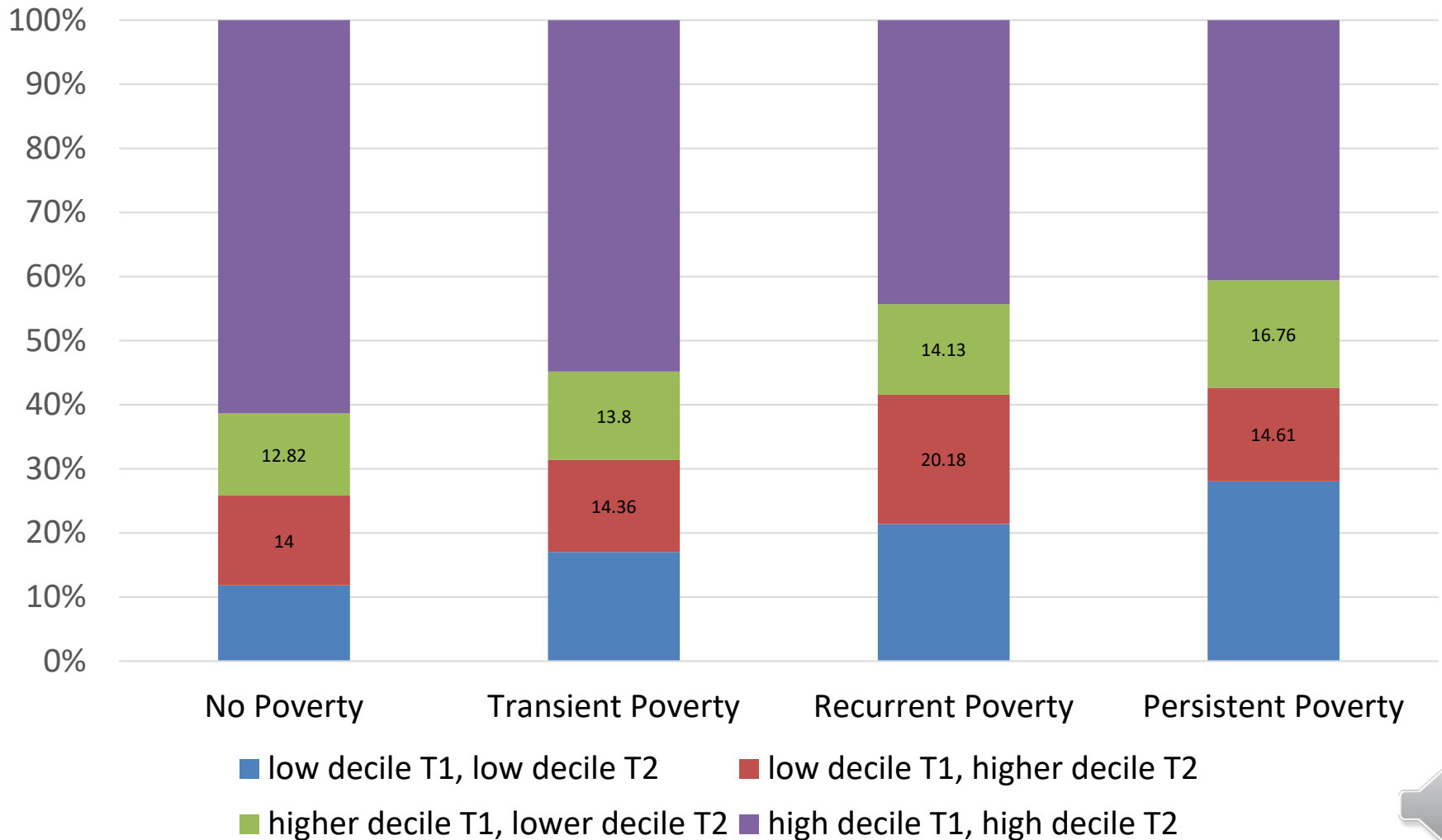Figure 4: Distribution of Cognitive Change by Household Poverty Status

Figure 5: Share of children by poverty status that exit and enter the low cognitive group (conditional on change)
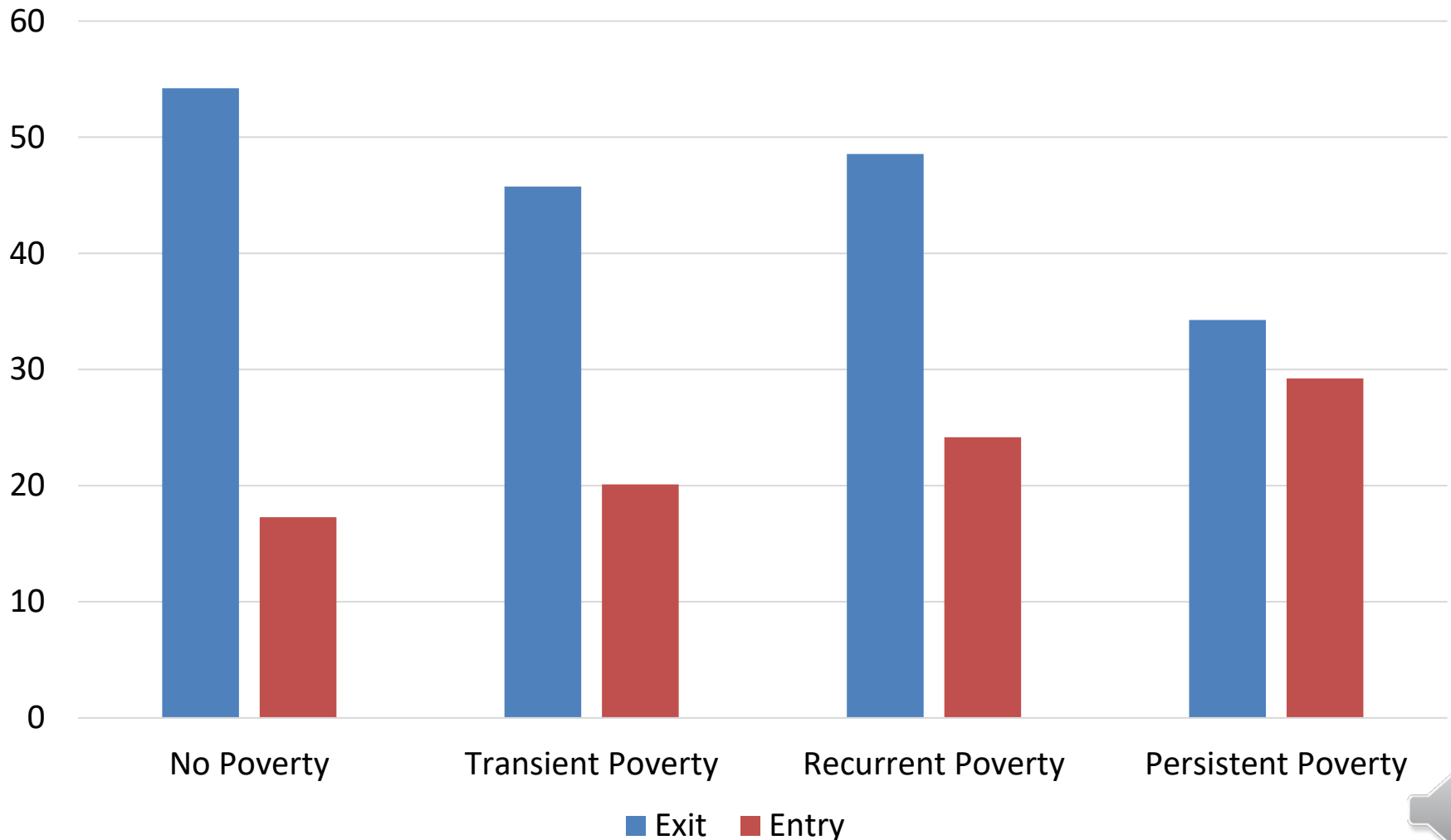
Table 2: Results of Probit Regression Predicting Exit and Entry into Low Cognitive Development Group

	Exit Model		Entry Model	
	AME	se	AME	se
Middle Incomes	-0.031	0.031	0.004	0.016
Income Poverty	0.054	0.036	0.027	0.021
Household Income Unknown	-0.051	0.043	0.028	0.025
Ref: High Incomes				

- No income poverty effect.
- Same result when fixed effects models applied to the data
  - In both models the poverty effect disappears when socio-economic characteristics entered

- Exit and Entry models also include controls for child related characteristics, and home cultural and socio-economic characteristics (measured at age 3)

- **What are the characteristics of children at the lower end of the cognitive development distribution at age 3 and at age 5?**
  - At both age 3 and age 5, children living in income poverty more likely to be found at the lower end of the cognitive development distribution
  - Income poverty differences widen between ages 3 and 5.

- **What are the characteristics of children that experience cognitive mobility: those who enter and exit the lower end of the distribution?**
  - *Are children living in income poverty more likely to get trapped in the 'sticky floor' of low cognitive development?*
  - 15.5% of all children get trapped in the 'sticky floor' of low cognitive development.
  - The descriptive analysis shows that children who experience poverty have higher levels of entry into low cognitive development
  - However, the models show that children living in poverty are no more likely to enter or exit low cognitive development than children who are not living in poverty, all else being equal.
  - Suggests that there is not a causal effect of poverty on cognitive

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