

# Literacy and Fertility

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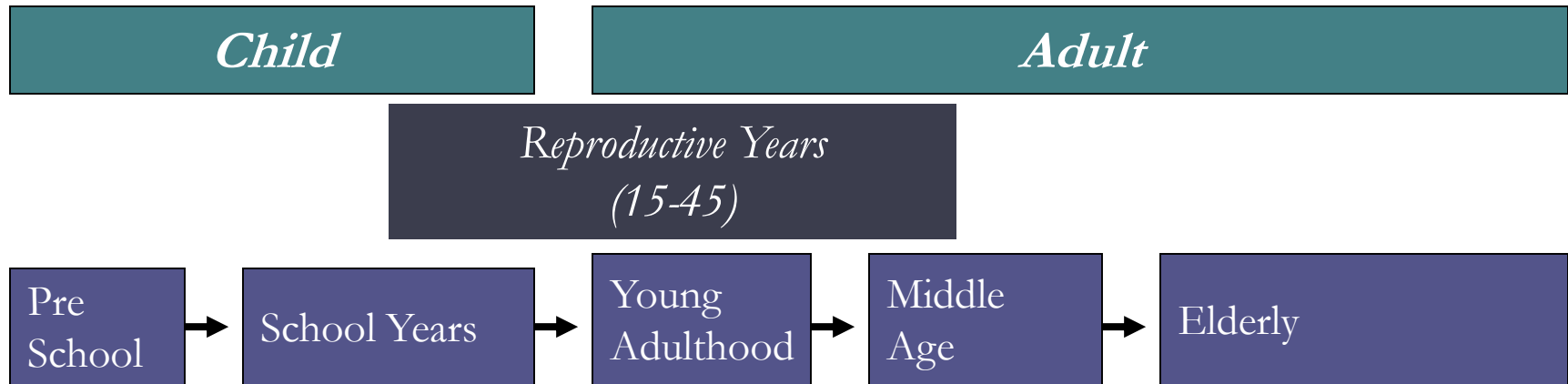
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December 11<sup>th</sup>, 2016

# Social factors influence health

- Types of social factors
  - Socio-economic status (income, education)
  - Demographics (race/ethnicity)
  - Literacy
- Mechanisms or markers?
  - Lifecourse perspective
  - Distinctions important to interventions and policy

# Literacy and health through the lifecycle



# Childbearing and public health

- Major impacts on health of individuals and broader society
  - Single largest source of hospitalization in US adults <50
- Predictors for increased childbearing
  - Low educational attainment
  - Low socioeconomic status
  - Racial/ethnic minority status

# Literacy and public health

- Low literacy associated with poor health outcomes
  - Associated with, but distinct from educational attainment
- Risk factors for low literacy
  - Low education attainment
  - Non native speaker in home nation
  - Racial/ethnic minority status
  - Poor health status
  - Low socioeconomic status
  - Increased age

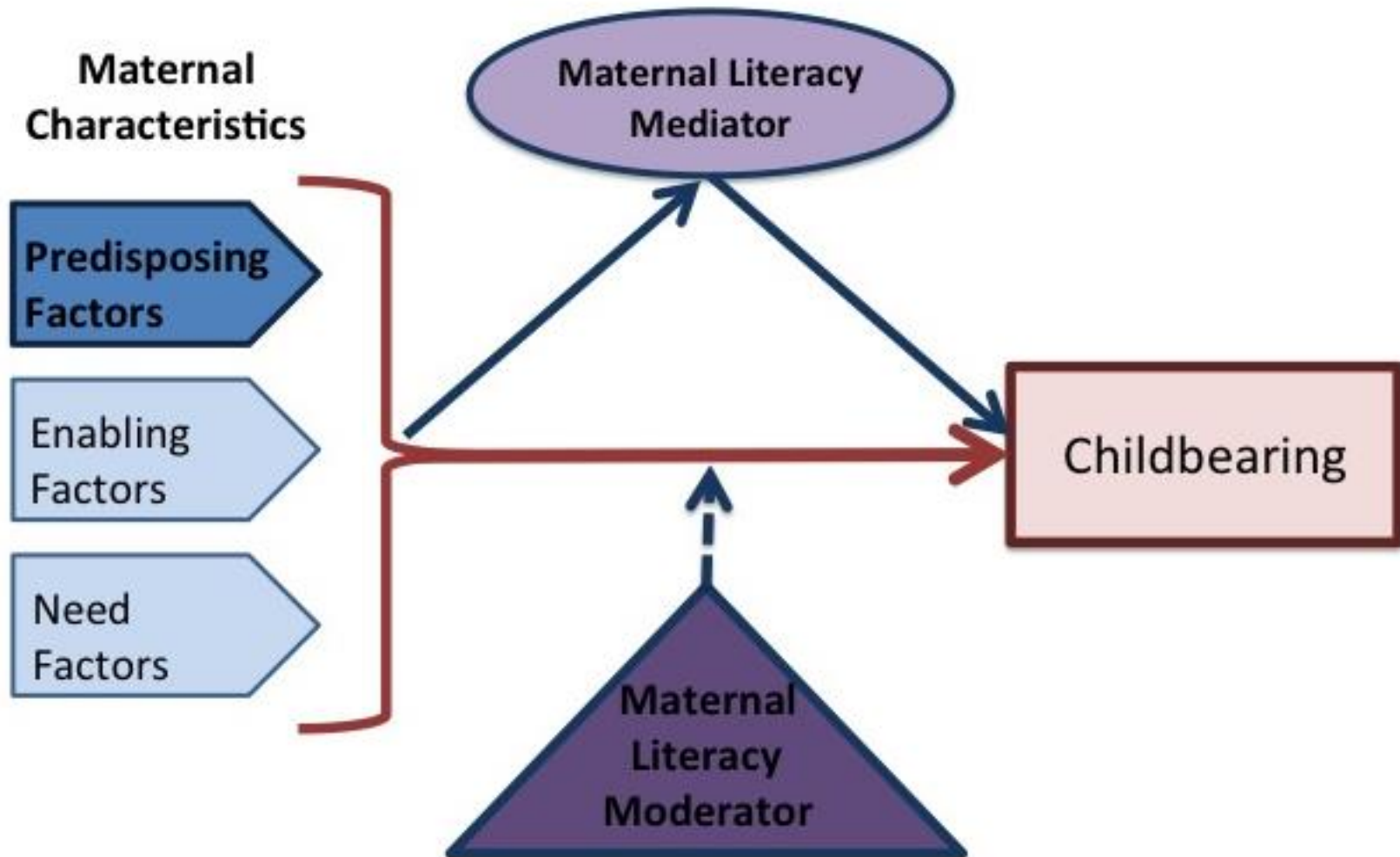
# Literacy and childbearing

- Existing literature from developing world shows associations between low literacy and:
  - ↑ birth rates at state, district, and individual level
- Relationship is understudied in the US and other high income countries

# Literacy – potential mechanisms

- Direct effect
  - Does literacy directly effect health?
- Or, does literacy influence other relationships?
  - Mediator
    - Does literacy account for the association of other risk factors on childbearing?
      - Effect of literacy and care use on health outcomes among elderly in US
  - Moderator
    - Does literacy interact with other risk factors in its influence on child bearing?
      - Effect of literacy and race on teen births in Philadelphia

# Mediator or Moderator?



Andersen's Behavioral Model



# Opportunity – PIAAC

- Multi-national data 2011-2012
  - OECD and partner nations
- Large dataset
- Precise and validated literacy measure

# Questions

- 1) Is **literacy** associated with **childbearing** in OECD and partner countries?
- 1) In these countries, does **literacy** work as either a **mediator** or **moderator** in the relationship between **self-reported health** and **childbearing**?

# Study population

- OECD
  - Czech Republic, Denmark, France, Ireland, Italy, Japan, the Republic of Korea, Netherlands, Belgium (Flanders), Norway, Poland, the Slovak Republic, Spain, Sweden, the United Kingdom, and the United States
- Partner countries
  - Cyprus, the Russian Federation
- Excluded based on data limitations
  - Canada, Australia, Austria, Estonia, Germany, and Finland

# Study Population Characteristics

Country	PIAAC Mean Children*	TFR WB*	PIAAC Literacy
United States	1.79	1.9	269.6
Ireland	1.63	2.0	265.2
Norway	1.58	1.9	276.7
Cyprus	1.57	1.5	269.9
France	1.55	2.0	262.2
Slovak Republic	1.55	1.5	274.2
Sweden	1.52	1.9	277.8
England/N. Ireland (UK)	1.51	1.9	271.6
Czech Republic	1.50	1.4	272.3
Flanders (Belgium)	1.48	1.8	272.8
Denmark	1.48	1.8	271.2
Netherlands	1.41	1.8	281.9
Japan	1.39	1.4	295.1
Korea	1.38	1.2	267.0
Spain	1.36	1.3	249.5
Poland	1.32	1.3	269.5
Italy	1.22	1.4	250.3
Russian Federation	1.21	1.6	278.0

TFR=Total Fertility Rate; WB = World Bank; \*Pearson's  $r = 0.606$  ( $P = 0.008$ )

# Evidence from PIAAC



Significant, inverse association

$p < 0.0001$  across OECD nations

Non-significant in Cyprus and Russia

# Literacy and Childbearing in the Study Population

Country	Coeff	P-val
United States	-0.0063	<0.0001
Ireland	-0.0065	<0.0001
Norway	-0.0029	<0.0001
Cyprus	-0.0020	0.105
France	-0.0075	<0.0001
Slovak Republic	-0.0091	<0.0001
Sweden	-0.0048	<0.0001
England/N. Ireland (UK)	-0.0035	<0.0001
Czech Republic	-0.0068	<0.0001
Flanders (Belgium)	-0.0029	<0.0001
Denmark	-0.0043	<0.0001
Netherlands	-0.0063	<0.0001
Japan	-0.0057	<0.0001
Korea	-0.0099	<0.0001
Spain	-0.0064	<0.0001
Poland	-0.0075	<0.0001
Italy	-0.0058	<0.0001
Russian Federation	-0.00037	0.718



# Evidence from PIAAC, continued

**Literacy**



**Self-reported  
health**

Significant, positive association  
 $p < 0.0001$  across OECD and partners

## Evidence from PIAAC, continued

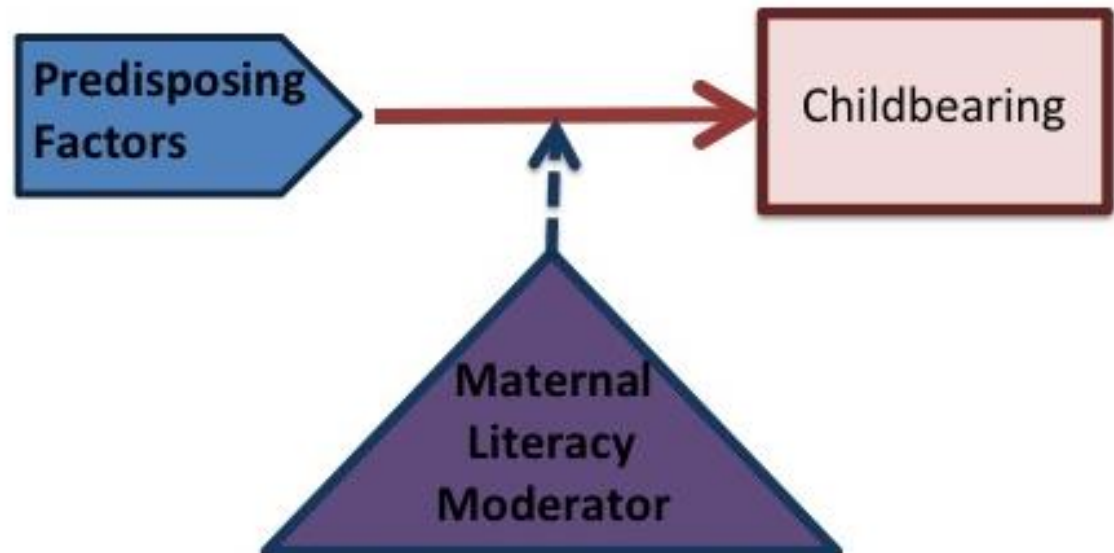


Significant association for  
at least one health category  
 $p < 0.0001$  across OECD and partners

# Moderation

- Is literacy related to childbearing? ✓
- Is self-reported health related to childbearing? ✓
- Do self-reported health and literacy together create differing effects than the two individually?

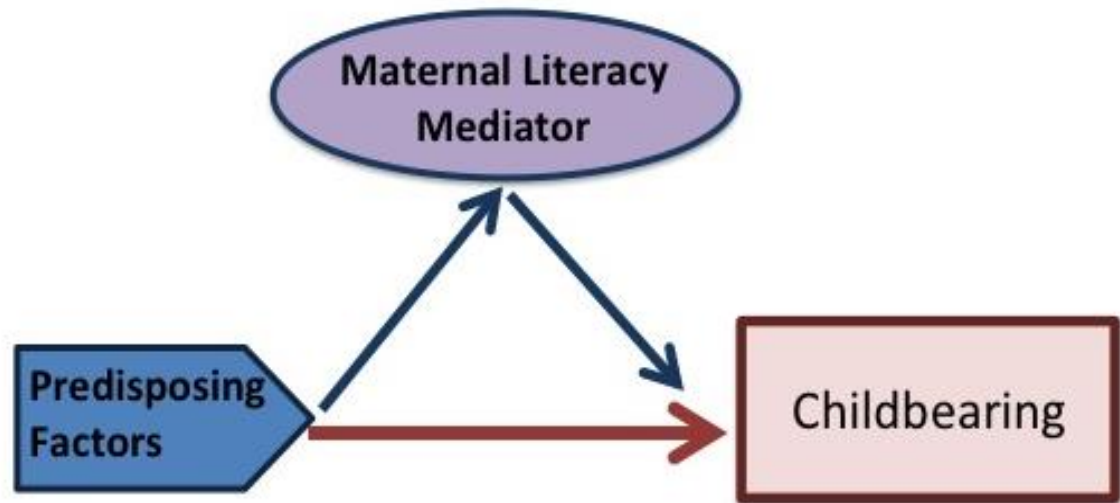
Is an interaction term between literacy and childbearing significant?



# Mediation

- Is literacy related to parity? ✓
- Is self-reported health related to parity? ✓
- Including both literacy and self-reported health in a model, is:

- literacy significantly associated with childbearing?
- self-reported health less associated?



Adjusted for age

# Conclusions

- Literacy is significantly, inversely associated with childbearing across OECD nations
  - Consistent with results from low and middle income countries
- No evidence to support moderation hypothesis
- Evidence to support mediation hypothesis

# Implications

- Investigations of childbearing in OECD nations should consider literacy
  - Traditional explanatory variables reflect distinct aspects of a relational model
  - Literacy is
    - a modifiable variable
    - influences health and economic independence
    - has impact across the life course
- Mediation
  - Literacy lies on a pathway to childbearing

# Strengths and limitations

- Strengths:
  - Big data set
    - Comparison across countries
  - Precise and validated literacy assessment
- Limitations:
  - Cross-sectional
  - Self-report
  - Possible misclassification of outcome