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Leibniz Institute  
for the Social Sciences



# The Impact of Assessment Features on Adults' Literacy Skills

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# 1

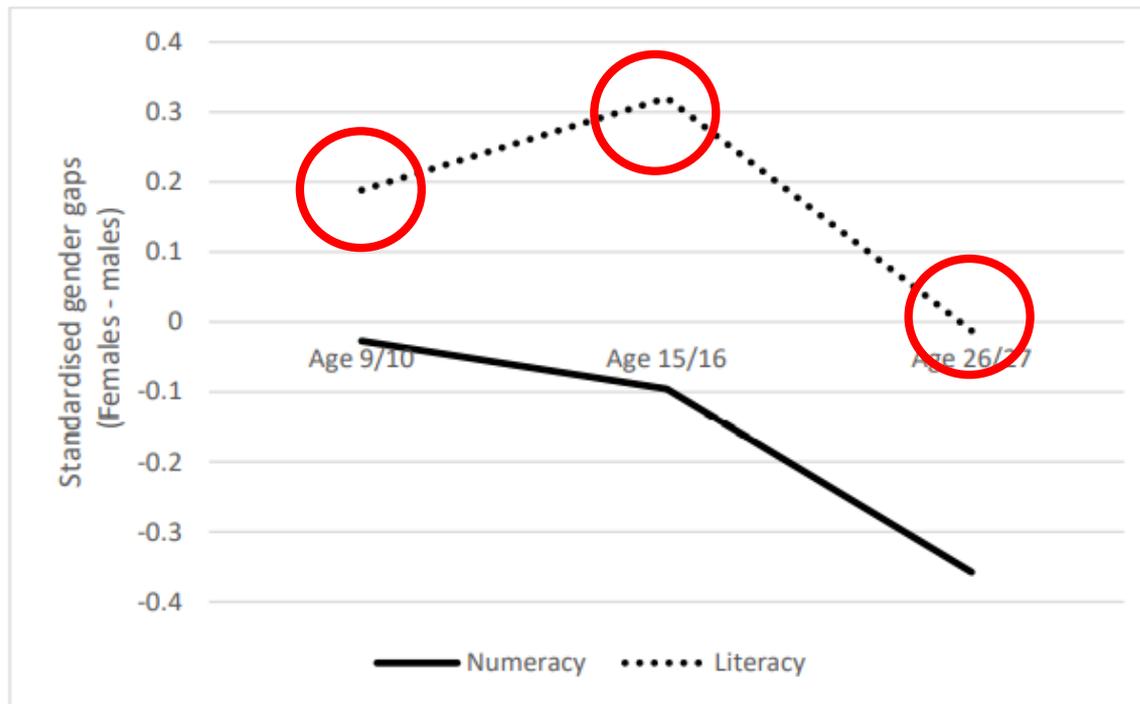
# Introduction

# Literacy Skills Are Important!

- **Definition of literacy in PIAAC**
  - *Understanding, evaluating, using and engaging with written texts to participate in society, to achieve one's goals, and to develop one's knowledge and potential.*
- **Literacy skills are important for...**
  - Everyday life communication, social media, education work, and societal participation

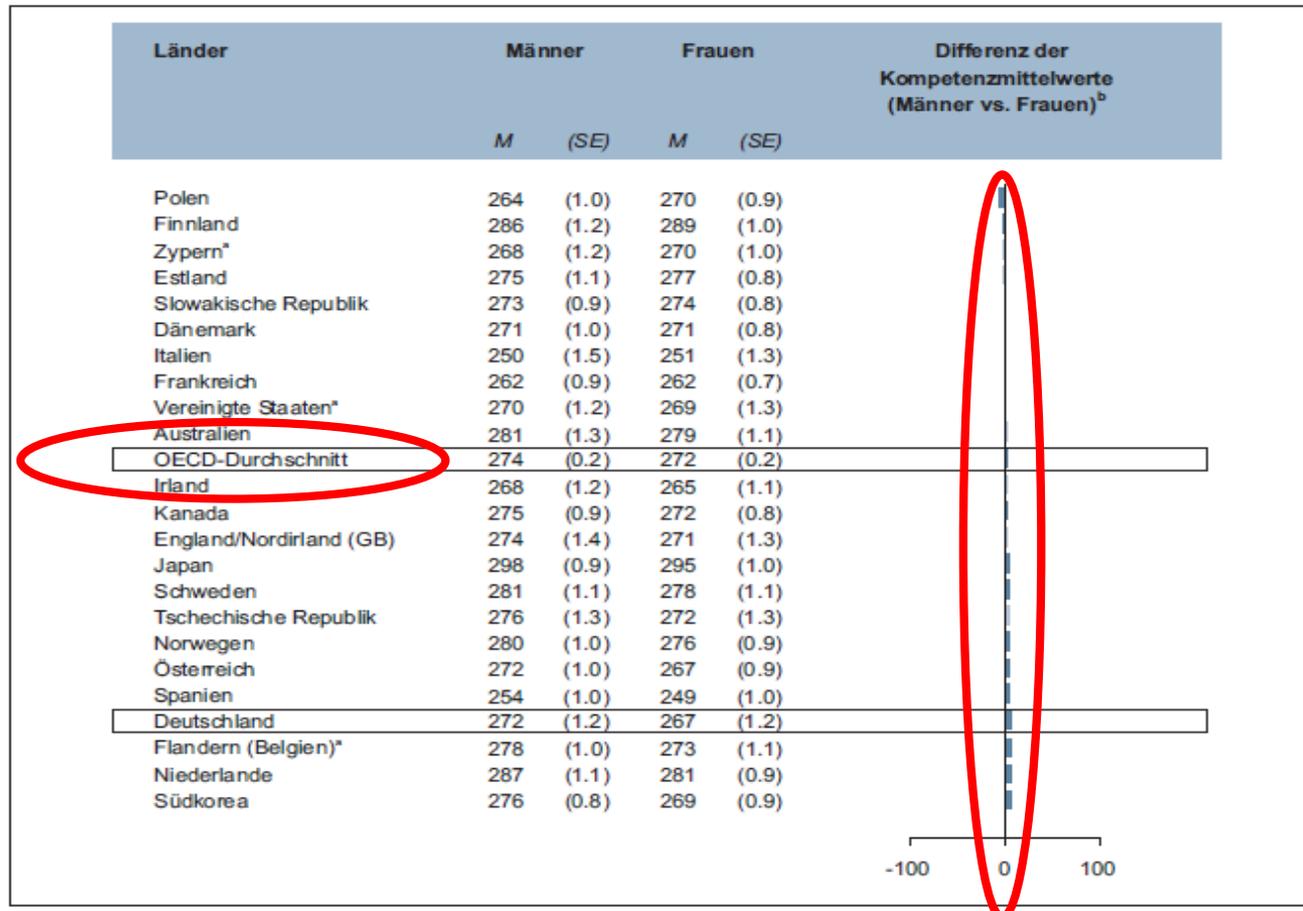
# Gender Gaps in Literacy Skills in Childhood and Youth

Figure 3.1. Evolution of gender gaps in numeracy and literacy



(Borgonovi et al., 2018)

# Gender Gaps in Literacy Skills in Adulthood



## Open Questions

- *Why do gender differences in literacy increase throughout the childhood/adolescence but decrease or even disappear during the adulthood?*

### **Developmental**

- Are men “catching up” or are women “losing” skills?

### **Methodological**

- Are some literacy assessments (PIRLS, PISA) more prone to gender differences than others (PIAAC)?

# Previous Evidence on Assessment Features & Gender

- **Text types**

Boys read short & non-continuous texts better.

- **Item format**

Boys respond better to multiple-choice items than open-ended questions (with written response).

- **Aspect of reading**

Boys respond better to „access & retrieve“ tasks than to „evaluate & reflect“ tasks.

(Solheim & Lundetræ, 2018)

## The Present Study

- Our **goal** is to investigate the impact of assessment features on gender differences in literacy skills among adults.
- Our study is **important** for accurately estimating & interpreting gender gaps in literacy skills.
- Our study is **useful** for constructing a literacy test that is free from gender response bias.

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# Method

## Data & Sample

- **Data:**
  - PIAAC (Germany)
  - Collected in 2011-2012
- **Sample:**
  - Adults (16-65 years old)
  - N = 4512 (computer-based data only)
  - Gender ratio: approx. 50%

# Measures

## ■ Assessment Features

1. Text topics: community, education, personal, work
  2. Text format: continuous, non-continuous, mixed
  3. Cognitive strategy: access and identify; integrate and interpret; evaluate and reflect
  4. \*Text length: short, medium/long
  5. \*Numerical content of text: low, medium, high
  6. \*Gender-typicality: feminine, masculine, neutral
- \*our own classification

# Sample Item



Look at the list of preschool rules. Highlight information in the list to answer the question below.

What is the latest time that children should arrive at preschool?

## Preschool Rules

Welcome to our Preschool! We are looking forward to a great year of fun, learning and getting to know each other. Please take a moment to review our preschool rules.

- Please have your child here by 9:00 am.
- Bring a small blanket or pillow and/or a small soft toy for naptime.
- Dress your child comfortably and bring a change of clothing.
- Please no jewelry or candy. If your child has a birthday please talk to your child's teacher about a special snack for the children.
- Please bring your child fully dressed, no pajamas.
- Please sign in with your full signature. This is a licensing regulation. Thank you.
- Breakfast will be served until 7:30 am.
- Medications have to be in original, labeled containers and must be signed into the medication sheet located in each classroom.
- If you have any questions, please talk to your classroom teacher or to Ms. Marlene or Ms. Tree.

Context: personal	Length: short
Strategy: access & identify	Numerical content: some
Format: non-continuous	Gender bias: slightly female

# Statistical Analysis

- **Linear probability model**
- **DV:** a probability of solving an item correctly with certain assessment features
- **IV:** gender (female or male)
- **Controlling variables:**
  - Education levels, native language
  - Employment status, children, and reading behavior
  - Item difficulty, core items, sequence of skill domains
  - (Correlated) assessment features

# 3

# Results

# The Impact of assessment features on gender differences

**No**

Text topics

Gender typicality

Cognitive strategy

**Yes**

Text Length

Text format

Numerical content

## Assessment Features Matter...

- **Text length:** men have 9% higher probability of solving items correctly for short-texts.
- **Text format:** men have 14% higher probability of solving items correctly for non-continuous texts.
- **Numerical content:** men have 4-6% higher probability of solving items correctly for texts with medium-high numerical content.
- **Text topic:** men have 4-5% higher probability of solving items correctly for texts with “Education” content.

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# Discussion

## Key Findings

- Overall, PIAAC literacy test is a gender neutral assessment in terms of assessment features.
- Gender differences depend on some assessment features but not others.
- Text length, format, and numerical content matter for gender differences.
- Text topics, gender-typicality, cognitive strategy do not matter much for gender differences.

## Limitations and Future Directions

- No test items in PIAAC which require a written response (open-ended questions).
- The results limited to only computer-based items.
- The results limited to literacy in German language.
- More research is needed to disentangle the evolution of gender differences throughout the life course.

## Implications and Conclusions

*“Why are gender differences in literacy observed for children/adolescents but not for adults?”*

- We don't know the answer yet...but some gender differences (often observed in younger cohorts) may be due to assessment features.
- More cautions are needed when interpreting gender differences in literacy scores.
- Our findings may be helpful for more gender-neutral test constructions.



Thank you for your attention!

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