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Advancing Digital Equity in Public Libraries: Assessing Library Patrons' Problem Solving in Technology Rich Environments

5-2017

Teaching for Digital Equity: Examining Digital Problem Solving in a Public Library

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TEACHING FOR DIGITAL EQUITY: EXAMINING DIGITAL PROBLEM SOLVING IN A PUBLIC LIBRARY

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In Collaboration with Multnomah County Library, Portland, OR, USA

THIS WORK IS SUPPORTED BY

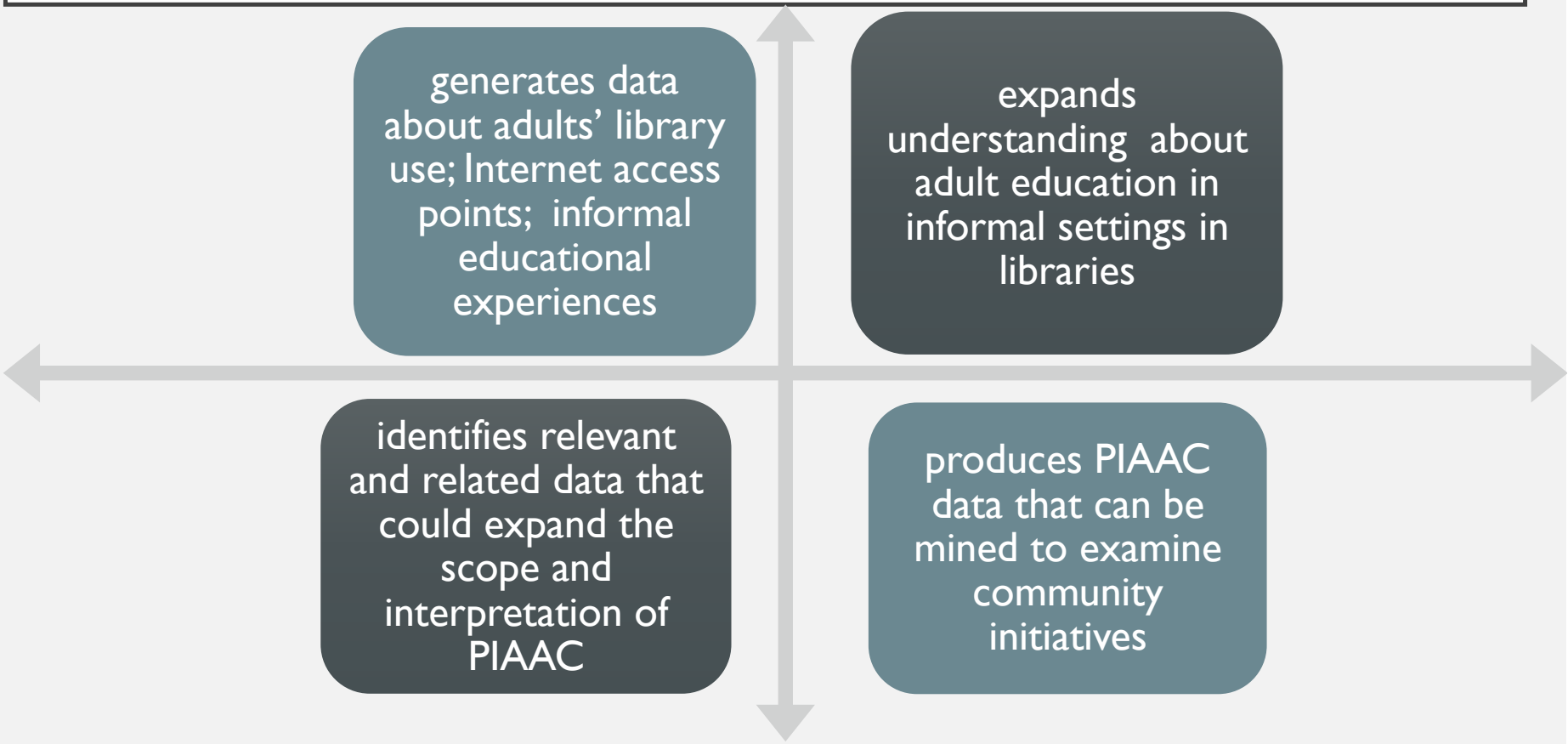
Advancing Digital Equity in Public Libraries: Assessing Library Patrons' Problem Solving in Technology Rich Environments (NATIONAL LEADERSHIP GRANT-06-14-0076)

EDUCATION AND SKILLS ONLINE

The Online version of the Survey of Adult Skills (PIAAC)
A joint initiative of the OECD and the European Union

- **Education & Skills Online** is an assessment tool designed to provide individual-level results that are linked to the OECD Survey of Adult Skills (PIAAC).
- Institutions, organizations or local governments can use the online tool to assess the skills of a particular population with the goal of providing training or for research purposes.

PIAAC'S BACKGROUND QUESTIONNAIRE DOESN'T INCLUDE ANY QUESTIONS ABOUT LIBRARY USE WHY SHOULD IT?



Problem solving in technology rich environments

PSTRE

Using digital technology, communication tools and networks to **acquire and evaluate information, communicate** with others and **perform practical tasks**

in 3 domains

Personal, Workplace, Civic

WHY ARE PSTRE DATA RELEVANT FOR LIBRARIES?

Libraries of all types…

- Support interest-driven lifelong learning
- Provide hubs for Internet access and digital literacy training
- Deliver content & services using technology

Include libraries in workforce development through the use of the PIAAC

PURPOSE OF THIS RESEARCH

Extend national work on digital literacy acquisition to inform local efforts

PIAAC

Programme for the International Assessment of Adult Competencies

Bring libraries into the PIAAC conversation

Maximize resources and meet community needs around lifelong learning and access

SAMPLING AND DATA SOURCES (N=195)

Who did we sample?

- Face-to-face in Library Branches
- Face-to-face Library Outreach Community
- Distributed Link using the Library's newsletter

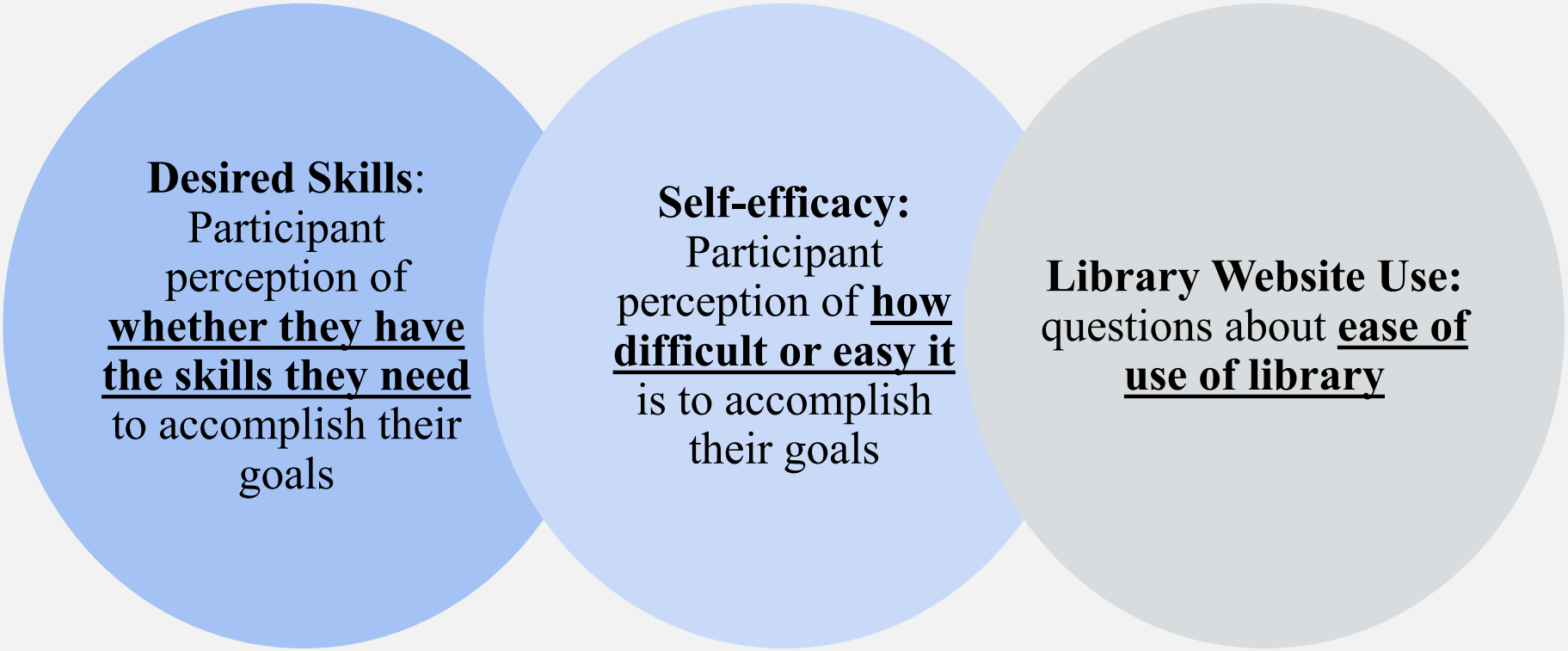
What were the data sources?

- Researcher designed survey focused on online access and library use
- PSTRE assessment from Education and Skills Online

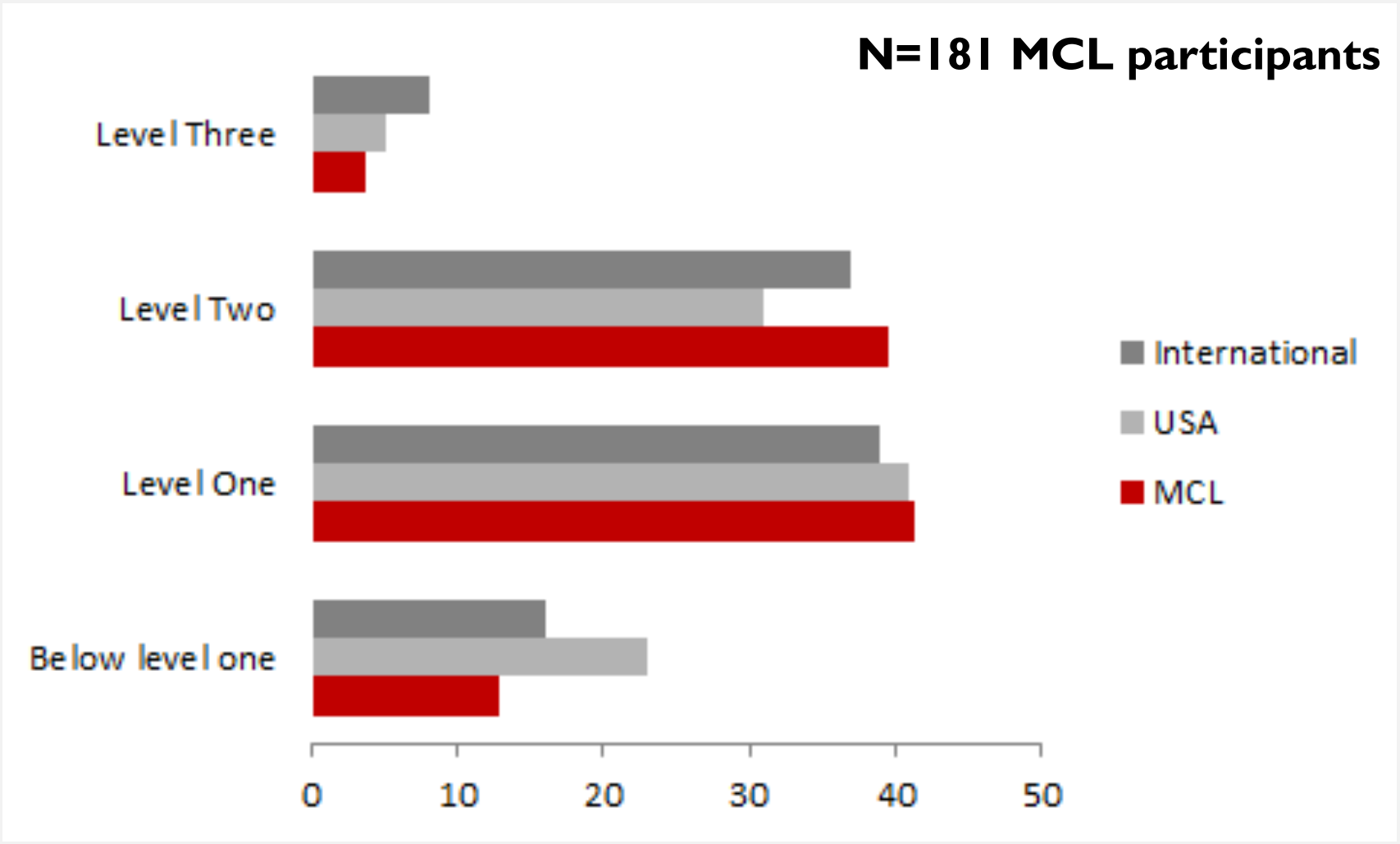
How did we learn about individual approaches to digital problem solving?

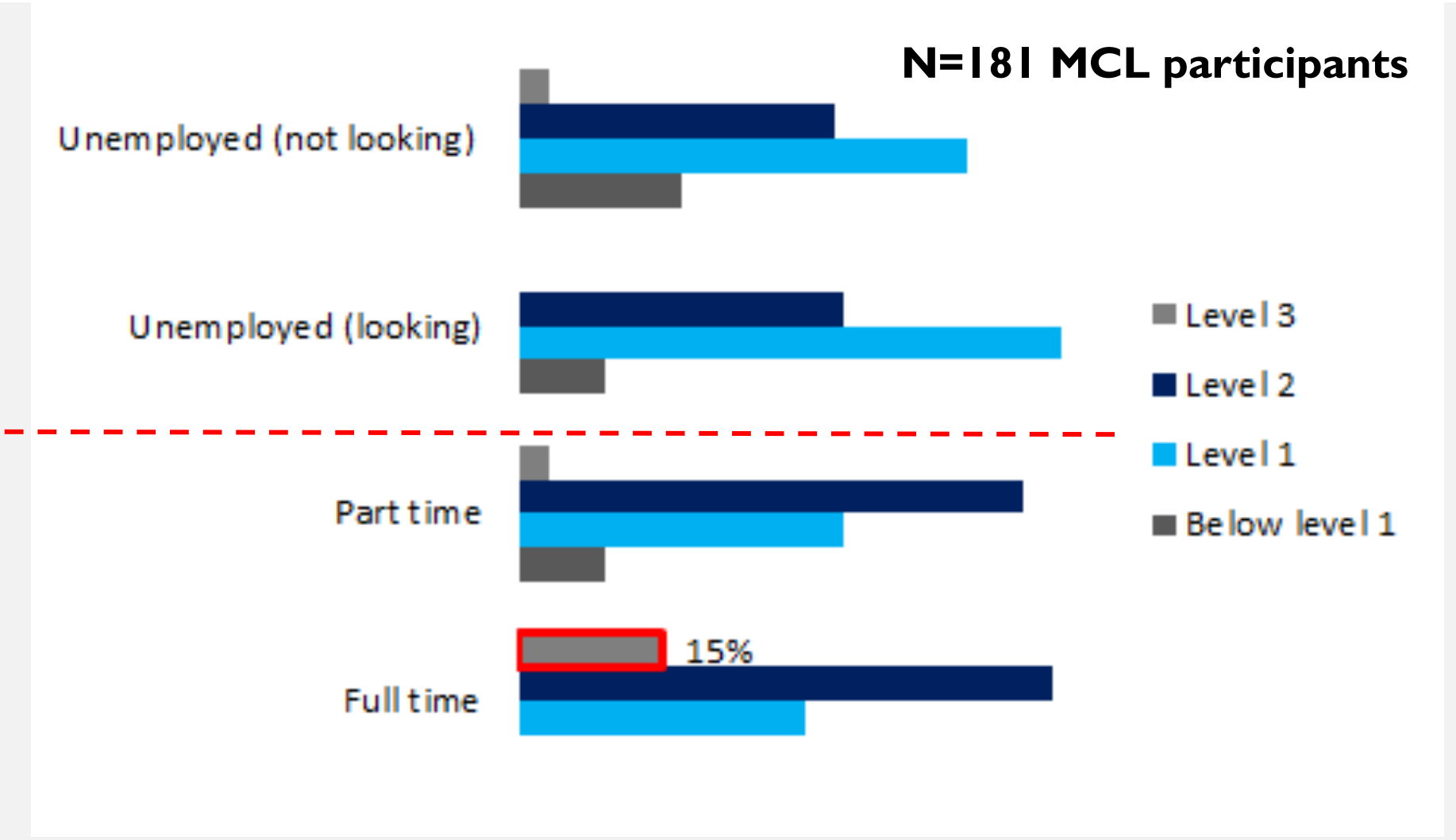
- Screen recording
- Verbal Protocol Analysis

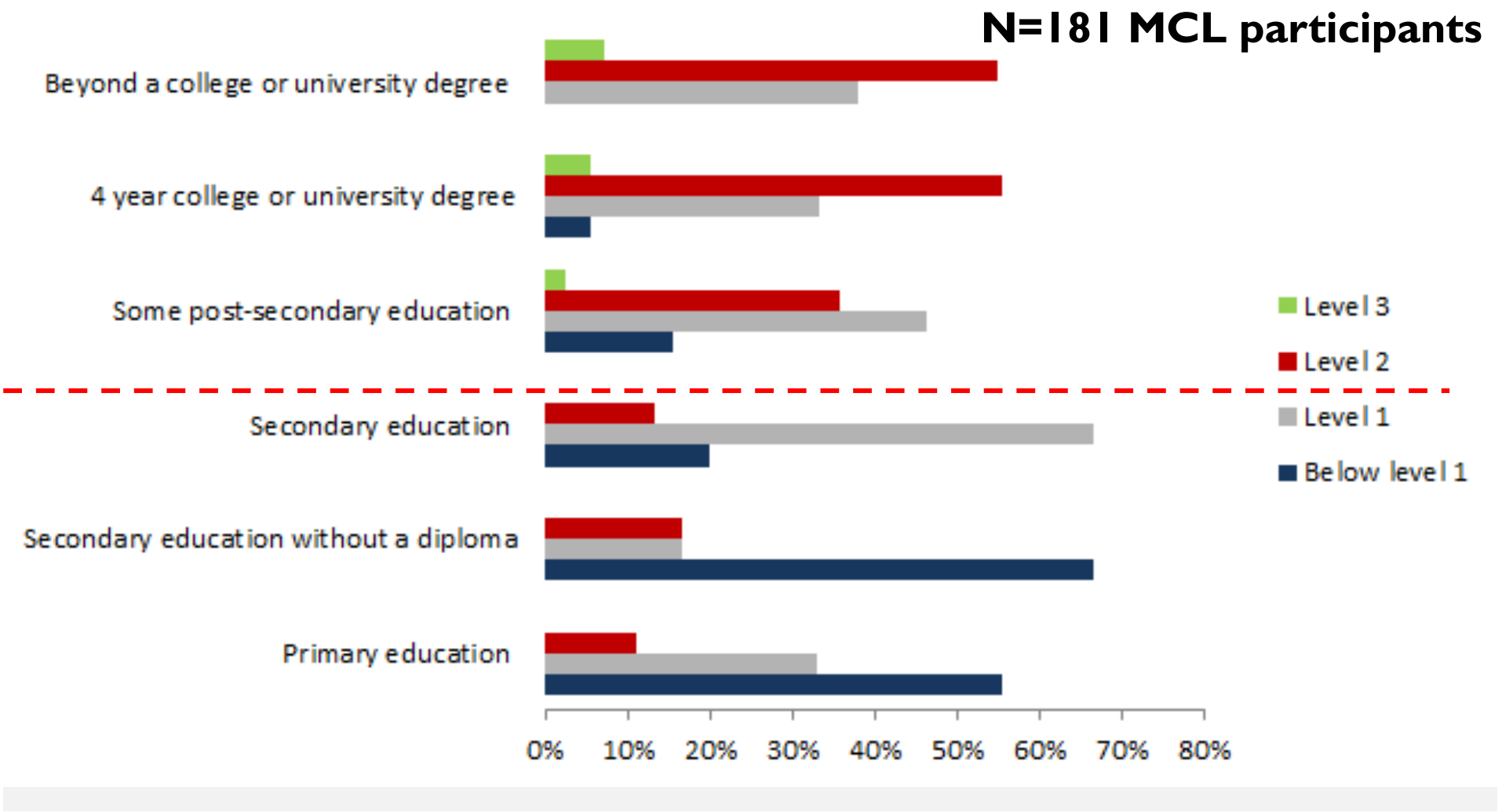
ADDITIONAL VARIABLES EXAMINED



RESEARCH FINDINGS

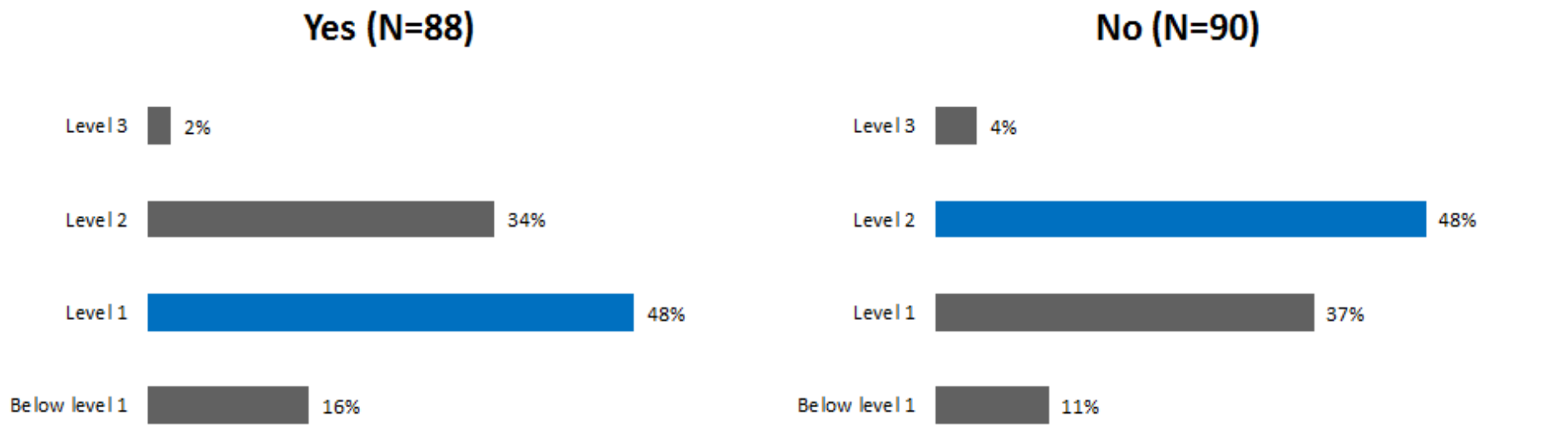

N=181 MCL participants
Level Three
Level Two
Level One
Below level one
0
10
20
30
40
50
International
USA
MCL


N=181 MCL participants
Unemployed (not looking)
Unemployed (looking)
Part time
Full time
15%
Level 3
Level 2
Level 1
Below level 1

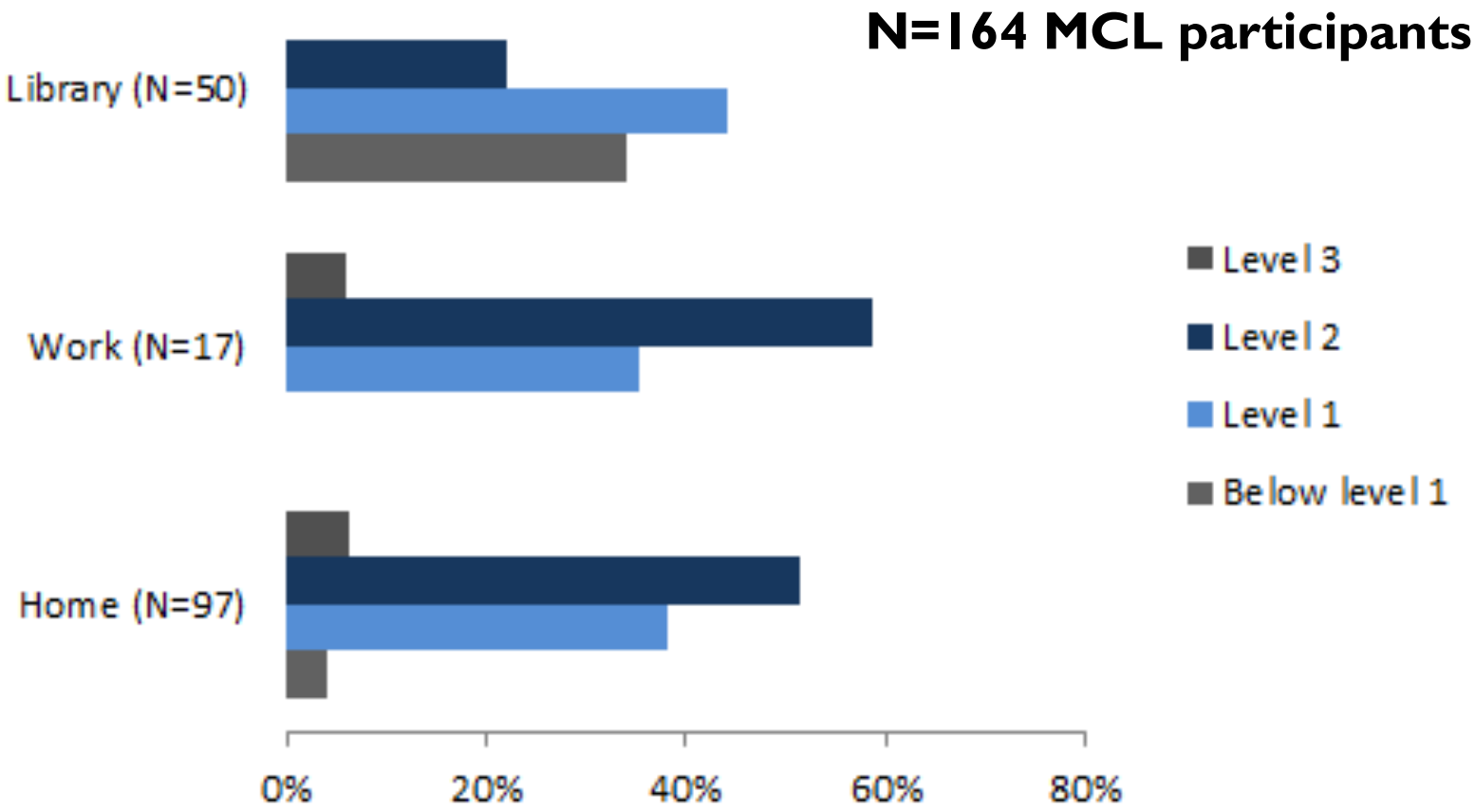

N=181 MCL participants
Beyond a college or university degree
4 year college or university degree
Some post-secondary education
Secondary education
Secondary education without a diploma
Primary education
Level 3
Level 2
Level 1
Below level 1
0%
10%
20%
30%
40%
50%
60%
70%
80%

ACCESS INTERNET MOSTLY FROM A MOBILE DEVICE?

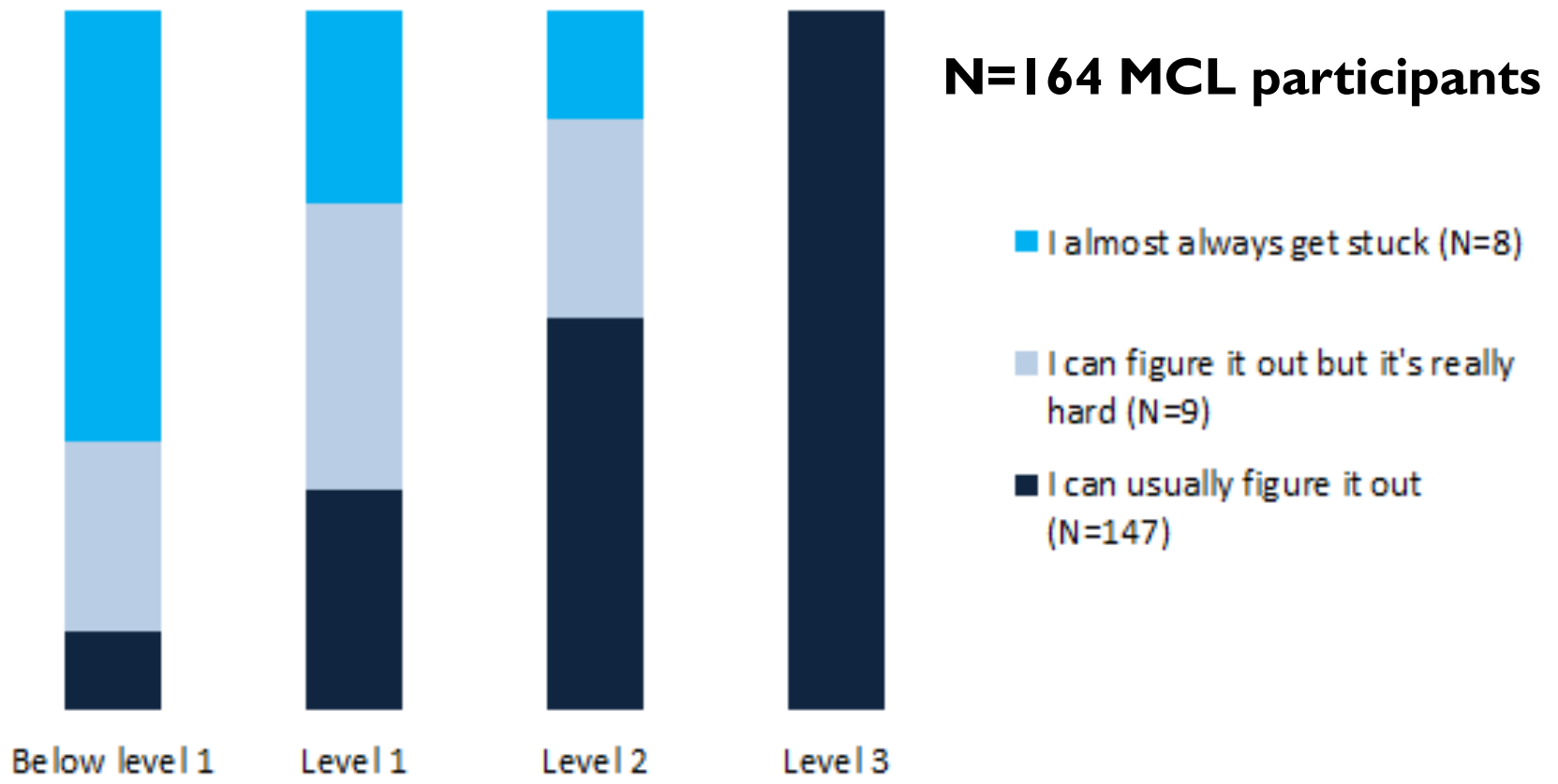
N=178 MCL participants



WHERE DO YOU ACCESS THE INTERNET MOST OFTEN?

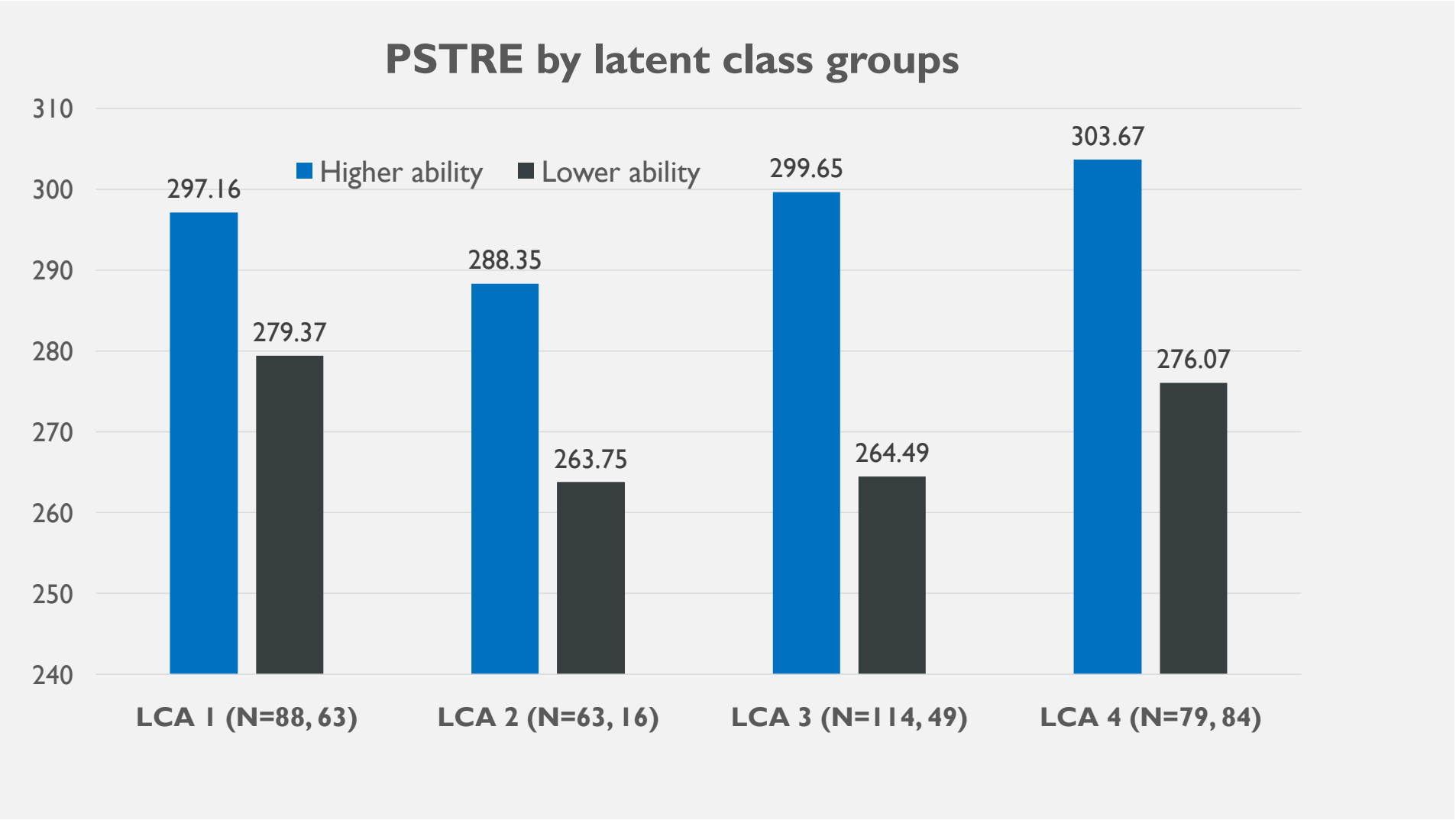


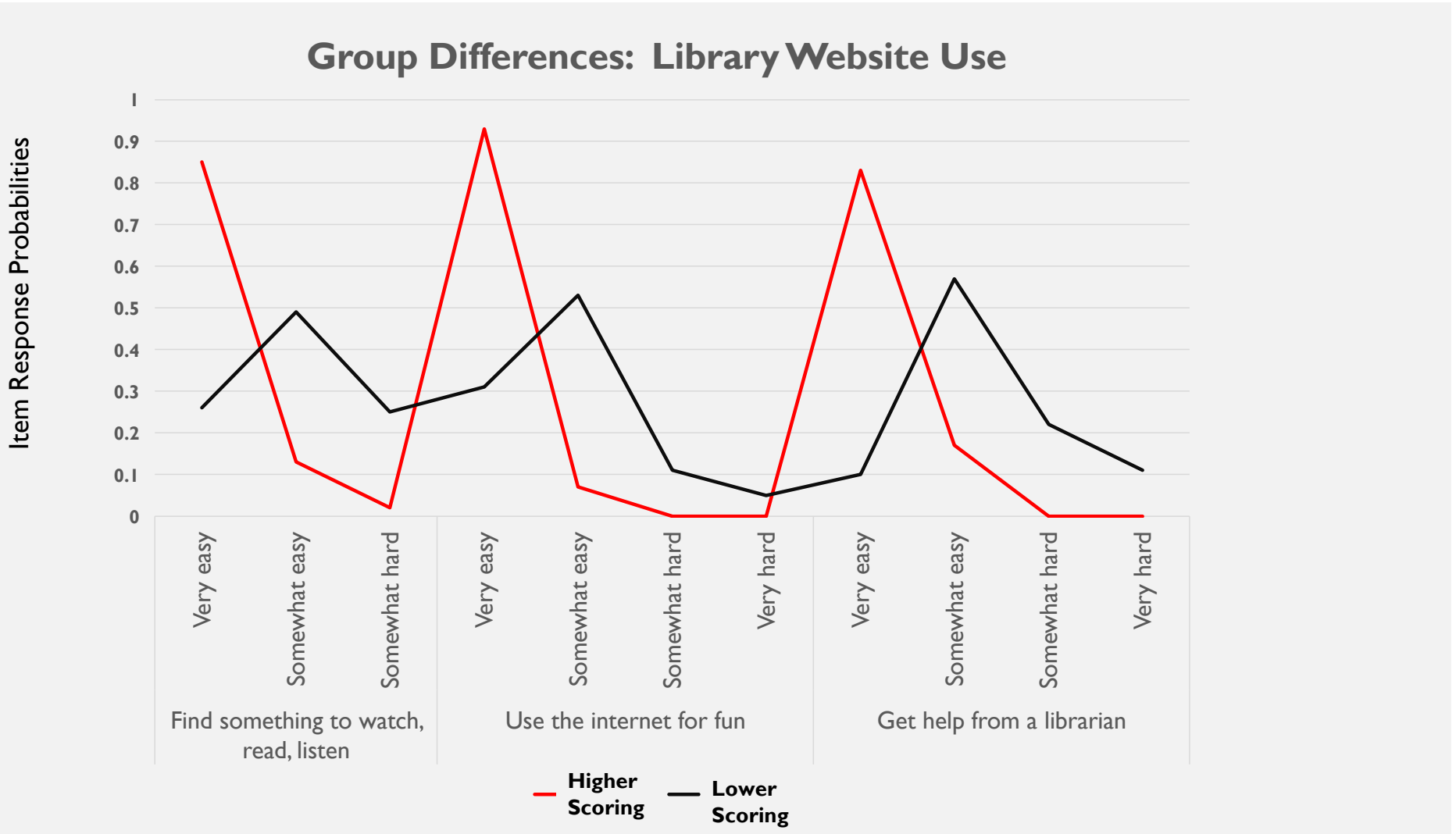
WHEN I'M DOING SOMETHING ONLINE…

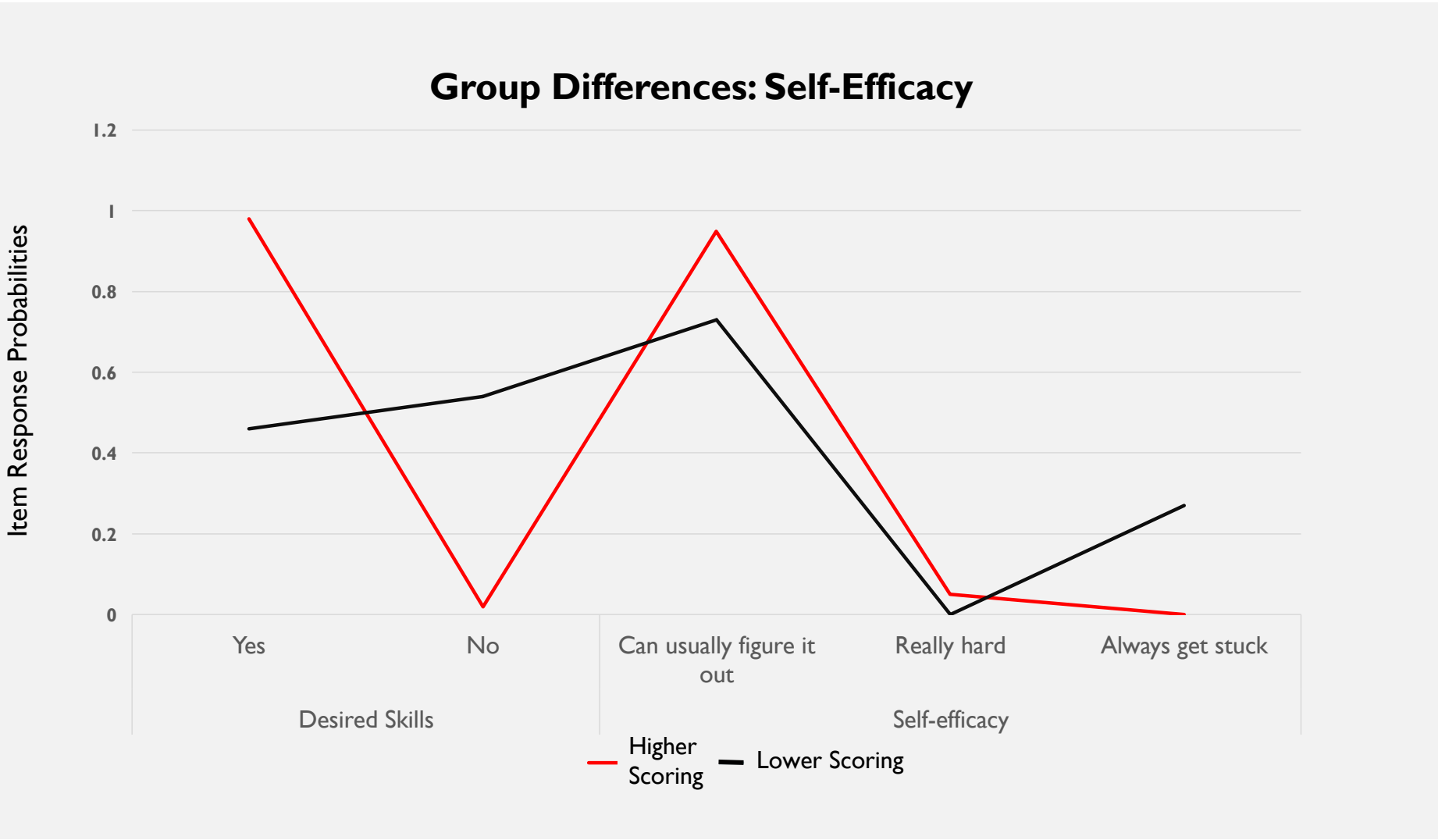


LATENT CLASS ANALYSIS

COMPARING HIGHER SKILLED AND LOWER SKILLED GROUPS


PSTRE by latent class groups
310
300
290
280
270
260
250
240
Higher ability
Lower ability
297.16
279.37
288.35
263.75
299.65
264.49
303.67
276.07
LCA 1 (N=88, 63)
LCA 2 (N=63, 16)
LCA 3 (N=114, 49)
LCA 4 (N=79, 84)


Group Differences: Library Website Use
Item Response Probabilities
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Very easy
Somewhat easy
Somewhat hard
Very easy
Somewhat easy
Somewhat hard
Very hard
Very easy
Somewhat easy
Somewhat hard
Very hard
Find something to watch, read, listen
Use the internet for fun
Get help from a librarian
Higher Scoring
Lower Scoring

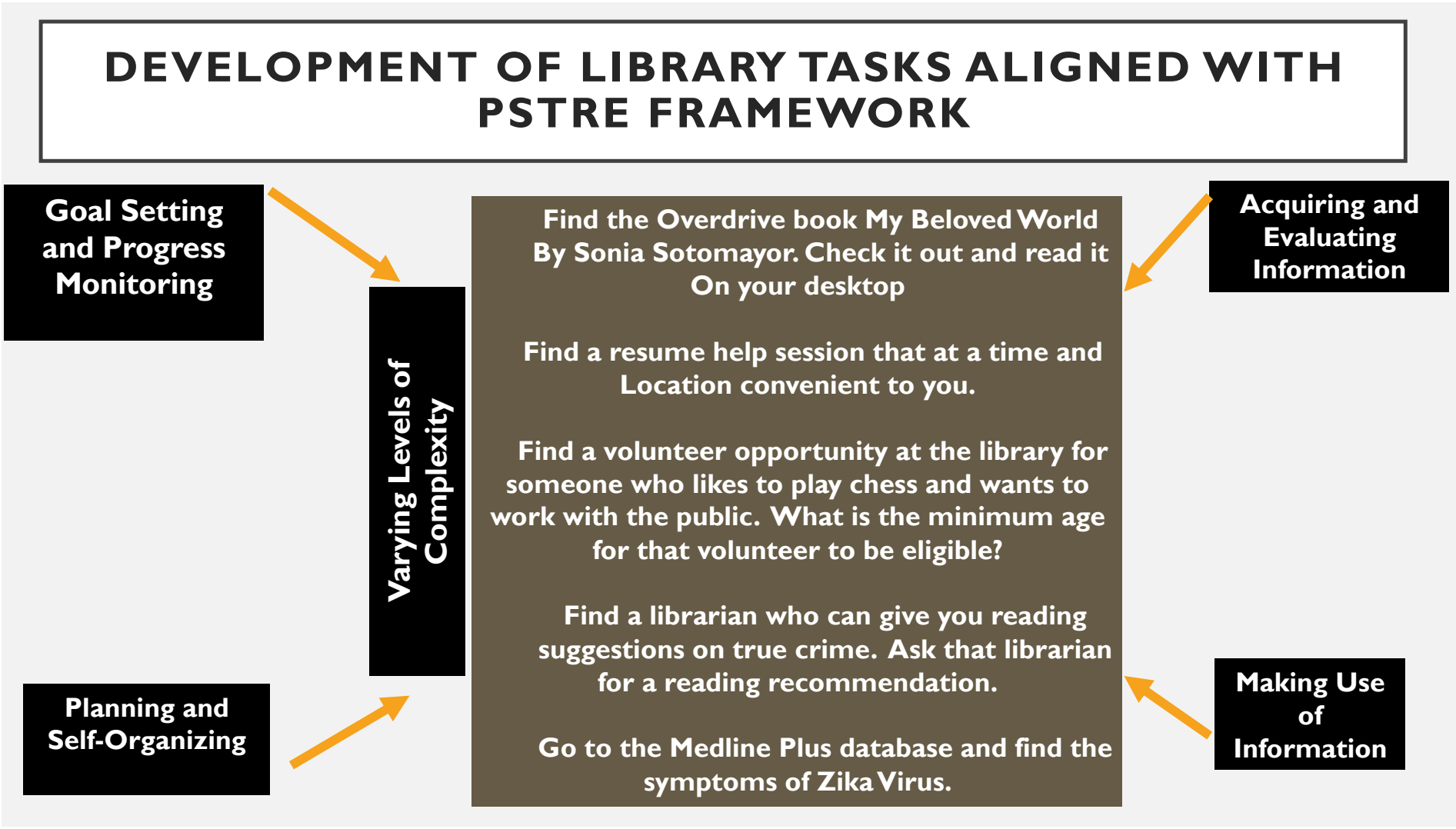

Group Differences: Self-Efficacy
Item Response Probabilities
1.2
1
0.8
0.6
0.4
0.2
0
Yes
No
Can usually figure it out
Really hard
Always get stuck
Desired Skills
Self-efficacy
Higher Scoring
Lower Scoring

OBSERVATIONS OF DIGITAL PROBLEM SOLVING: LIBRARY TASKS

PSTRE FRAMEWORK: DIMENSIONS OF DIGITAL PROBLEM SOLVING

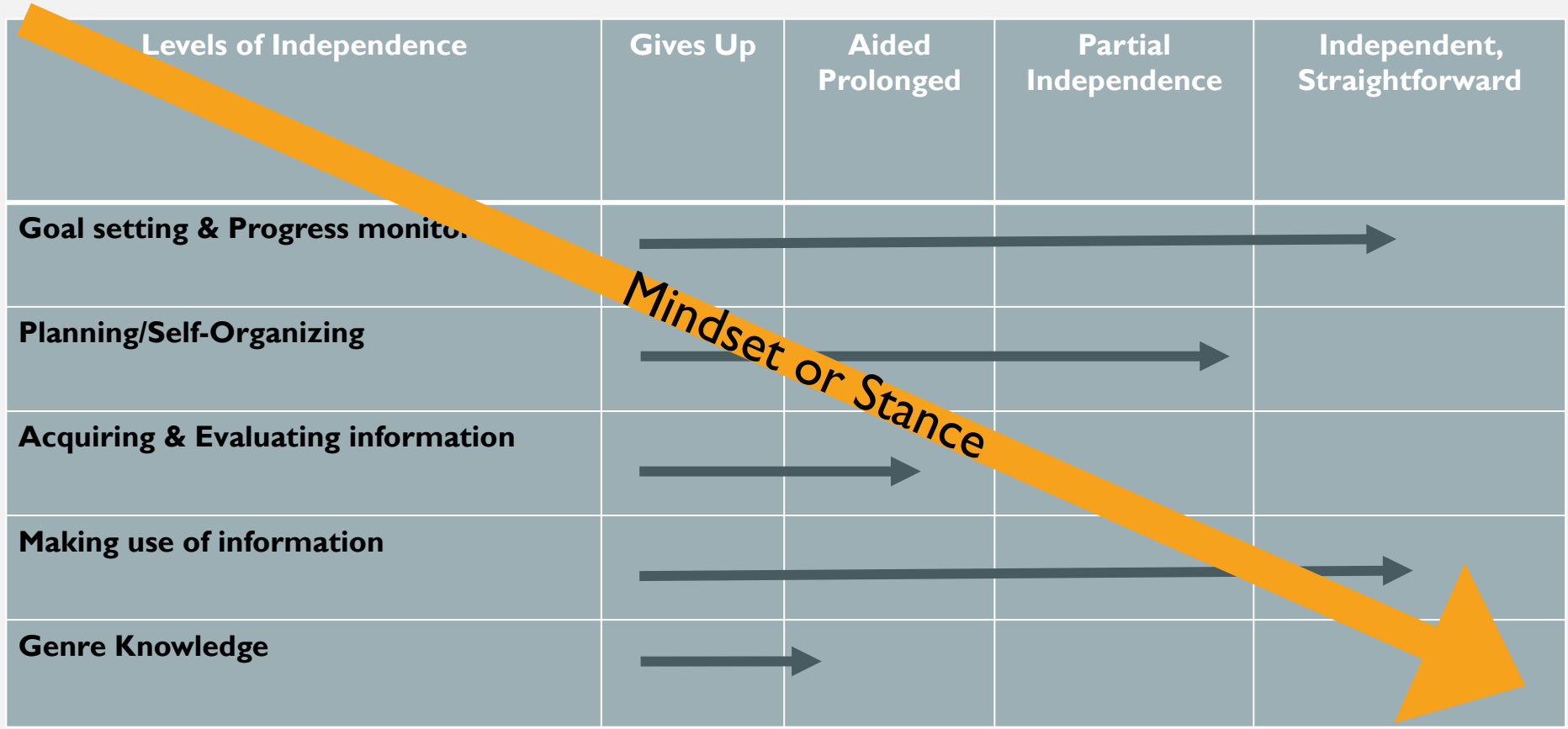
PSTRE Cognitive Dimension	Example
Goal Setting and Progress Monitoring	Identifying needs, Detecting and interpreting unexpected events impasses or breakdowns
Planning and Self-Organizing	Setting up plans, procedures, and strategies Selecting resources and categories
Acquiring and Evaluating Information	Selecting Information, Assessing Reliability, Reasoning about Sources and Contexts
Making Use of Information	Organizing Information, Transforming Information, Communicating with relevant parties

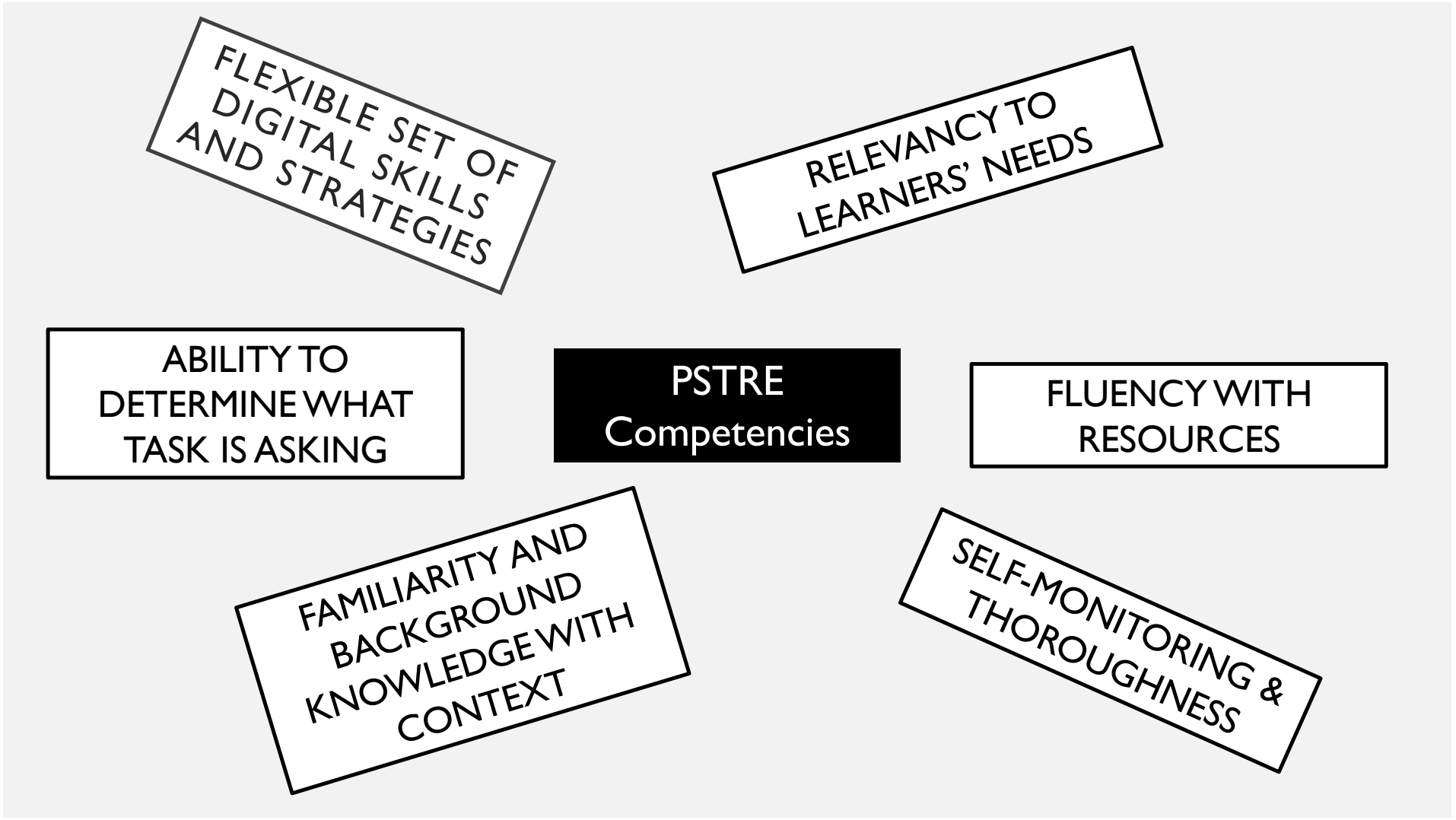
DEVELOPMENT OF LIBRARY TASKS ALIGNED WITH PSTRE FRAMEWORK



A COMPLEX MODEL OF DIGITAL PROBLEM SOLVING

OBSERVATIONAL PROTOCOL




FLEXIBLE SET OF DIGITAL SKILLS AND STRATEGIES
RELEVANCY TO LEARNERS' NEEDS
ABILITY TO DETERMINE WHAT TASK IS ASKING
PSTRE Competencies
FLUENCY WITH RESOURCES
FAMILIARITY AND BACKGROUND KNOWLEDGE WITH CONTEXT
SELF-MONITORING & THOROUGHNESS

There might be a better way to do this, but I'm sticking with what I know works.

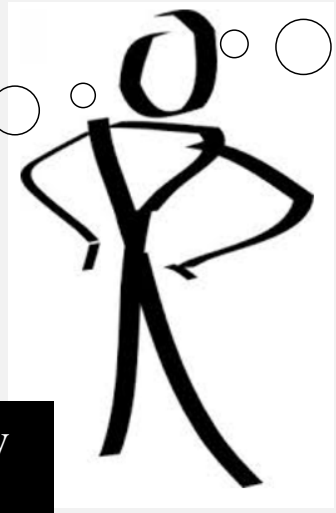
The Schematic Mindset

I'm going to go step-by-step to figure this out.

The Procedural Mindset

I'm going to explore all the different resources and tools available and click around to see what features it has that could be useful.

The Exploratory Mindset



What I did before, and the resources I used with other tasks, can help me with what I'm trying to do here.

The Learn from Experience Mindset

CONCLUSIONS

- **Digital Problem Solving is complex** and multi-dimensional – to explore the full range, we need to look at both **scores and observations**
  - **PSTRE Competencies are fluid** and cut across tasks, use of resources, and contexts
  - **Mindsets and stances also shift** across tasks and contexts; within individuals
  - Comparisons can be made across **PSTRE and library tasks**
  - **Levels of Support can** provide a means of scaffolding both competencies and mindsets

DIGITAL LITERACY ACQUISITION AND EQUITY RESEARCH HUB

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Thank you for your attention