Intellectual Disability and numerate behaviour in everyday contexts:
Designing tools

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Assoc Prof Karen Moni
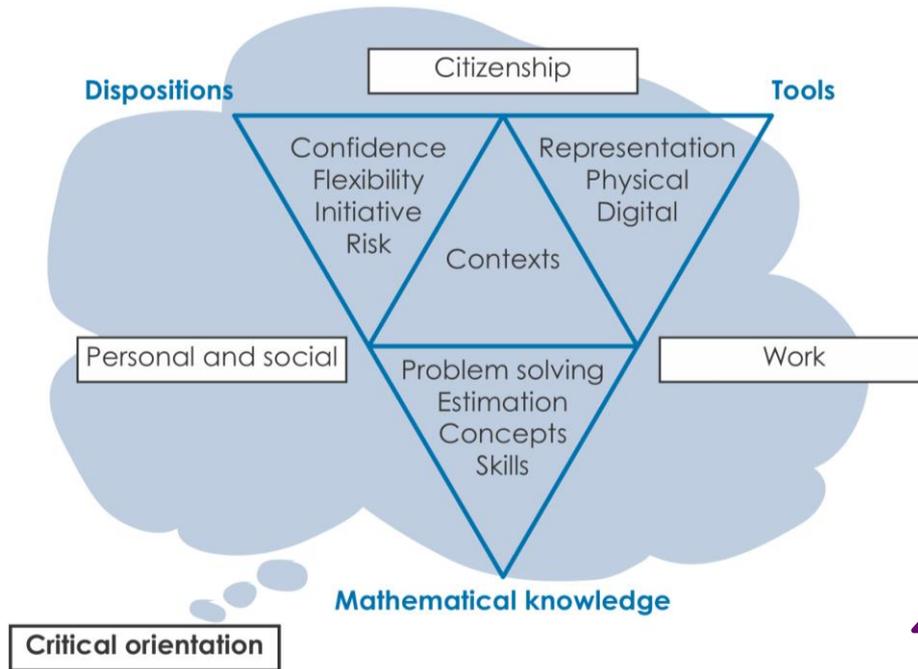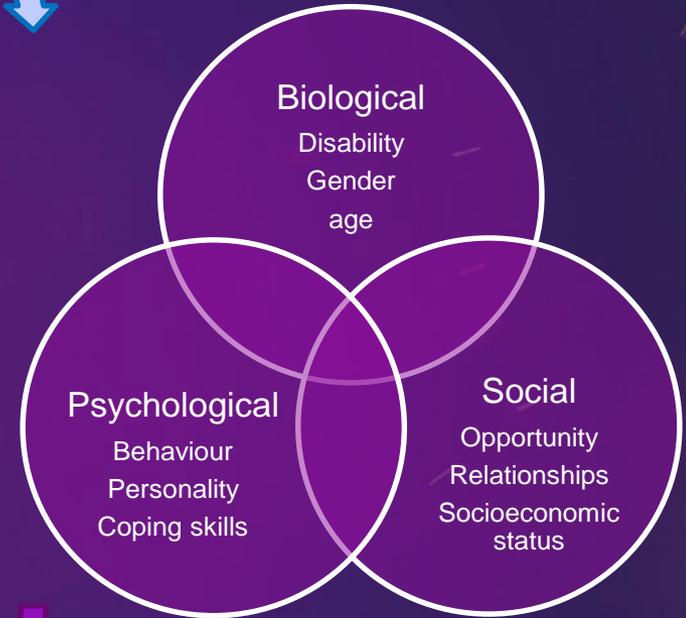
Dr Jana Visnovska

Aim

Explore the numeracy demands and opportunities
of everyday situations
for a group of adults with ID

Theoretical Framework

Numeracy Model (Goos 2007)

Biopsychosocial Model of Disability (Engel, 1977)

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The study

Conducted in three stages with four participants

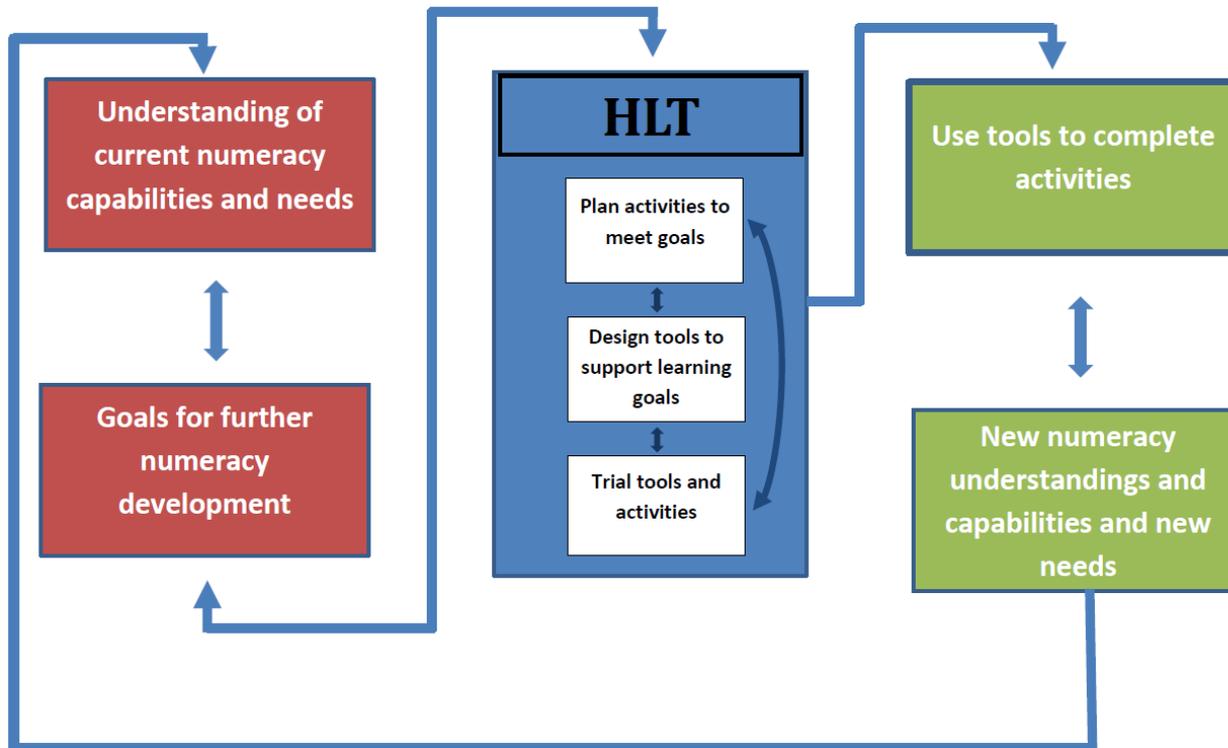- Pilot study
- **Phase 1**
- **Phase 2**

Data collection

- **Observations**
- Interviews

Data Analysis methods

- Deductive analysis based on themes from the numeracy and disability models

Personalised Numeracy Support Design Cycle

Understanding of current numeracy capabilities and needs

Goals for further numeracy development

HLT

Plan activities to meet goals

Design tools to support learning goals

Trial tools and activities

Use tools to complete activities

New numeracy understandings and capabilities and new needs

Personalised Numeracy Support Design Cycle
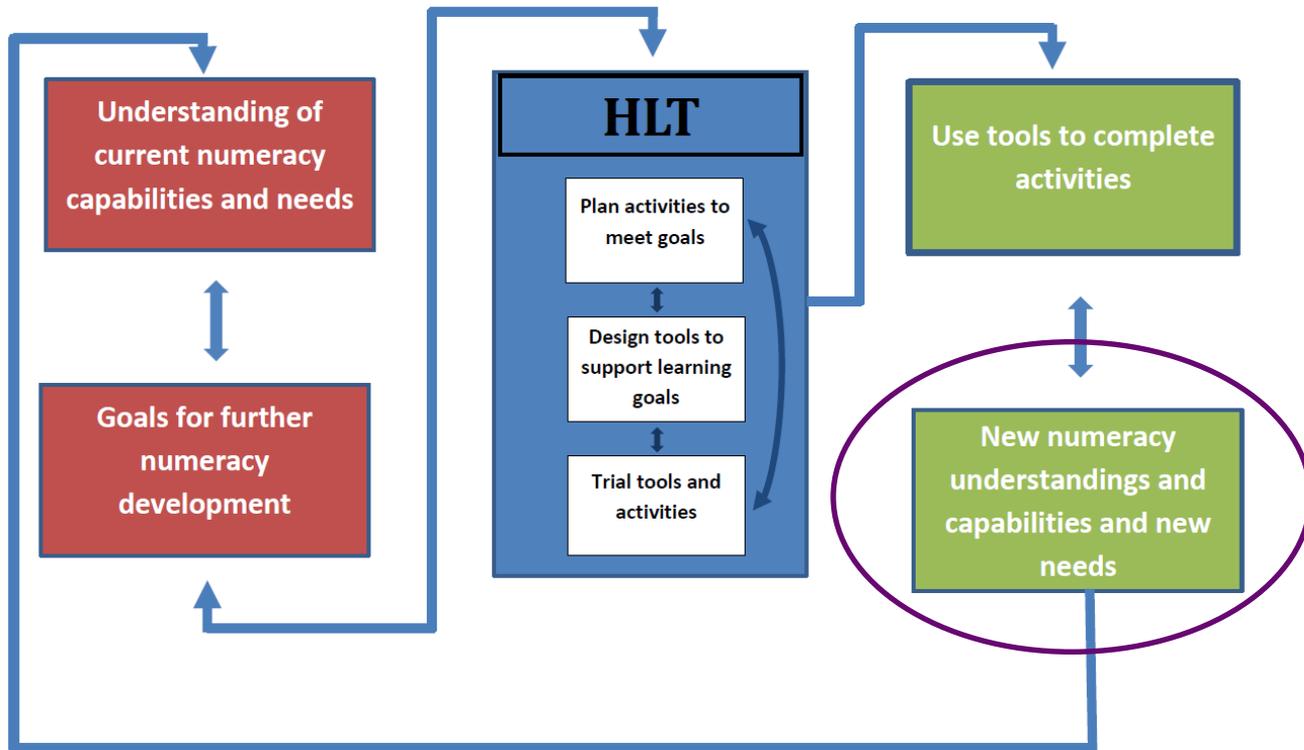
Interactions at the bowling alley

David   [to the third bowler with a score of 57] *we are equal*

Ben   [to David] *but I am on 63*

David   *Yes but I am getting closer, and remember* [pointing to the scoreboard] *that there is a strike* [indicating his strike he had just scored]

David   [On his next turn, scoreboard updated to 75 so David took the lead again] *thank you, thank you* [bowing to his team mates]

Lorraine   *so write your score in*

David   *wait, I want to see what this guy* [Ben] *gets*

Ben   [bowled 1 with first ball]

David   *Ooh, only 1*

Lorraine   *lets see what he does with the next ball* [Ben bowled 3]

David   *oh 3, you* [Ben] *have 67, haha, I am still in front*

Interactions at the bowling alley

Ben [bowled a spare and turned around with hands in the air]

Lorraine *lets see what the score is now, come and write it in Ben* [Ben completed his scoresheet]

Lorraine *And what do you have*

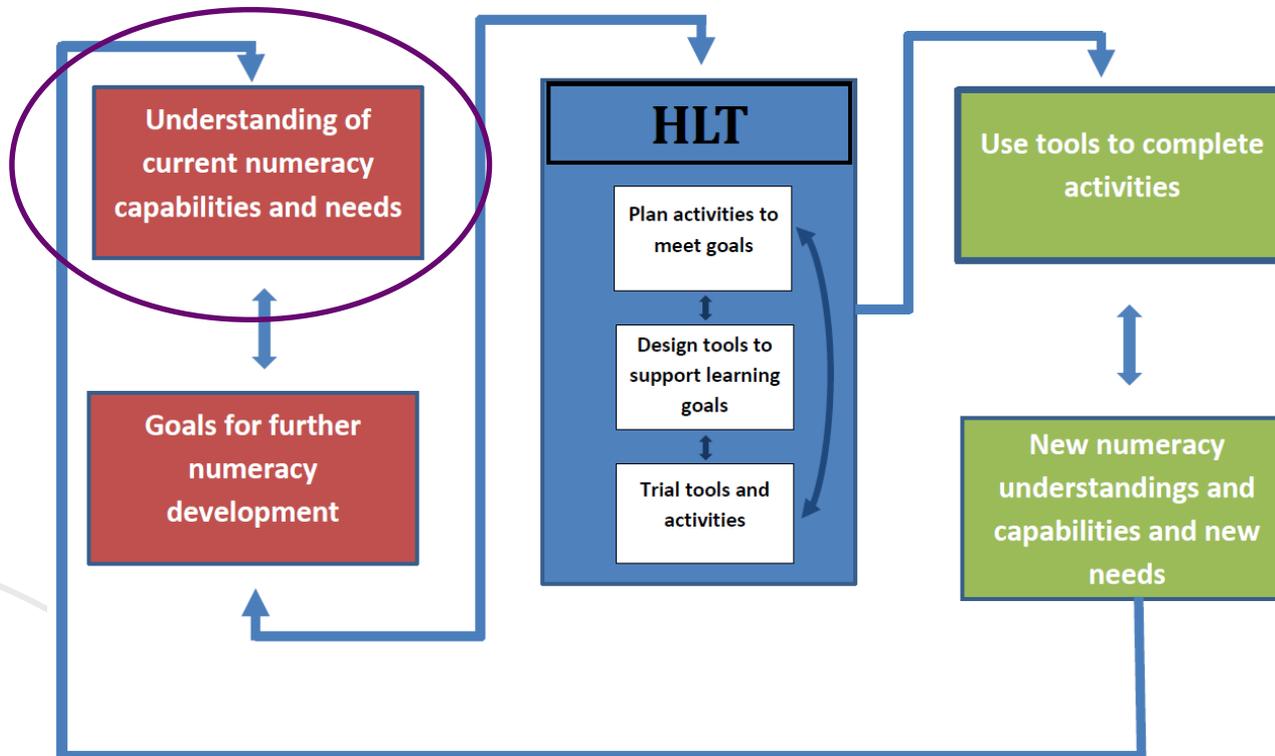**Ben and David Together** *81!*

Lorraine *81? Oh that is close*

David *I have 84, still in front*

Ben *I am back in the game*

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Personalised Numeracy Support Design Cycle

Early conversations

Ben	[bowled 8 and checks scoreboard]
David	[reading Ben's score] *64! Yes, well done!*
Ben	*But I don't know what your score is* [David had bowled two strikes in a row]
David	We'll have to wait 'til it goes up

Ben and David	[after first two frames, scores were level. Ben then scored a spare and David a strike]
Ben	*What's the score?*
David	*I don't know, we will have to wait*

Personalised Numeracy Support Design Cycle
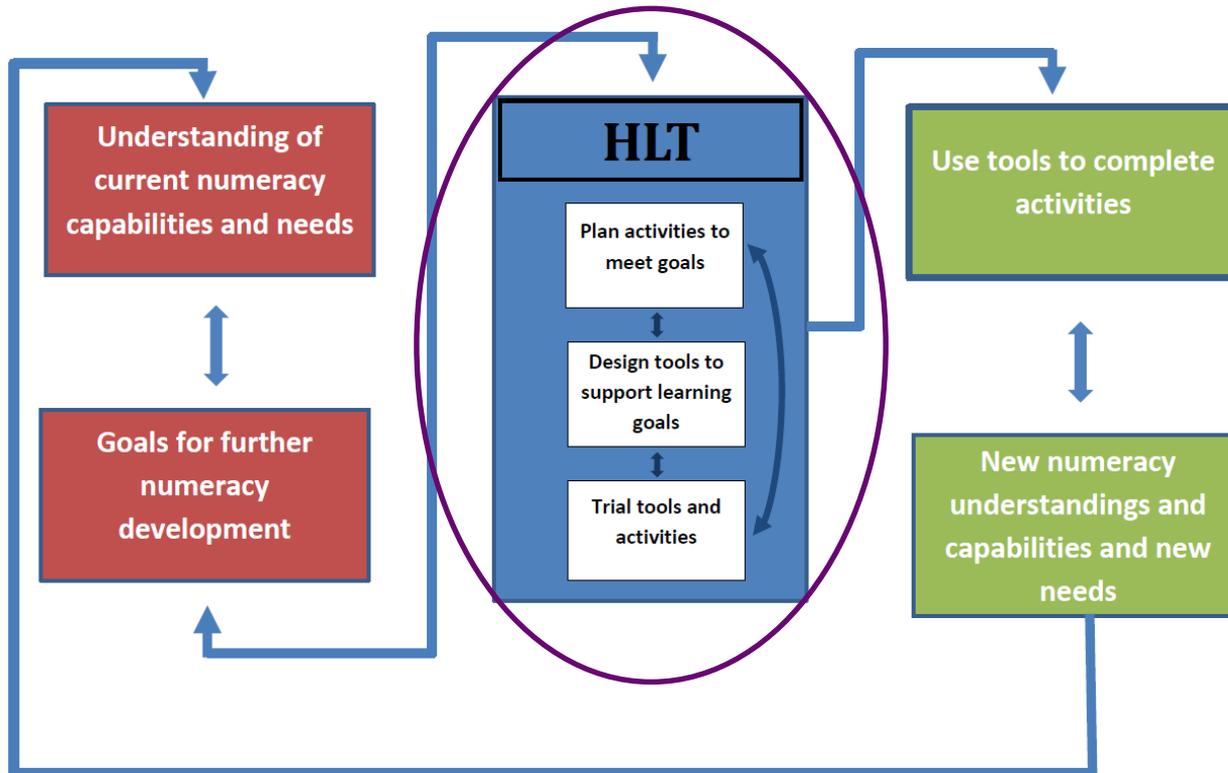
Sequence of skills

1. Determine the score from the previous frame
2. Add ten to this score
3. Record this score
4. At the end of the scoring cycle, record the score for that frame (copy from scoreboard)

Early Scoresheet Designs

Name	Frame 1		Frame 2		Frame 3		Frame 4		Frame 5		Frame 6		Frame 7		Frame 8		Frame 9		Frame 10		Total

Design 3

Design 4

Name	Frame 1		Frame 2		Frame 3		Frame 4		Frame 5		Frame 6		Frame 7		Frame 8		Frame 9		Frame 10		Total

Scoresheet design 4 trial with participants

A section of Ben's scoresheet

The same section of researcher's scoresheet.

Scoresheet design 4 trial with participants

A section of Ben's scoresheet

The same section of researcher's scoresheet.

A section of David's scoresheet

The same section of researcher's scoresheet

Scoresheet design 5

Frame 1	

Frame 2	

Frame 3	

Frame 4	

Frame 5	

Frame 6	

Frame 7	

Frame 8	

Frame 9	

Frame 10	

The first trial of scoresheet (design 5)

Ben's scoresheet

Researcher's scoresheet

Frame 1	
9	-
	9

Frame 2	
6	2
	17

Frame 3	
7	-
	24

Frame 4	
7	/
34	
	41

Frame 5	
7	1
	49

Frame 6	
7	-
	56

Frame 7	
5	-
	61

Frame 8	
5	/
71	
	77

Frame 9	
6	-
	83

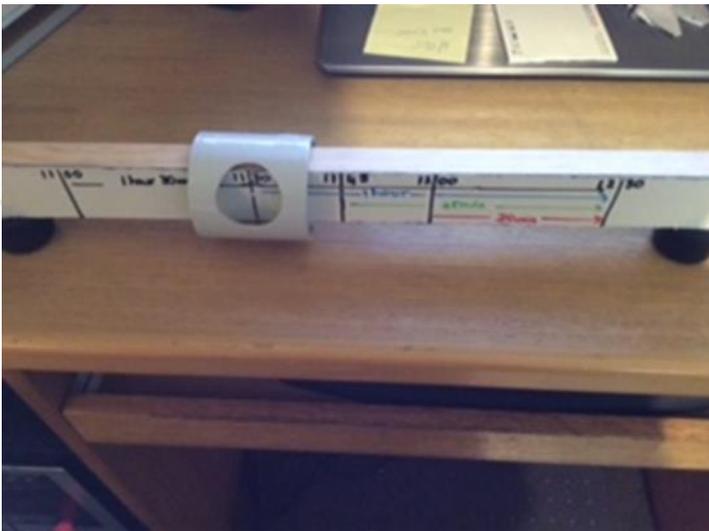| Frame 10	
9/	9
	102

Physical Tools

Representational Tool

Findings:

- Adults with ID use numeracy in various contexts within their everyday activities
- There are opportunities where adults with ID could improve their numeracy in these everyday contexts
- Designing specific tools for different contexts can provide a means to further develop their numeracy

- Frameworks are necessary in supporting this development: numeracy model, disability model.

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