

Presenter notes for Cog Dims and Mul Reps talk

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Dear presenter: Thank you for taking the time to lead the discussion on this draft paper. As the paper is long, we decided that some notes might help you understand what we were trying to achieve: the draft you have was written quickly so this might not be obvious! This “cheat notes” paper is very concise, but you have the huge paper to refer to :) Please don’t hesitate to contact Tim (tim@mcs.vuw.ac.nz) if you have any questions.

1. **We noticed that multiple notations are common in programming environments.**

Examples include:

- Agentsheets: speech and iconic programming language
- Pecan: textual code and Nassi-Shneiderman diagrams
- Leogo: three notations for writing code: text, icons, and direct-manipulation

We wanted to understand how multiple notations were used in programming environments. We discovered that they are used for three fundamental programming activities: reading, writing, and watching.

2. **We extended Norman’s gulfs of execution and evaluation into a multiple notation programming context.**

- Works well for analysing when notations are used for different activity. Example programming environments that use notations for different activities include OpenOffice, AgentSheets, and Logo.
- The extension does not work well when analysing how notations are used for the same activity

3. **Cognitive Dimensions do not tell us how to analyse the interaction between notations.**

- We have done extension of cognitive dimensions to analyse multiple notations.
- CD extension works well when analysing what happens when different notations are used for the same activity. Environments such as Leogo, Mulspren, and Pecan use multiple notations for the same activity.

4. **We have integrated CDs and our framework to produce a multiple notation framework.** The integration lets us analyse notations properly in a multiple notation programming environment.