Using Phone Games to Test ACT-R

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Gamers as Experts

• Expert video game players excel at finding optimal solutions

• Expert video game players excel at compiling productions

• Expert video game players have very fast, consistent perceptual/motor skills

• Expert video game players will work for the glory of achieving the top score
Macro Architectures

- There is often more than one way to get ACT-R to perform a task

- Macro architectures are code templates that organize ACT-R in specific ways for reoccurring task types

- Organized in advance of experience

- Designed for real world
SGOMS

• GOMS is a Macro architecture for routine expertise

• Default system for coding real world expertise

• Instantiated as a set of generic productions to manage
  • Operators, methods, unit tasks, planning units

• Serial bottleneck - generic productions add time over task specific productions
Instructions

The prompts appearing in sequence. Your job is to learn which order the prompts come in, so you know the correct sequence of responses. You can start the Unit Task Training now. In this game there are three unit tasks. Some unit tasks have branching orders and which branch you are given is random. However, the different branches within a unit task are individually consistent.

RP unit task:
\[
\text{rp - su - zb - wm - fp}
\]

HW unit task:
\[
\text{hw - yp - zb - f} \quad \text{su - j}
\]

AK unit task:
\[
\text{Ak - wm - su - zb - f}
\]

Score: 42

Finish Game

End Game
Human and Model Results

- unknown mid ut
- Known mid ut
- unkown pu-o start
- known pu-o mid
- known pu-s mid
- known first ut
- unknown first ut
- unkown pu-s start

Legend:
- FK
- NN
- SGOMS
- Optimal
Human and Model Results

- unknown mid ut
- Known mid ut
- unkown pu-o start
- known pu-o mid
- known pu-s mid
- known first ut
- unknown first ut
- unkown pu-s start

Legend:
- FK
- NN
- SGOMS
- Optimal
Human and Model Results

Future
• Real-time data collection using data (works! ethics!?!)

• Leaderboard (coming soon)

• Research questions
  • Hick's law
  • Buffer capacity
  • Interruptions