

Guy Hoffman - Fall 2003

A Reading of
B. Gleissner, A. Meltzoff and H. Bekkering's
**Children's Coding of Human Action:
Cognitive Factors Influencing Imitation in 3 Year Olds**

Imitation of intra-body motions are used in this study to infer how children of age 3 code human action. There is an inherent circularity in this research as it tries to prove simultaneously that imitation is a good tool to measure coding, and that the specific results from imitation studies indicate a specific coding. Apart from that methodological flaw, I find that the basic reasoning presented herein sound. It seems that the particular experiment does tell us a lot about how actions are encoded, and I agree with the claim that imitation is active reproduction of an action and that it therefore goes through the mental coding of the action involved.

In the particular study described, four factors were cross-examined in an attempt to learn about the mental coding of reaching and touching body parts. These were: visibility of the body part (ear vs. knee), whether the part was actually touched (interpreted as goal vs. motion-centric action), the number of hands involved in the action and whether the body midline was crossed to accomplish the action.

Of particular interest to the scientists was the significance of the actual touching of the body part as opposed to just gesturing towards it. When the body part was actually touched, the child was more likely to use the closest hand to that part to perform the action rather than using the "correct" hand. When the ear or knee were not touched, this error was far less likely.

This led the authors to the conclusion that when a body part was actually touched, this action was encoded as a goal-oriented action and the less significant part in the encoding was how that goal was achieved.

More generally, it seems that this study makes a very strong point towards hierarchical, goal-oriented encoding of action, even in children as young as 36 months old. It also weakens a previous assumption that contralateral action was somehow neurologically weaker than ipsilateral action, as this bias was not observed when the motion was not goal-oriented. All of these are good evidence towards the author's conclusion.

Looking at machines then, a goal-based action detection system should prove valuable in

trying to extract meaning and intent from collaborating humans. A prerequisite then is a good object-of-attention detection mechanism that will put the current action in a goal-oriented framework.

Diverging from the specific data presented in this research, though, I do not believe that intra-body awareness is a good goal to start with, even if it develops earlier in infants than external shared objects of attention. External joint-attention objects might prove to be an easier first goal because it eliminates the need for a good visual-to-proprioceptive mapping.