The effects of local stimulus enhancement and object affordances on an imitation task: an eye tracking study.

Lauren Dillon and Victoria Lovett

Department of Psychology, Swansea University, UK

The Research Question

Can pseudo-imitative mechanisms, specifically local stimulus enhancement and object affordances, effect target action production on an infant imitation study? And can differences be found in gaze behaviour whilst watching these demonstrations?

Method

Participants: Forty 6-month-old infants (23 males), mean age 199 days old participated in the study. Participants were recruited from Swansea and the local area. All participants received £10 towards their travel costs and a Baby Scientist Certificate.

Design - A between subjects design was employed with four conditions (See Figure 1):

A. *Imitation* – modelling the target action of mitten removal
B. *Control* – puppet present and shaken from side to side
C. *Local stimulus enhancement (LSE)* – experimenter pointing at the mitten
D. *Object affordance (OA)* – mitten removal from the puppet without experimenter interaction

Method. Infants watched a video demonstration whilst gaze behaviour was recorded. Infants then took part in an immediate behavioural recall test using the same puppet stimulus viewed on the video.

Results

Infants in the imitation, OA and LSE conditions were more likely to produce the target action of mitten removal than infants in the control condition. No significant differences in target action production were found across the three experimental conditions.

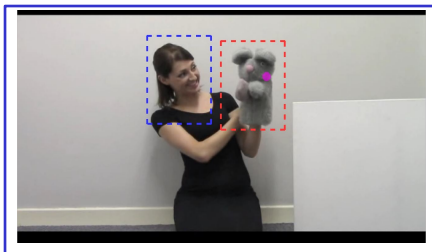

Figure 2. Defined Areas of Interest (AOIs) shown on a still of the Object Affordance condition.

Puppet shown in red
Experimenter in blue.

Table 1. Gaze Behaviour: the percentage of time fixated on areas of interest (AOIs) in each condition.

	Percentage of Time looking at AOI	
	Puppet	Experimenter Face
Control	16	25
Imitation	19	17
Local stimulus enhancement	23	21
Object affordance	18	16

The Previous Literature

Barr et al.(1996) demonstrated that 6-month-old infants can imitate using a puppet/mitten imitation task, where mitten removal was the target action. However, Horne et al. (2009) suggested that there are many differences between the imitation and control conditions in Barr et al's study that did not control for pseudo-imitative mechanisms (such as LSE and OA). Horne et al., added two conditions to measure the effects of LSE and OA and found that infants removed the mitten in the LSE and OA conditions just as often as in the imitation condition. This suggests that these pseudo-imitative mechanisms can play a role in imitation tasks.

A further study (Taylor & Herbet, 2014) replicated Barr et al. (1996) but incorporated eye-tracking to investigate where infants gaze during the video. However, this research failed to incorporate controls for any pseudo-imitative mechanisms.

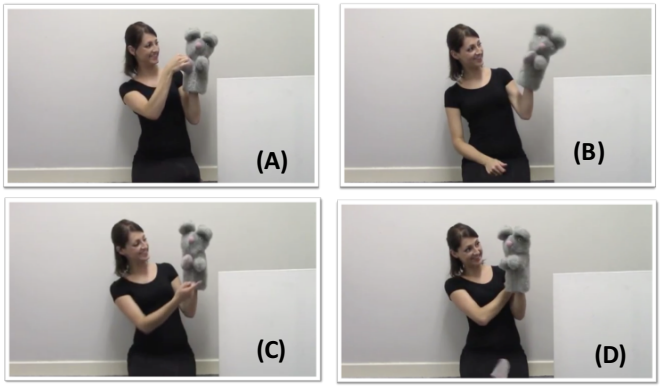

Figure 1. Stills from the four videos (A) Imitation condition, (B) Control condition (C) Local stimulus enhancement condition and (D) Object affordance condition

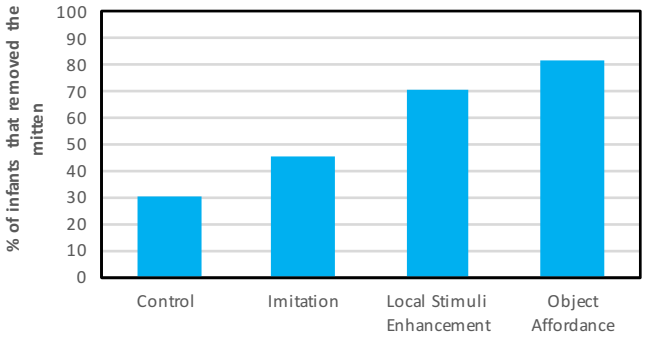

Figure 3. Percentage of infants that removed the mitten in each condition

Conclusions

LSE and OA demonstrations can cause infants to produce the target action on an imitation task even when these demonstrations occur via video. Gaze behaviour was similar in all experimental conditions implying that these pseudo-imitative mechanisms direct attention in the same way as an imitation task. The results add to the growing body of literature on imitation, and suggest that infants as young as 6-months-old can learn from video demonstrations.

References

Barr, R., Dowden, A., & Hayne, H. (1996). Developmental changes in deferred imitation by 6- to 24-months-old infants. *Infant Behavior and Development, 19*, 159–170.

Horne, P.J., Erjavec, M., & Lovett, V.E. (2009). The effects of modelling, local stimulus enhancement, and affordance demonstration on the production of object-directed actions in 6-month-old infants. *British Journal of Developmental Psychology, 27*(2), 269-281.

Taylor, G., & Herbert, J.S. (2014). Infant and adult visual attention during an imitation demonstration. *Developmental Psychobiology, 56*(4), 770-782.

To download a copy of the poster please follow the link:
http://playlabswansea.org/bps-conference...ion-april-2016/
or scan the QR code:

The British Psychological Society
Promoting excellence in psychology