Teaching infants

Effect of teacher familiarity and teaching in real life

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Poster presented at the XIX Biennial International Conference on Infant Studies, Berlin, July 3-5 2014

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Imitation research: Infants are sensitive to being taught

Infants are more likely to imitate novel actions when receiving ostensive and referential signals.

- Newborns imitate facial gestures[1,2]
- 13-month-olds imitate inefficient, non-goal directed actions[3]
- 14-month-olds imitate unusual actions after a 1-week delay[4]
- 14-month-olds selectively imitate unusual actions[5], *if the action is demonstrated with ostensive and referential signals*[6]
- 3- and 5-year-olds imitate both causally necessary and irrelevant steps in an action sequence and interpret them as normative[7]

Theory of Natural Pedagogy[8,9,10]

Imitation supports learning of cognitively 'opaque' information (e.g. cultural practices).

Imitation is facilitated by teaching: knowledge demonstrations with ostensive, referential cues (e.g. eye contact, pointing).

RQ: Do 'pedagogical signals' need to be presented for every demonstration of a novel action or do children take and maintain a 'pedagogical stance'?

Study I: Do we have to teach all the time?

Method

Participants
44 18-month-old infants

Design
Model familiarity: familiar model vs. stranger model

Pedagogical communication: with signals vs. without signals

Baseline: familiar model, with pedagogical signals

Procedure
1. Warm up with Experimenter 1
(free play with pedagogical communication)

2. Four different test trials
   a) with either the familiar experimenter (E1) or a 'stranger' (E2)
   b) with pedagogical signals before and during action demonstration or without signals:
   e.g., eye contact, "Watch this, [name]!", pointing vs. no talking, no eye contact, no pointing

Results

Baseline. Imitation on 9% of trials in baseline and on 44% of trials in experimental conditions ($p<.05$)

Communication. Infants were more likely to imitate after a signalled demonstration than after a non-signalled demonstration.

Model familiarity. Infants were more likely to imitate a familiar model than a stranger model.

	Familiar model	Stranger model	Total
With signals	66.7%	46.9%	57.4%
Without signals	40.0%	23.1%	32.0%
Total	52.6%	34.3%	44.0%

Table: Imitation rates broken down by model familiarity and pedagogical communication in average per cent of trials. Significant differences between communication conditions ($p<.01$ total, $p<.05$ familiar/ stranger) and familiarity conditions ($p<.05$ total/ with/ without signals)

Discussion

Communication facilitates imitation in infants.

However, when investigating how often children copy a novel action, children perform the novel action many times, irrespective of pedagogical communication during action observation.

Furthermore, infants are more likely to imitate a familiar person than a stranger.

Results of imitation studies are likely influenced by the familiarity of the participant with the experimenter (e.g. through warm-up).

How does imitation develop with age?
Do parents actually teach their children as described by natural pedagogy?

Theory and reality: Imitation is not so simple

While the authors claim that natural pedagogy[8,9,10] is human specific and do not give age specifications for the applicability of their theory, most work has been conducted with children up to age 2 years. BUT:

- 14-month-olds rarely imitate novel, 'unsuccessful' actions[6,11] and they selectively imitate only the efficient actions if presented with more than one means to achieve a goal[12]
- 14-month-olds are less likely to imitate actions which are physically difficult for them[13]
- 18-month-olds are less likely to imitate unusual actions if they know of alternative means to achieve the goal[14]
- 3-year-olds imitate intentional actions without pedagogical signals[15]
- 4- and 5-year-olds are more likely to imitate a reliable model than an unreliable model[16]

Finally, most of this research has been done in a laboratory setting with experimenters. But do parents actually use ostensive signals to pass on action knowledge? And, if they do, does this ostensive cueing also lead to increased imitation in their children in a naturalistic setting?

According to the theory of natural pedagogy[8,9,10] people are naturally motivated to teach and learn from their conspecifics.

RQ: Do parents demonstrate actions for their children and do parents use pedagogical communication for their demonstrations? Do children imitate their parents after teaching?

Study II: Do parents actually teach their children?

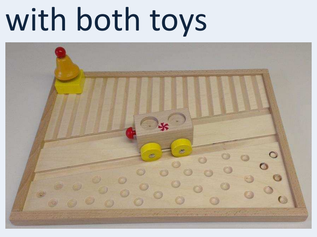
Method

Participants. 10 18-month-olds and 4-year-olds

Materials. 2 novel toys with multiple hidden features

Procedure.

1. Parent watches 2 videos: action demonstration on toy A, no action on toy B (counterbalanced)
2. Parent (P) and child (C) play freely for 10 min. with both toys



Results example

Participant 1: 18 months		
Exploring together with pedagogy	P: point → car front, "What can it do?" P: moves C's hand to ring bell P: "Look here", [action] P: "Can you do it?", [action] –repeatedly-	C: grabs car and bell C: [action with hand] C: gaze away C: [exploration],[imitation]

Participant 2: 4 years		**Participant 3: 4 years**	
Pedagogy successful	P: "Look here, what this is" P: [action], gaze → C C: [imitation]	Pedagogy successful, then P explores	P: "Pay attention. If you…" [action] C: [imitation] P: takes toy, performs same action from different angle C: -distracted-, [imitates 1st action]
Pedagogy failed	C: [plays with function 1] P: "Look here", [action] C: [plays with function 1]		
Exploring together	P: [action 1], gaze → C C: [imitation 1], [explore] P: -verbal description 2- C: [action 2]		

Discussion

Sometimes, parents use pedagogical signals to teach their children. Then, children might imitate their parents.

But often times parents direct their child's attention and then 'leave them space' to detect the toy's function themselves. The actions are then together developed further.

Parents seem to direct and guide younger children more than older children

References

1 Meltzoff & Moore (1977). Imitation of facial and manual gestures by human neonates
2 Meltzoff & Moore (1983). Newborn infants imitate adult facial gestures
3 Sakkalou, et al. (2013). Infants show stability of goal-directed imitation
4 Meltzoff (1988). Infant imitation after a 1-week delay
5 Gergely, Bekkering, & Király (2002). Rational imitation in preverbal infants
6 Király, Csibra, & Gergely (2013). Beyond rational imitation
7 Keupp, Behne, & Rakoczy (2013). Why do children overimitate? Normativity is crucial
8 Csibra & Gergely (2006). Social learning and social cognition: The case for pedagogy
9 Csibra & Gergely (2009). Natural pedagogy
10 Csibra & Gergely (2011). Natural pedagogy as evolutionary adaptation
11 Paulus, Hunnius, Vissers, & Bekkering (2011a). Bridging the gap between the other and me
12 Gergely & Csibra (2005). The social construction of the cultural mind
13 Paulus, Hunnius, Vissers, & Bekkering (2011b). Imitation in infancy: Rational or motor resonance?
14 Pinkham & Jaswal (2011). Watch and learn? Infants privilege efficiency over pedagogy during imitative learning
15 Schmidt, Rakoczy, & Tomasello (2011). Young children attribute normativity to novel actions without pedagogy or normative language
16 Rakoczy, Warneken, & Tomasello (2009). Young children's selective learning of rule games from reliable and unreliable models

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This work was supported by an EPS Small Grant to the last author, the Marie-Curie Initial Training Network, „TESIS: Towards an Embodied Science of InterSubjectivity" (FP7-PEOPLE-2010-ITN, 264828), HABA and LEGO.