The role of adult's intention in overimitation effect.

Kotova T., Preobrajenskaya A.,
Russian State University for the Humanities

Research of preschoolers' imitation can inform us about their thinking and their representation of adult's mind and causes for behavior. One of the recent papers on this theme (Lyons et al., 2007) was devoted to the off-centre aspect of the imitation process. The authors noticed that children often imitate not only effective adult's activities (what is an understandable reaction), but inefficient actions too. It could be explained by their inability to distinguish effective and ineffective actions, but Lyons et al. (2007) demonstrated that when children hadn't seen adult's example, they didn't accomplish inefficient actions with the same object. Lyons et al. called this phenomenon overimitation effect.

They supposed that its mechanism is object's causal structure distortion in child's representation.

In order to prove this suggestion, the authors demonstrated that social factors didn't influence this effect. Children overimitated adult's actions even when an adult had said that his actions were "silly" and redundant. Moreover, they did it even when the experimenter pretended to be in a hurry and asked the child to check if his assistant had put the toy back into the object. Authors tried to remove adult's authority: they removed from the situation all the features revealing that an experimenter wanted a child to reproduce his operations.

But social factors extend further, we think. Piaget said that a scheme of an object doesn't consist of pure knowledge as if it were a copy of an object, but it consists of actions. It may be assumed that the difference between knowledge and action consists in the existence of a goal. Action goals can be observed through the indicators of agent's intention. We also suppose that the intention can be considered as a social factor under condition when one watches another manipulating with an object.

For example when L.Vygotsky wrote about social influence on learning, he didn't mean direct influence aimed at inducing imitation, and even not only a relationship between an adult and a child (like adult's authority and child's submission), but indirect aspects of their cooperation too (like using each other as a tool, joint goals, etc).

So we hypothesized that the mechanism of the overimitation effect is an attribution of a pedagogical intention to adult's actions. To verify this suggestion we decided to amplify a pedagogical intention on the one hand and to provoke the attribution any other intention (for example, exploratory) on the other hand.

Method.

Subjects: Thirty children (12 girls and 18 boys) from the municipal kindergartens participated in the study. The mean age was 4,4 years (ranging from 3 to 6 years).

Procedure: This procedure was a modified version of a task used by Lyons et al. (2007). Children were presented with a novel object

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Insert fig.1 here

Similar to their procedure ours comprised relevant and irrelevant actions. The experimenter pulled out two sticks one after another (1, 2), then unscrewed a small cover (3), then lifted up a plastic hood (4), and then took out a toy. Only an action with a plastic hood (4) was necessary for reaching the toy, other actions were irrelevant (1-3).

After bringing the object into the room, the experimenter sat down next to a child (so that both had the same view of the object).

There were two conditions in our experiment: pedagogical intention and exploratory intention.

Pedagogical intention: 16 children watched an experimenter executing all actions (irrelevant and relevant) in such a manner as if she were going to instruct them how to deal with this object. It means that she:

- denoted the object ("Look at this! This is Magic Cage".)
- indicated future result of his actions ("If you do these actions, you get the toy".)
- execute actions in a confidential manner (slight pauses, stable speed of execution)
- commented his execution in the upshot of each action ("So.").

Exploratory intention: 14 children watched the experimenter executing all actions (irrelevant and relevant) in such a manner as if she didn't know this object and was going to gain an understanding of it. The subject was in a role of an eye-witness only. It means that the experimenter

- couldn't denote the object ("Look! What a strange thing!")
- indicated his interest in the structure of the object ("Let's look into it!")
- executed actions in hesitating manner (substantial pauses, irregular speed of execution)
- commented his execution of each action ("Hm. And what's about this?").

In the end (under both conditions) the experimenter showed the toy and assembled the object in the reverse order. Afterwards she said that she had to leave the room to check on something, telling the child: ‘‘If you want to, you can get the toy while I’m gone. You can get it out however you want.’’

The experimenter returned to the room when child reached the toy. Test trial videotapes were analyzed to determine how frequently participants overimitated the experimenter’s irrelevant actions in different conditions.

Results and discussion.

We scored the amount of irrelevant actions for each child from each group. This amount ranged from 0 to 3. The amount of irrelevant actions in the «pedagogical» group was significantly bigger than in the «exploratory» group, U Mann-Whitney = 56.5, $p<0.01$. Children who watched experimenter’s actions with pedagogical intention overimitated, as a rule, all the irrelevant actions. Children under the exploratory intention condition either didn't imitate irrelevant actions, or imitated only the last one - unscrewing the small cover (See Table 1). We supposed that this action was the most similar to the relevant one, because the plastic hood was opaque and a child couldn't see possible contact between the hood and other parts of the object.

Furthermore children from the "pedagogical intention" group behaved as if they were under observation or waited for estimation: after the completion they looked around or looked at the door. Participants from another group played with the toy more often.

Table №1: Amount of irrelevant actions in different groups.

Group	Average number of irrelevant actions (arranged between 0 and 3) M	Mode of irrelevant actions (Mo)	Part of subjects (%) who executed			
			None irrelevant actions	One irrelevant action	Two irrelevant actions	Three irrelevant actions
Pedagogical intention	2.61	3	5.6	0	11.1	83.3
Exploratory intention	1.63	1	0	57.1	21.4	21.4

We can see that the overimitation effect depends heavily on adult's intention. It helps us to understand the mechanism of this effect. Since the children from "pedagogical intention" group overimitated like participants of Lyons et al. (2007) when they dealt with a novel object, and the children from "exploratory intention" group generally didn't overimitate like those who dealt with familiar object, we can infer that children are disposed to attribute the pedagogical intention to adults showing them a novel object. It means that causal distortion, supposed in Lyons et al. (2007) has an understandable reason, and this reason is a social one!

But of course there is a difference between social factors, discussed and declined in Lyons et al. (2007) and a social factor hypothesized in our experiment. Attributed intention is not an adult's authority. Intention is included in the child's representation of a problem. To put it more precisely, it is supposedly included in the causal structure of a novel object.

We suppose that that such a feature of children's thinking may be a reason for their "strange" behaviour during solution of Piagetian problems. The ground for the suggestion is a series of research projects devoted to accentuation of social factors in Piagetian problems: adult's wording (Light, 1988) emotional context (Donaldson, 1978), "social role" of contractor (J.McGarrigal, cited by Donaldson, 1978). These explanations are different and uncoordinated. But all of the results can be explained by our suggestion: the causal scheme of an object isn't unified, objective, consistent knowledge for a child. It varies depending on adult’s intention related to an object.

References.

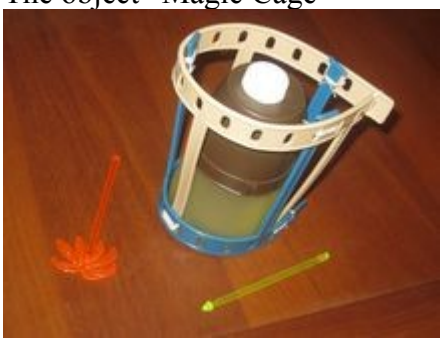
Lyons, D.E., Young, A.G., & Keil, F.C. (2007). The Hidden Structure of Overimitation. *Proceedings of the National Academy of Sciences, 104,* 19751-19756

Donaldson, M. (1978) Child’s minds. – Glasgo: Fontana

Light, P. (1988) Context, conservation and conversation. K. Richardson & S.Sheldon (Eds.) Cognitive development in adolescence. – Hove: LEA

Fig.1

The object “Magic Cage”



Actions 1-2 (irrelevant)

Action 3 (irrelevant)

Action 4 (relevant)