

Role of functional and categorial relations in conceptual organisation during development

Sandrine PERRAUDIN¹ & Pierre MOUNOUD

Faculty of Psychology and Educational Sciences, University of Geneva, Geneva, Switzerland

¹sandrine.perraudin@pse.unige.ch

1. Introduction

Conceptual development has generally been studied with "matching to sample paradigms" (Osborne & Calhoun, 1998; Waxman & Namy, 1997) involving an intentional retrieval of the relations existing among objects and hence evaluating the explicit level of information processing. The novelty of our approach is to use a priming paradigm with a naming task in order to evaluate, at an implicit or automatic level of information processing, the prevalence of **functional or categorial (taxonomic) relations** among **manufactured objects in children aged 5, 7 and 9 years** and in **young adults**. For the **functional relations**, primes are **objects which can be used to perform an action** on the targets (e.g. a knife "to cut" bread, a key "to start" the car). For the **categorial ones** we use primes and target objects from the **same superordinate category** (e.g. cake and bread, motorcycle and car) **sharing a same function** (e.g. to feed, to carry).

2. Hypotheses

Young children usually define objects, and in particular manufactured objects, by their functional meaning in reference to the actions performed on them. Therefore **functional relations would be at the origin of conceptual organisation. Their importance at an automatic processing level will be stronger than for the categorial ones at the beginning of the five- to seven-year shift** (Sameroff & Haith, 1996). Thereafter their importance will decrease and progressively become equivalent to that of the categorial ones.

3. Method

1. Population

- 48 children aged 5 (N=16, mean=5.3), 7 (N= 16, mean=7.3) and 9 (N= 16, mean=9.2) years
- 22 young adults (mean=23 years)

2. Procedure

We use a **priming paradigm** with pictures as stimuli. Three types of relations (Relation factor) between primes and targets are manipulated.

Each pair of prime-target is presented 5 times (Repetition factor).

Figure 1: Conditions

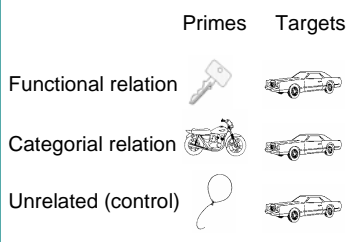
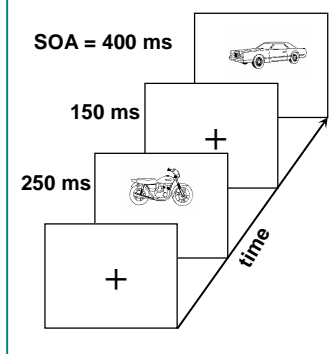


Figure 2: Unfolding of a trial

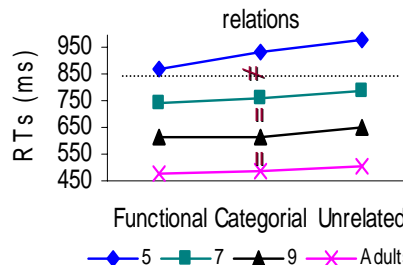


Task : To look at the primes and to **name the targets as quickly as possible.**

We measure reaction times (RTs) to name the targets.

4. Results

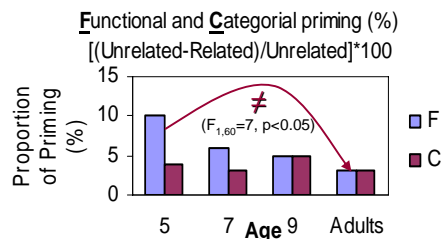
Means of RTs for each age and each type of relations



- For all groups: no interaction between Repetition and Relation

➤ **5-year old children:** RTs in functional condition are lower than RTs in unrelated condition ($F_{1,30}=107, p<0.05$), but the difference in RTs between categorial and unrelated conditions only approaches significance ($F_{1,30}=49, p=0.065$).

➤ **7-, 9-year old children and adults:** RTs in functional and categorial conditions are similar and lower than RTs in unrelated condition ($F_{1,30}=46, p<0.01, F_{1,30}=32, p<0.05, F_{1,30}=35, p<0.01, F_{1,30}=34, p<0.01, F_{1,42}=30, p<0.01, F_{1,42}=20, p<0.01$).



Functional priming for 5-year old children is greater than for adults.

5. Discussion

Contrary to the studies using a "matching to sample paradigm" (explicit processing), which show no preference for functional or categorial relations, our study shows that at an automatic level of processing the strength of functional relations is stronger than that of the categorial ones at 5 years of age. Moreover, the importance of functional relations is greater for the 5-year old children than for the adults. The relative importance of functional relations become equivalent to that of the categorial ones at 7 and 9 years of age and in adults. However, since we have used a naming task, our results could be mainly due to lexical instead of conceptual or semantic relations. In order to clarify this problem we are presently analysing the results of another experiment using a categorial decision task instead of the naming one (Perraudin & Mounoud, 2003).

References

- Osborne, J. G., & Calhoun, D. O. (1998). Themes, taxons, and trial types in children's matching to sample: Methodological considerations. *Journal of Experimental Child Psychology*, 68(1), 36-51.
- Perraudin, S. & Mounoud, P. (October 2003). *The contribution of priming paradigm in the understanding of the conceptual developmental shift from 5 to 9 years old*. Poster communication, Berne, Switzerland.
- Sameroff, A.J., & Haith, M.M. (1996). *The five to seven year shift: The Age of Reason and Responsibility*. The University of Chicago press, Chicago and London.
- Waxman, S. R., & Namy, L. L. (1997). Challenging the notion of a thematic preference in young children. *Developmental Psychology* 33(3), 556-567.