The contribution of priming paradigm in the understanding of the conceptual developmental shift from 5 to 9 years of age

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INTRODUCTION

We used **priming paradigms** to study the weight of **functional** (e.g. key-car, knife-bread) and **taxonomic relations** (e.g. motorbike-car, cake-bread), at an **automatic level of processing**, in the **semantic (conceptual) organisation** of 5-, 7- and 9-year old children and of young adults. A first study (Perraudin & Mounoud, 2003) was conducted by means of a **primed naming task** with pictures as stimuli, in which primes and targets shared a functional relation, a taxonomic relation or no relation. Since our aim was to study the semantic systems rather than the lexical ones, we conducted a second study with a **primed categorical decision task** (same stimuli as in the first study) in order to control the influence of lexical-level processes on the priming effects observed with the naming task. Moreover, we added in the second study a neutral condition in which the prime evokes little or no meaning in order to distinguish facilitation, induced by the semantic relation between primes and targets, from inhibition induced by a prime unrelated to the target.

HYPOTHESES

➢ **Functional relations** would be at the **origin of semantic development** and would hence play a **more important role than taxonomic relations a the beginning of the 5- to 7-year shift** (Sameroff & Haith, 1996).

➢ Since functional and taxonomic conditions involved pictures of objects sharing a **strong semantic relation**, but a **weak verbal associative strength** (cf. Ferrand & Alario, 1998), **priming effects** (relative to the unrelated condition) **should be essentially semantic in nature** (de Mornay Davies, 1998). Hence, no difference in priming effects are expected between our tasks (naming vs categorical decision).

➢ We assumed that we investigated the semantic systems at an **automatic level of processing**. Therefore, we expect to observe **only facilitation** (e.g. no difference between the neutral and unrelated conditions in the categorical decision task).

METHODS

1. Tasks and Population

Primed Naming Task

« Name the target as quickly as possible »

- 22 young adults, 48 children aged 5, 7 and 9 years
- 3 **Conditions**: **F**unctional, **T**axonomic and **UnR**elated

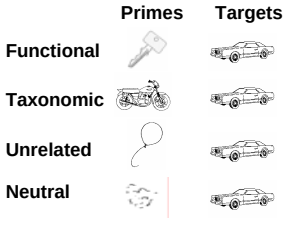
Primed Categorical Decision Task

« Decide as quickly as possible if the target is a clothing or not »

- 22 young adults, 51 children aged 5, 7 and 9 years
- 4 **Conditions**: **F**unctional, **T**axonomic, **UnR**elated, **N**eutral

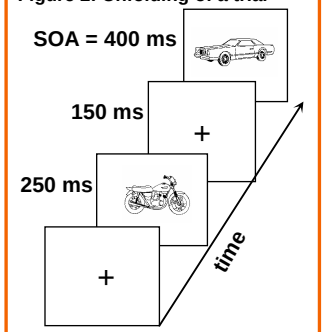
2. Procedure

Figure 1: Conditions



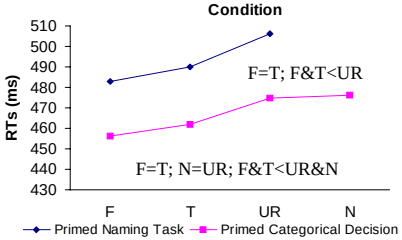
Each pair of prime-target was presented 4 or 5 times (**Repetition**)

Figure 2: Unfolding of a trial



RESULTS

Means of RTs for adults according to each Condition



For the 2 tasks:

- Condition: sign. $F'(2.3,10.6)=4$, $p<0.05$ / $F'(3.5,17.2)=5$, $p<0.05$
- Repetition: sign. $F'(5.4,29.6)=6$, $p<0.05$ / $F'(4.6,65.3)=5$, $p<0.05$
- Condition*Repetition: n.s.

→ **Equal Functional and Taxonomic priming**

Only significant differences for the Condition factor are mentionned

5-year old children
- Naming Task: F<T&UR
- Categorical Decision Task: F<N&UR

→ **Only Functional priming**

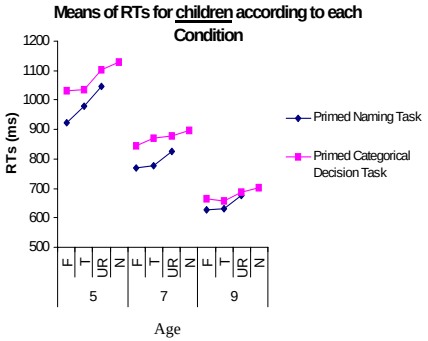
7-year old children
- Naming Task: F&T<NR
- Categorical Decision Task: n.s.

→ **Equal Functional and Taxonomic priming, but only for the naming task**

9-year old children
- Naming Task: F&T<NR
- Categorical Decision Task: F&T<N&UR

→ **Equal Functional and Taxonomic priming**

Means of RTs for children according to each Condition



CONCLUSION

➢ The results of the two studies show that **functional relations** play the **most important role in the semantic organisation of the 5-year old children**. Thereafter, at 9 years of age and in adults, their importance becomes equivalent to that of the taxonomic ones.

➢ Moreover, **the pattern of priming effects was not influenced by the task used, except for the 7-year old children**. Only the naming task produced priming effects for these children. The disappearance of the priming effects in the categorical decision task could be explained by the 5- to 7-year shift relative to cognitive changes and in particular in the semantic knowledge, whereas lexical levels do not seem to be affected by this shift.

➢ Finally, the similarity of RTs between the unrelated and neutral conditions in the primed categorical decision task for all groups indicates that **the priming effects observed are only due to facilitation.**

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