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# Modalities of social interaction and the elaboration of cognition

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## ABSTRACT

This poster examines three factors which we hypothesize as playing a constitutive role in the construction of cognitive skills in testing and didactic interactions: 1) the *object of discourse* of the social interaction, 2) the *institutional context* in which didactic and testing interactions take place, and 3) the assumed or perceived *role of the adult*. Empirical illustrations are presented from a series of studies whose aim is to explore the functioning and intrication of these factors. Our results indicate that there exists an interdependence between children's assessed competence and the context in which it is displayed, suggesting that the social role and status of adult interlocutor as well as the institutional context and its representational systems impact the child's perceptions of the interaction and hence the elaboration of responses in these contexts.

## Introduction

We consider testing and teaching episodes as essentially interactive situations in which the questions asked and the answers given are linked to the dimensions of the social interaction. Consequently, the understanding of how a child comes to construct a response to a cognitive problem posed by the tester or teacher demands the consideration of not only the attributes of this problem (its logical structure, for example) or that of the child (his/her cognitive level, for example) but also the characteristics of the context in which the interaction takes place. In this perspective, a testing or didactic interaction can be regarded as a social event whereby participants enter the situation with a set of expectations of roles and definitions of the situation. Adult-child communication in these situations is regulated according to these expectations and a mutual understanding is attained by the construction of a common intersubjectivity. This poster presents a series of studies which have analyzed testing and didactic situations with the aim of gaining a better understanding of the interdigitation of cognitive and social processes involved in the development of cognitive skills.

# 1. The object of discourse

In any testing and didactic situation, interlocutors not only have to relate to each other but also to the object of knowledge about which they interact and which becomes the object of discourse (i.e., the knowledge to be transmitted in the didactic interactions or to be assessed in testing situations). A condition of successful communication is the construction and maintenance of an *intersubjectivity* in regards to the conceptual referential framework. However, in reason of their differing social status and roles and perspectives, we could hypothesize that the adult and the child may not automatically centre their perceptions on the same aspects of the situation. This may be especially likely in testing episodes where the object of discourse is unknown to the child (for instance, Piagetian tests).

## Research questions

- How do children define the definition of a testing situation, its experimental material and the object of discourse and how does these definitions affect the construction of a response in this context?
- How do children come to understand the adult's expectations?
- What are the processes of modification and reconstruction of the object of discourse observed in testing situations?

**procedure:** Two qualitative methods were used to explore the construction of the object of discourse in the Piagetian conservation of liquids task as well as children's representations of this object:

1) *post-experimental interviews*: 35 5-6 year olds attending kindergarten in Geneva, Switzerland were administered the conservation of liquids test. Immediately afterwards subjects were interviewed by another unfamiliar adult in the aim of eliciting a description of the testing episode (N. Bell)

2) *role-playing*: 57 6-7 year olds attending primary school in Neuchatel, Switzerland were given the conservation test. Immediately afterwards, each child was asked to take the place of the experimenter and show the other child what s/he and the experimenter had just done (M. Grossen)

Both the conversation of liquids test episode and the post-test interviews and role-playing were submitted to an in-depth qualitative analysis.

# Results

### An extract of dialogue between tester (T) and his subject (S) during the conservation of liquids test

T: ..if you drink all you have in this glass and I drink all I have in that glass, do we both have the same to drink or is there someone who has more to drink, someone who has less to drink or is it the same?
S: it's the same
T: it's the same. How do you know that?
S: because I drink all the juice and you too
T: O.K., if we drink it all so/
S:                                    /there's no juice left
T: there's no juice left, yes. But what I'm asking is if you drink all that, do we drink the same amount of juice/
S:                                                        /yes
T: or do you drink more, or do I drink more, what/
S:                                    /we drink both the same
T:hmmm. How do you know that?
S: because I poured the same amount of juice


- Children do not necessarily share the adult's definition of the task nor focus on the dimensions deemed pertinent for task resolution:
  > In the above extract, although the child seemingly give a conserving response, his justification is centred on a premise (the action of drinking) rather than the abstract quantity of liquid, an interpretation which is different from that of the adult

- Children's answers are often the result of a process of mutual construction between the adult and the child:
  > In the above conversation, it is the adult's reformulated questioning which implicitly orients the child to the adult's premises of interpretation and expectations.

## 2. The institutional context

Didactic and testing interactions are embedded in the institutional context in which they take place and thereby come under the jurisdiction of social norms, interactive rules and *communicative contracts* in force in the given context. Interactants will refer to these norms in order to make sense of the interaction.

### Research questions

- What is the role of the institutional context in the construction of children's responses?
- How will children refer to previous scholastic experience when interviewed outside his/her usual classroom context?

**procedure:** 73 8-9 year old children attending primary school in Geneva, Switzerland were asked to give written responses to additive problems (with which they were familiar and had previously demonstrated acquired knowledge) in two different contexts:

1) *collective testing* within their classroom
2) *individual testing* in a face-to-face interview outside of the classroom context

The children's written answers were classified into 2 types of notation used: 1) conventional arithmetical notation, and 2) natural language and drawings (M.L. Schubauer-Leoni).

### Results

<<insert table here>>

- The institutional context in which the testing takes place is not without influence to the form of the answer produced:
    - Although our subjects had previously demonstrated acquisition of conventional arithmetical notation, they do not automatically use this notation learnt in class when confronted with additive problems outside of the classroom context

- The adult's assumption of the nature of the task presented to the child does not necessarily match the child's definition of that same task: what is considered to be a classical scholastic task by the adult and which should elicit conventional notation in resolution is resolved differently when presented outside the scholastic context. Thus, the representation of object of discourse

(additive problems in this case) is articulated as a function of
context of testing in and out of the classroom

# The role of the adult

The assumed or perceived role of adult (tester or teacher) can effect how relationships in social interaction are constructed as well as what type of interactive skills and strategies are engaged. This, in turn, can play a significant part in the child's actualization of a response.

## Research questions

- What is the impact of the presentation of the adult on children's elaboration of cognitive competence in a testing situation?
- Is there a relationship between the perceived role of the adult and the institutional context in which testing takes place? If so, how will this interdependence affect the construction of a response in these contexts?


**procedure:** 99 5 to 8 year old children attending the last year of pre-school and the first year of primary school in the Italian-speaking part of Switzerland were administered the Piagetian conservation of number test in one of two conditions in which the adult presented herself as either:

1) "teacher who wants to understand what the child knows" (*teacher condition*), or
2) "a lady who wants to play with the children" (*playmate condition*)   (M.L. Schubauer-Leoni & R. Poncioni)


## Results


<<insert table here>>

- While the presentation of the adult had no significative difference on conserving responses for pre-school children, primary school children performed much better when the adult presented herself as a teacher than as a potential playmate. We interpret these results as indicating that:

1)   the social roles attributed to interactants can have a structuring effect on children's cognition

2)   this structuring effect varies as a function of the institutional context:
- if the adult's role is *congruent with the institutional context*, it can contribute to the maintenance of the interaction and thereby enhance the display of the expected cognitive skills
- if the adult's role is *incongruent with the institutional context*

(e.g., the adult placing him/herself in the ludic role of playmate in a scholastic context) then this dissonance between expected and presented role can create confusion in the child and thereby lessen the possibility of performing according to the adult's expectation (i.e., displaying an operatory logic in this case)

## General Conclusions

The results of these studies indicate that children's cognitive skills displayed in testing and didactic situations are indissociable from the conditions of their production. The actualization of knowledge in these situations is a socio-cognitive act embedded in the adult-child relationship which is, in turn, embedded in the institutional context. Our examination of the role of the adult, the object of knowledge and the institutional context has shown the complexity of testing and didactic interactions, suggesting that the interdigitation of cognitive and social processes is such that it is difficult, if not impossible, to observe the construction of cognitive skills per se, as they are always dependant to some extent on the social context in which they are elicited and displayed.

see also:

- Schubauer-Leoni,M.L, Bell,N., Grossen,M., Perret-Clermont,A.N. (1990). Problems in the assessment of learning: The social construction of questions and answers in the scholastic context. *International Journal of Educational Research*, 671-683.

- Schubauer-Leoni,M.L., Perret-Clermont,A.N., Grossen,M. (in press). The construction of adult-child intersubjectivity in psychological research and in school. In: M. von Cranach, W. Doise, G. Mugny (Eds.), *Social Representations and the Social Basis of Knowledge*. Bern (Switzerland): Hans Huber Verlag.

- Grossen,M. & Perret-Clermont,A.N. (in press). Psycho-social perspective on cognitive development: Construction of adult-child intersubjectivity in logic tasks. In: W. de Graaf & R. Maier (Eds.), *Sociogenesis reexamined*, New York: Springer-Verlag.

- Perret-Clermont, A.N., Perret, J.F. & Bell, N. (in press). The social construction of meaning and cognitive activity in elementary school children. In: J.M. Levine, L.B. Resnick & S. Behrend (Eds), *Socially Shared Cognition*, New York: A.P.A. Press.

## Type of notation used in resolution of additive problems according to testing context

| | type of notation used | | |
|---|---|---|---|
| testing context | conventional arithmetical notation | drawing/ natural language | total |
| in the classroom | 17 (44%) | 22 (56%) | 39 (100%) |
| outside classroom | 3 (9%) | 31 (91%) | 34 (100%) |

( z=3.04; p<.001)

# Responses to the conservation of number test according to presentation of the testor

## Pre-school subjects
## ( 5-6 yr.s)

| adult role | responses to the conservaton of number test | | | |
| --- | --- | --- | --- | --- |
| | non-conserving | inter-mediate | conserving | total |
| "teacher" | 18 (75%) | 1 (4%) | 5 (21%) | 24 (100%) |
| "play-mate" | 16 (64%) | 1 (4%) | 8 (32%) | 25 (100%) |

(z= 0.7; p.<24)


## Primary school subjects
## (6-7 years)

| adult role | responses to the conservation of number test | | | |
| --- | --- | --- | --- | --- |
| | non-conserving | inter-mediate | conserving | total |
| "teacher" | 4 (16%) | 1 (4%) | 20 (80%) | 25 (100%) |
| "play-mate" | 10 (40%) | 3 (12%) | 12 (48%) | 25 (100%) |

(z= 2.12; p.<.01)