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Review of Monika Boruta-Żywiczyńska PHD thesis

Monika Boruta-Żywiczyńska's PHD thesis is a work on the genesis of the child's communication skills in a particularly interesting phase of his/her development (24 -36 months). More specifically, it is a study on the emergence of the sign function and the role that gestures play in this process. At the basis of the work is the relationship between speech and gesture in the development of the early forms of communication and social interaction in childhood. As the candidate summarizes in the opening of her work, her research is aimed at understanding "how the sign function comes about in children: whether its origin should be sought in speech or gesture, and how the sign perception given in different semiotic systems change with age: whether there are differences in sign comprehension across the three age groups I look at" (p. 40). Although of great importance for the development of human cognitive abilities, the development of the sign function (the ability to understand that a particular expression represents - or stands for - a certain kind of object) in the first years of development has not been yet analyzed as it should in the case of typically developing children (while there are many studies on the development of sign function in children with particular syndromes or with specific cognitive deficits). Thus, the first strength of Boruta-Żywiczyńska work is the focus on a theoretical and experimental level of a topic that has not received the attention it deserves in both national and international scientific debate.

From a general point of view, the thesis is focused on the role of gestural communication in the cognitive development of the child. One of the subjects of greatest interest in this regard concerns the relationship between gesture and verbal communication. An important question, from both a conceptual and empirical point of view, is to establish whether gesture precedes (and is an evolutionary precondition of) speech or vice versa if speech has priority over gesture. The developmental age range examined in the thesis turns out to be of particular interest for investigating this question: the age between 24 and 36 months, in fact, is the time when verbal language becomes more robust; therefore, it is interesting to ask whether in this age range gestural communication is an expressive tool that exploits verbalization to its own advantage or constitutes the basis for speech

development. The analysis of the relationship between gesture and speech is one of the cornerstones of the thesis and an integral part of the theoretical hypotheses supporting the empirical analysis of Boruta-Żywiczyńska work.

The theoretical framework

As for the general framework, Boruta-Żywiczyńska thesis is set within gesture studies, phenomenology, and cognitive semiotics. The definitions of some core conceptual entities underlying the empirical research are therefore in line with such a theoretical framework. First of all, the definition of “language”. Adhering to a multimodal perspective on language and communication, Boruta-Żywiczyńska moves away from the classical definition used in classical semiotic studies. According to semiotic tradition, “language is a conventional system of signs that express ideas, which is used for communication”. This classical perspective does not consider the signs of gestures and images that are not predominantly conventional. Against this view, Boruta-Żywiczyńska proposes an alternative definition of language. In support of the thesis of language as a multimodal system, she endorses the concept of “*linguaging*” proposed by Humberto Maturana to describe the human condition of existing *in* and *with* language. This concept refers to a form of whole-body behavior or whole-body sense of making that has its roots in “embodied cognition”. The reference to embodied cognition as well as the concept of intentionality is the crossing point that allows Boruta-Żywiczyńska to bind together phenomenology and cognitive semiotics, which constitutes the theoretical framework of the experimental project (along with the investigation of the nature of gesture). Cognitive semiotics, according to one of its main illustrious proponents, Jordan Zlatev, is not a subfield of semiotics, but a new discipline integrating methods and theories from cognitive science, linguistics, and semiotics. An important outcome of an empirical research founded on the relationship between phenomenology and cognitive semiotics concerns the implications of the conceptual level on the methodological one: the phenomenological triangulation (the leading methodology used in cognitive semiotics), in fact, allows one to investigate the underlying phenomena from three different perspectives (first, second, and third person). One of the most relevant results of this methodology concerns the analysis of the recursive nature of the conceptual-empirical loop; specifically, the possibility of keeping together two relevant questions with respect to the study of semiotically observed phenomena: the question relating to “What is X?” (e.g. “What is the language/gesture/iconic/sign function?”) and the question “How does X work?” (e.g. “How does the iconic gesture lead to the emergence of the sign?”).

In addition to the reference to phenomenology and cognitive semiotics, the most impressive conceptual apparatus of Boruta-Żywiczyńska research concerns the conceptual and empirical analysis of communicative gesture. Chapter 2 is dedicated to the study of the role of gestures in the development of child linguistic skills. The first three years of child's life are known to be of particular importance for language development. An extensive and careful review of the state of the art of research is therefore presented. Particular attention is paid to the analysis of the age range 24-36 months, which is the range of the child's cognitive development at the center of Boruta-Żywiczyńska work.

Although Boruta-Żywiczyńska focuses on the role played by gestures on the development of the sign function, she also describes the role played by other factors in this development. Alongside the analysis of the expressive system, in fact, she also considers the role of the cognitive abilities (specifically, the capacity of mindreading) involved in the construction of intersubjectivity and joint attention. In the analysis of the development of skills (such as pointing and pretend play) of great importance for the development of language and symbolic thinking, the influence of Michael Tomasello's work is very strong.

An important question regarding the relationship between gesture and word in the early months of life is the analysis of the transition between the phase in which pointing is connected to the use of one-word utterances (to get an object or to orchestrate other's attention) to the phase in which speech-gesture combination is at the base of the two words stage. According to Clark, in this stage "gestures complement first word", a way to argue that spoken word emerges earlier than gestural referents. Against this hypothesis, Boruta-Żywiczyńska proposes that pointing precedes the use of spoken words: "It is incorrect to say that gestures accompany first words: rather, it is words that accompany first gestures, or even sounds that accompany first gestures in the pre-linguistic stage" (p. 67). The experimental research stems from theoretical considerations of this kind.

The experimental project

The main aim of the empirical research proposed by Monika is investigating whether children are able to understand the message conveyed by gestures before they possess the word for the objects to which the gestures refer to or, instead, it is the competence of words that conditions the understanding of the gestures. The experiment focuses on an age range particularly relevant to unveil this issue: three groups of children aged 24, 30 and 36 months). In fact, at about two years of age children begin to produce two words phrases combined with gestures. Hence, the possibility that "this advance in their general knowledge of language functioning may lead to changes in children's perception of

gestures that accompany speeches” is an open question. A good way to approach such a question is studying isolated gesture comprehension. There is no experimental literature on the transition period in which between two- and three-years children begin to perceive isolated gestures as potential components of communication (there is literature on the gesture-word relationship but not on isolated gestures). An important aspect of child language development at the age of 2 years is the understanding of gestural iconicity (around the 30th month, children become more proficient in understanding the iconic relation between hand-shape and referents they stand for). The experiment carried out by Boruta-Żywicyńska aims at investigating “if sign comprehension (defined as the ability to match expression given in two semiotic systems) change with age”. Taking advantage of the distinction between enacting and representing iconic gestures, the main idea is that “sign function emerges first in gesture, and only later in speech” (p. 79). More precisely, at the basis of the experiment there are three fundamental questions.

Research Questions and Hypothesis

The first question concerns the change in the perception of iconic gestures that is linked to age: does the understanding of signs in speech and gesture change in the transition period between 24 and 36 months?

The second question concerns the dynamics of change in children understanding of iconic gestures: is there a difference in children’s comprehension of iconic gestures?

The third question, that with important repercussions also on the topic of language origins from a phylogenetic point of view, concerns children’s ability to understand gestures as signs prior to children’s ability to understand linguistic signs: does the understanding of representational expressions in speech precede or follow the understanding of iconic gestures?

At the basis of these research questions there are three experimental hypotheses:

Since an increase in social practices and linguistic knowledge between the ages of two and three results in better speech and gesture comprehension, the first hypothesis (**H1**) is that the number of correct answers will increase in the consecutive age groups irrespective of the condition (whether the condition is speech, enacting or representing gesture). The second hypothesis (**H2**) is related to the understanding of iconic gestures and is divided into three sub-hypothesis: H2a assumes that there will

be a change in the guessing pattern resembling the social experience and linguistic knowledge children gain between the ages of 2 and 3, but only for items presented as gestures; H2b assumes that the enacting gestures condition is easier for children than the representing gesture condition; H2c assumes that the children across the 3 ages groups will perform significantly better of items labelled as “difficult” in either of the gesture conditions than in the speech condition, which would support the assumption that the sign function emerges first in gesture. The third hypothesis (**H3**) assumes that the children across 3 age group will perform significantly better for items labelled as “difficult” in either fo the gesture conditions than in speech condition, which would support the assumption that the sign function emerges first in gesture (pp. 81-2).

In order to answer the research questions and verify the experimental hypotheses, Boruta-Żywiczyńska designed an experiment including quantitative and qualitative analyses based on a semi-naturalist approach.

30 children divided into 3 different ages: 10 children in each group (2, 2.5, 3 years old).

For the quantitative analysis, Boruta-Żywiczyńska used a forced-choice guessing-game task. The results of the experiment largely confirm the hypotheses and pave the way for an interesting series of reflections on the theoretical issues raised by the research questions.

The first research question (RQ1) was establishing if sign comprehension in speech or gesture changes in the transition period between 24 and 36 months and the hypothesis was that children will be getting better with age. In line with the hypothesis, statistical analysis of the collected data showed that there is an overall increase in children ability to recognize the meaning behind spoken words and iconic gestures. **H1 was confirmed.**

The second research question (RQ2), related to the understanding of iconic gestures generated, as we have already said, three sub-hypotheses. The first sub-hypothesis (H2a) that the children will be getting better in guessing iconic gestures with age **was confirmed** (in a similar way to what has been found in the evaluation of H1, age of children positively influenced their ability to perceive iconic gestures as signs.) The second sub-hypothesis (H2b), the hypothesis that children will be getting higher score for enacting gestures than for representing gestures regardless their age, **was not confirmed.** Referring to the third sub-hypothesis, however, the experimental data show that considering the age of children, enacting gestures are easier to comprehend (although there is no

difference in comprehension between the two types of gestures in the 24-month group, there is a significant difference in the 30 and 36-month groups in favor of enacting gestures).

The third research question (RQ3), the one with repercussions also on the topic of the origin of language, concerns the development of sign function in the relation to speech and gesture. Boruta-Żywiczyńska hypothesis (H3) was that the sign function emerges in gesture earlier than it does in speech (especially for the items they are unlikely to know at the age). **The hypothesis was not confirmed:** “statistical analysis revealed that children do significantly better in speech compared to either gesture condition, for the items labelled as “difficult”. Interestingly, the analysis also showed that, for “difficult” items, enacting condition was significantly easier to guess in spite of the age of the children” (p. 141). Although, on the basis of the results of statistical analysis, it is not possible to maintain that the sign function (the ability to perceive and understand signs as meaningful) emerges in gestures earlier than it does in speech, the results of the experiment clearly show that the sign function changes with age (both in the period between 24 and 30 months, and especially in the period between 30 and 36 months).

In addition to quantitative analyses, Boruta-Żywiczyńska also employs a qualitative analysis allowing to shed light on the source of behaviors performed by children as well as their mistakes during the execution of the task. The most relevant result that emerged from the qualitative analysis is an unexpected data concerning a phenomenon named by Boruta-Żywiczyńska “when pointing doesn’t point anymore”. It is a phenomenon that shows to what extent pointing, through triadic interaction such as joint attention, is a constitutive ability for human communication and for the development of sign function. Pointing, in fact, is a key behavior “that orchestrates attention of others and enables a child to achieve her communicative goals as early as in the prelinguistic stage”.

The interesting fact emerging from the qualitative analysis is that pointing shows its strength of attraction even in the case in which the gesture is produced without any purpose to orchestrate others’ attention. This phenomenon is exemplified by the case of iconic representation of the “fishing rod” item (one of the elements of the said gesture was an erect pointing finger, directed upwards diagonally, while the rest of the fingers was folded into a fist). In this case, it is like pointing claimed its primary function of attentive recall with respect to the higher order representative function. Another interesting result in this respect is that the ability to detach pointing from the representational form of the gesture grows with age: “the youngest group manifested the strongest reaction to point: the children would not only look for the item that was as-if pointed at, but also automatically imitated

the shape of the hand and performed the gesture together with the researcher. They would also ask clarification questions, such as “There?”, accompanied by pointing gesture” (pp. 159-60).

Concluding remarks

In her PHD thesis, Boruta-Żywiczyńska analyzes the development of the sign function in the child taking advantage of empirical and conceptual research. The theoretical background provided by the crossroads between phenomenology, cognitive semiotics, gesture theory, and interpretative models relating to child cognitive development constitutes a solid basis for the research and gives the experiment an important role in addressing issues of great theoretical relevance. The general theme of the relationship between gesture and speech (as well as the evolutionary priority of one over the other) is the background to the entire work.

The experimental setting is carefully constructed and proves to be particularly effective in order to verify the hypotheses and answer the research questions. Both the research questions and the hypotheses underlying the experimental protocol could contribute to the current literature on the nature of the relationship between gesture and speech; specifically, they provide important insights on the analysis of the role that gesture and speech have in the development of the sign function. The empirical results confirm most of Boruta-Żywiczyńska hypotheses. I think that even in the case of a failed verification, they can be of particular interest for future research as shedding light on an age range which has not been investigated as it would deserve. Following these considerations, my opinion is that Boruta-Żywiczyńska research fills an important gap in the study of the origin of sign function in children. My general judgment of her thesis is very positive, and I strongly support the transition to the next step which leads Monika Boruta-Żywiczyńska to defend her thesis in front of the PHD commission.

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