The representation of time course events in visual arts and the development of the concept of time in children: a preliminary study

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Abstract—By means of a careful search we found several representations of dynamic contents of events that show how the depiction of the passage of time in the visual arts has evolved gradually through a series of modifications and adaptations. The general hypothesis we started to investigate is that the evolution of the representation of the time course in visual arts is mirrored in the evolution of the concept of time in children, who, according to Piaget (1946), undergo three stages in their ability to conceptualize time. Crucial for our hypothesis is Stage II, in which children become progressively able to link the different phases of an event, but vacillate between what Piaget termed ‘intuitive regulations’, not being able to understand all the different aspects of a given situation. We found several pictorial representations — mainly dated back to the 14th to 15th century — that seem to fit within a Stage II of children’s comprehension of time. According to our hypothesis, this type of pictorial representations should be immediately understood only by those children who are at Piaget’s Stage II of time conceptualization. This implies that children at Stages I and III should not be able to understand the representation of time courses in the aforementioned paintings. An experiment was run to verify the agreement between children’s collocation within Piaget’s three stages — as indicated by an adaptation of Piaget’s original experiment — and their understanding of pictorial representations that should be considered as Stage II type of representations of time courses. Despite the small sample of children examined so far, results seem to support our hypothesis. A follow-up (Experiment 2) on the same children was also run one year later in order to verify other possible explanations. Results from the two experiments suggest that the study of the visual arts can aid our understanding of the development of the concept of time, and it can also help to distinguish between the perceptual and the cognitive constraints (i.e. representational or cultural) in the representation of the succession of events.

Keywords: Concept of time; development study; visual arts; simultaneity; succession.

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INTRODUCTION

The conceptualization of time has interested some of the most brilliant minds of our history, from Aristotle to Einstein. A basic question within such conceptualizations concerns the perception of time itself. The flow of time is the most striking feature that shapes its experience; hence, any account of our perception of time must consider this aspect of our experience. Many have stressed the importance of the mental representation of time as a key to understanding its perception. The fact that the study and definition of time needs a representation of it stems on the paradox that psychological time — which should be the perceptual counterpart of physical time — is somehow irreconcilable with physical time.

The study of time has indeed been approached according to two different perspectives, one of which is dubbed as cosmological (or physical), and the other as psychological. According to the cosmological perspective — which started with Pythagoras and was developed by physicists and philosophers such as Newton and Kant — time is a continuous and homogeneous dimension that can be divided into infinite units called instants; these are all identical, and in this they resemble the knowledge of points in geometry. In physical time there are only simultaneity and succession of identical instants. Physical time does not flow at all and has no past or future: it is only an infinite series of instants.

According to the psychological perspective — which started with Plotinus, was very well described by St. Augustine, and was developed by Husserl and Brentano — time is inhomogeneous and it flows from past to future, passing by a present that has a duration and a definite direction, often referred to as ‘the arrow of time’ (Price, 1996).

The two perspectives are irreconcilable but unavoidably interconnected. Aristotle was probably the first to point out this fact when he claimed that time is “the number of motion with respect to ‘before’ and ‘after’ ” (physical perspective), yet “without the counter (i.e. someone who counts) there will be no number” (psychological perspective, Physics 219b, 1–2). Starting from Aristotle’s point, Augustine claimed that not only do present, past and future exist in the human mind, but also that they are the human mind. Present as an experience, being temporally extended and ‘tensed’ — which means that it concerns the past and the future — is very different from the objective present postulated by the physical perspective, in which the only possible relationships concern precedence and simultaneity between instants. Time is thus the essence of the mind (distensio animi, in Augustine’s words), and the tensed feature of time is due to the representative ability of the mind itself. It is for this reason that most of those who studied the problem of time concluded that the only way that the human mind has to understand time is to represent it. Among these were Husserl (1928) and Brentano (1874), the authors of the most keen analyses of psychological time, and also the mentors of many Gestalt psychologists. Probably it is not by chance that Wertheimer (1912) — Husserl’s student and father of the Gestalt theory — began his studies by analyzing apparent motion: if physical time