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Representation and Learning

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Presumably, one's representation of the world is intimately tied to what one has learned. The how and why of this representation in turn informs us about the process of learning. However, despite a long standing interest in the emergence and development of representational competence, researchers are far from having achieved consensus on a definition of the term representation. Rather, the problem of representation has generated nearly as many theories as there are theorists in the field of cognitive development and learning.

In an effort to impose some order upon this confusion, Mandler (1983) identified "two senses" of representation. "The first of these," according to Mandler, "Refers to knowledge and the way it is organized." Mandler notes that this complex conception concerns both what is known and how that knowledge is structured. She continues,

The second usage is the more traditional and familiar one, namely representation as the use of symbols. Representation in this sense refers to words, artifacts or other symbolic productions that people use to represent some aspect of their knowledge of the world. (p. 420)

Mandler's distinction between these two senses of representation is a useful metaphor in that it helps to articulate differences in the foci of those participating in discussions of representation and learning, whether these discussions are between researchers, theorists or practitioners. However, as Paris and Cross (this issue) might point out, this metaphor also has its drawbacks. Clearly, those focusing their questions on what is symbolized are at the very least making assumptions about how the process of this symbolization takes place. Alternatively, those focusing their questions on organization are also presuming that representational products follow from knowledge.

The articles in this and a forthcoming issue of the *Genetic Epistemologist* are intended to reflect the range of contexts within which questions relating to representation and learning are currently being studied. As "working papers" they are intended to present an overview of current projects and provoke other questions. Each of the following papers illustrates the utility of Mandler's two senses of representation in addition to some of the problems of this dichotomy.

¹This has been a fully collaborative project. Order of authorship does not reflect a senior/junior relationship.

Both the Forman and the Downs and Liben papers are primarily concerned with representation as the use of symbols. Forman addresses symbols generated by the child with the assistance of a computer. Downs and Liben discuss children's understanding and misunderstanding of maps. However, both papers are specifically concerned with the role of the child's knowledge structure as well. In both cases, a failure to consider the knowledge system of the child might lead a) to misconceptions about the child's understanding of symbolic artifacts, and b) to less than optimal strategies for promoting children's developing knowledge of symbols. The authors of these papers would probably agree that one cannot understand representation in the second sense without reference to the first.

De Lisi's paper is primarily concerned with the role of others in the young child's ability to consciously represent or to conceptualize the means to a goal prior to action. To represent here does not refer to the use of a communicative symbol; it does refer to a specific kind of knowledge and its organization. Importantly, the child he describes is not engaging in full fledged representational activity. Instead, De Lisi, in the tradition of Piaget, maintains that the child's knowledge system is sensori-motor and still prerepresentational (Piaget, 1963). However, the adult assisting the child is engaging in representational activity and De Lisi describes how the constraints and support provided by the adult direct the child's newly emerging representational competence.

From a somewhat different perspective, Paris and Cross in their analysis of the metaphor, zone of proximal development, also argue the need for more attention to the role of the social world and interactionist concerns. They suggest that metaphors generally, and the zone of proximal development more specifically, have many limitations as symbols. When employed by developmental theorists and practitioners, a metaphor such as the zone of proximal development becomes useful not because of what it represents but because of how it helps us reformulate and articulate what we bring to another's representation. Like Vygotsky, Paris and Cross do not obviously distinguish between representation as knowledge organization and representation as symbolic artifact. Rather, Paris and Cross are asking us to reflect on the implications of the dichotomy and to think more closely about the link between representation and the process of learning.

In conclusion, the four papers in this issue illustrate the diversity of problems and approaches falling under the heading of representational development. These papers demonstrate the role of representation across diverse behaviors and domains of thought. They also reflect a blending of a traditional Piagetian constructivist approach with complementary orientations to domains of specific knowledge and the social context of development.

Obviously, research within different contexts affords the opportunity to address different components of both representation and learning. As editors, our hope is that by reading across contexts researchers and practitioners will

glean some understanding of complementary approaches to representation and learning and will in turn raise questions that are informed by the breadth of the topic as it presently exists.

References

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