EDITORIAL INTRODUCTION

On November 18-20, 1995 in Kazimierz on the Vistula River, a picturesque Renaissance village somewhere in East-Central Poland, the Workshop on Permanence and Change in Conceptual Knowledge was held. As I had stated in the workshop prospectus, the idea was [...] to bring together scholars working on conceptual representations to discuss and develop research programs focused on the change and stability in conceptual knowledge in a variety of cognitive tasks, and at any stage of development. The development of ontological and causal concepts, internal (structural) and external (e.g. linguistic and cultural) constraints on conceptual knowledge critical periods for conceptual change, domain specificity as well as formation of ad-hoc conceptual models to solve problems, and concept transfer in analogy and metaphor processing, are all in the range of topics we are interested in. The idea is to discuss research programs rather than particular experiments and data. For these reasons we would prefer papers that link data with open questions, and not only inform but also stimulate other participants' thoughts.

The present issue of this journal contains the results of the workshop. As usual, only some of the workshop aims were achieved. In the charming surroundings and stimulating atmosphere fourteen active participants of the workshop presented and discussed their research at different stages of realization. A relatively wide scope of interests in conjunction with the relatively small number of participants caused the workshop as a whole to be perhaps too heterogeneous. However, that diversity of topics produced also what was desired: many open questions remained open but enriched after the workshop. This introduction, as well as papers in this volume and the final debate section, are intended to report those inquiries.

Not every workshop participant decided to submit a paper to this issue. Some of them are represented only by brief abstracts, some are not represented at all. The papers vary in length and form. Although most of the papers presented here are revised versions of workshop presentations, my intention was to preserve their original format, rather than to require the authors to keep the standard journal article form. On the one hand, in some cases this has resulted in more speculative, less grounded and questionable theses, but on the other hand it allowed us to retain the stimulating, lively, and provocative spirit of the workshop.

Three topics seemed to be the most persistent and re-iterated across the papers and debates. These were: levels of conceptual representation, the relation between con-

ceptual and linguistic systems, and internal and external (especially educational) factors in conceptual change. In the following sections a brief introduction to those issues is presented.

Levels of conceptual representation

The problem of the levels of conceptual representation was at least implicitly present in almost every paper at the workshop. This problem also seems to be a common thread linking the remaining problems. We were talking about very different kinds of mental representations, but each of them somehow dealt with concepts. Cees van Leeuven presented the dynamic system representing basic conceptual units in perceptual space. Susan Gelman, Dedre Gentner, György Gergely, Alison Gopnik discussed very basic principles of conceptual and linguistic representations. They proposed very distinct kinds of principles, however. Gentner suggested that the earliest conceptual representations of noun meanings are mostly formed on the basis of shape similarity which is a property of a general perceptual domain. Abstract categories, the representations of attributes actions, and processes (as well as words or other linguistic forms representing them) should be acquired in a much more complex culture- and language-dependent way. Gergely et al. also suggested a perceptual mechanism which allows early acquisition and differentiation of concepts, however this mechanism extracts from the perceptual array what is not given directly: the rationality of movements. An infant uses it to develop his/her theory of mind and intentional action. There is a list of other similar (parallel as well as competing) mechanisms in object and movement perception that are claimed to make the child able to form domain-specific naive theories. Both Gelman and Gopnik start with the notion of naive theory. However, while Gelman claims that, at least for natural kind concepts, all the child is equipped with is the implicit notion of "kind", and the scientific-like theories based on essentialist assumptions are perhaps a later product of development. Gopnik argues that even at very early stages children use a special mechanism for hypothesis formation and testing when learning categories (classifications) and words.

Two papers took up the problem of the level of conceptual representations explicitly. Tomasz Maruszewski and El¿bieta Sciga³a (not included here) argue that emotion has to be represented at three distinct but closely interrelated levels: basic experiences of emotions (image code with the structure of scripts and exemplar representations), prototypic emotions (verbal code, scheme and prototype structures), and core conceptual knowledge of emotions (abstract code, naive theories). Each level has its specific place in regulation of perception, behavior, and in development of the representation of emotions. Nick Braisby and Bradley Franks suggested indirect multilevel relations between concepts and words that denote them. At the most concrete level, words refer to specific individuals, while at the most abstract level they denote concepts involved in a rich naive theory structure. The concept-word relation, called by the authors a *perspective,* is dependent on pragmatic factors.

Domain specificity discussed in my paper is also one of re-iteration of the level-ofrepresentation problem. Do children (as well as adults) really form and use domain

specific knowledge structures, even though most of the real-world events cross do-main boundaries? How could cross-domain representations be created? Are universal cognitive categories (e.g. color, shape etc.) used in a domain-specific manner?

Concepts, words and language

Almost every paper at the workshop was concerned also with the relation between concepts and words or language in general, and for Nick Braisby & Bradley Franks, Dedre Gentner, Tiia Tulviste, and Twila Tardif that was the main topic. Other authors used at least naming, acquisition of words, or other verbal tasks as indices of concep-tual processes. The methodological consequences of that are vigorously discussed in Braisby and Franks' paper. But there is also another question still alive in spite of a very long tradition in philosophy, linguistics and psychology: do some forms of con-ceptual representation and reasoning rely on language structures, or is acquisition of word meaning dependent on (or even equivalent to) conceptual knowledge? Some of the authors advocate the first possibility in Whorf and Vygotsky traditions. Others (Gelman, Gopnik, and Tardif) took the opposite position. The problem corresponds to the issues of levels of representations (verbal codes, conscious knowledge), domain specificity, and the impact of culture and education on conceptual knowledge which is the last issue presented here.

Conceptual plasticity, culture, and education

We have just asked whether the initial conceptual principles could be overwritten in the process of development. Here we restrict this question to a more narrow one: can concept acquisition or conceptual change be invoked by cultural settings, and especially by education? The worldwide crisis of education has made that question extremely up-to-date (see scientific programs of AERA Annual Meetings across the last few years, or other professional meetings concerned with education: see also the abstract of Svetlana Sheveleva's talk). Unfortunately, both papers in this issue that explicitly considered these problems led to some pessimism. As reported by Eve Kikas, fourteen-year-old students taught about day-night and seasonal change at the age of ten, forgot the school knowledge and returned to their initial models. Similarly, in the experiment by Katarzyna Stemplewska-Żakowicz on learning an invented biological world, the intended verbal instruction have no advantage over learning by experience (computer game based on principles governing this invented world), moreover – it can decrease learning effects when incongruent with experience.

What properties of the knowledge system caused such resistance to change? What are the most stable or the most persuasive (and thus hard to break down) conceptual structures and processes? And, at the same time, what makes for cultural variability in knowledge and the qualitative differences between the knowledge of an adult and that of an infant?

I hope that papers and debates in this issue have given a partial answer to these questions, as well as to those discussed in the earlier section. But to give a ready answer was not crucial to our enterprise. More important is that we were looking for

new formulations of problems, empirical proofs, and answers – that not only children's, but also our old, mummified minds change.

Finally, a bit of demographic statistics of our workshop. The *modal* participant was between thirty-six and forty, and had three children (that's good prognostics keeping in mind that most of the workshop was developmentally oriented). On the contrary, the *average* participant had only 1.3333 children and was in 66.6667 per cent a woman. There were fifteen participants giving talks, including one disembodied (Twila Tardif was heroically fighting against schizophrenia when reading Susan Gelman's paper in the first person form: "I – Susan ..."). Graduate students occupied all remaining places around the table.

What is very interesting, all participants at the time of the workshop were affiliated with institutions situated in a very long (almost 10,000 kilometers), but relatively narrow (only about 666 miles wide), regular zone stretching from North-Eastern Europe to South-West Coast of United States.

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