



Editorial

The sociocultural construction of implicit knowledge

There is undoubtedly agreement today that it is essential to consider children's cultural context if one is to understand their cognitive development. This concern with the cultural context is no longer new and has been an integral part of developmental psychology for more than half a century. However, the synthesis between the more traditional theories that emphasise age-related, internally driven processes and the analysis of the cultural context is a more recent accomplishment in developmental psychology. Over the years, the obstacles to achieving this synthesis have been many. Initially, there was the either-or conception of developmental processes — either internally driven or culturally mediated processes should explain children's development. Nevertheless, with time and the influence of theoretical perspectives that emphasised cultural tools and social interaction, as well as logic and actions in the physical world, the apparent contradiction between cultural and internal processes was brought together in a synthesis.

A second obstacle has proven more difficult to conquer: the implicit nature of the features that shape development within a cultural context. To take an example: numerous studies showed that Japanese students perform better at mathematics than their U.S. counterparts, but it took researchers about two decades to start understanding the reasons for these differences. There are obvious differences between the English and Japanese oral counting systems, but there also seem to be differences in classroom organization and practices, the aims of mathematics lessons and the structure of the curriculum, the importance attached to mathematics achievement in the two cultures, the nature of the folk child psychology explanations for differences in achievement, the leeway in waiting for good performance to be achieved, and how weak a performance must be to be considered not good enough. Apart from the differences between the counting systems, all the others can be identified as differences in 'common sense' — in ways of thinking and feeling about mathematical competence which are so obvious to the members of the culture that they are more like lenses we look through than objects that can be analysed. These lenses are what is taken for granted in a particular cultural milieu;

they are what we mean by implicit knowledge, the topic of this special issue. The papers in this issue provide examples of different methods and features to be considered in the analysis of implicit knowledge and its sociocultural construction.

Implicit knowledge has traditionally been studied in the laboratory as the result of individual learning processes. For example, in cognitive psychology, explicit learning is called declarative, implicit non-declarative. However, implicit *cultural* knowledge is not merely an individual product; it is the residue of socio-cultural construction — the products of groups and of individuals in interaction. The theme of this volume is an analysis of sociocultural processes by which the “taken-for-granted”, implicit cultural knowledge, gets constructed. These issues are explored in three developmental arenas: (1) cognition and apprenticeship, (2) language and communication and (3) formal education.

In the first section, Greenfield, Maynard and Childs begin by describing historical changes in social representations of weaving among the Zinacantec in Mexico. The historical and cultural change in the activity of weaving — from a domestic to a commercial activity — brings with it a new cultural context that includes a reduced availability of adults to guide the apprenticeship of weaving, a new implicit pedagogy that allows for trial and error and greater independence during the learning process, and new cognitive gains manifested in the transferability of spatial skills learned in weaving old patterns to the representation of unfamiliar patterns. In the second article of this section, Maynard and Greenfield further show that the implicit child development theories have not changed in the same context: the age-related time tables continue to be embedded in the difference between setting up a toy loom, which does not demand mental spatial transformations, and setting up an adult loom, which does. Together, the two papers illustrate the tension between the internally driven developmental processes and the flexibility in the development of skills that relate to the cultural context. Greenfield and her colleagues use a combination of experimental and statistical methods in their investigations, illustrating the power of traditional methods in developmental psychology in the treatment of the new problems of cultural context.

Leading off the second section on language and communication, Senghas investigates a related issue of changes in the cultural context. However, she considers this issue in a direction often ignored in developmental psychology, but undoubtedly of great importance: instead of considering what the tutors transmit to the new generation, the article considers what the new generation creates that remains unknown to the tutors. The main thesis here is that languages must be learnable and that their own historical changes thus should be influenced by children’s development. Spatial modulations that are treated as not conveying meaning in Nicaraguan Sign Language by adults who were in the first generation of learners are given meaning by later generations of learners. The participation of the new learners in the language learning processes promotes changes in Nicaraguan Sign Language, which should be transmitted to subsequent generations of learners. Though grammatical knowledge is often only implicit and transmitted to the next generation without explicit instruction, interviews with the younger learners seems to elicit explicit

formulations of this knowledge. Senghas' methodology is typical of psycholinguistic studies, combining analyses of comprehension and production.

Implicit knowledge of interactional rules is investigated in a detailed, quantitative analysis of mother–infant interactional synchrony by Gratier. Her contribution includes the development of new methods of analysis and the identification of differences in synchrony and expressive styles between cultures, as well as between groups from the same culture as a function of emigration. The triangulation of methods used by Gratier shows a convergence between new methods of acoustic analysis and the quantitative treatment of questionnaire and interview data. It allows for a rich description of the interplay between implicit processes of early communication that are potentially universal and features of this communication that are constructed in a culturally distinct style. Gratier speculates that the timing differences between the Indian mothers, on one hand, and the French and U.S. mothers, on the other had, might be connected to the interdependent versus independent styles of socialization of these cultures. Indian mothers and babies are more “together” in their communication insofar as they overlap each others' vocalizations and utilize shorter pauses between speakers.

Gratier also demonstrates the consequences of immigration for these implicit processes of mother–infant communication. Indeed, it turns out that immigrants can no longer take either culture-specific or culture-general features of mother–infant communication for granted: Gratier shows that immigration can simultaneously modify specific cultural style and disrupt potentially universal processes of mother–infant communication. Thus, immigrant mothers and infants are both more independent than Indian dyads in India and more interdependent than U.S. dyads in Northern California. They show intermediate values both in the length of pauses between mother and infant “turns” and in the amount of overlap in the vocalizations of mothers and infants. That is, after Indians immigrate from India to the United States, mother and infant become more separate and individuated in their interactional style, developing more distinct “turns” and greater pauses between vocal turns.

In this, Gratier echoes a theme in the article by Greenfield, Maynard and Childs. The latter find, through a longitudinal research design, that historical change in the ecocultural niche (from subsistence to commerce) has decreased interdependence and increased independence in the domain of sociocultural apprenticeship. In parallel with this effect, Gratier finds, through a cross-sectional research design, that immigration from India to the United States, a more commercial individualistic society, has decreased interdependence and increased independence in the domain of mother–infant vocal communication.

In sum, Gratier's research indicates that cultural patterns are taken for granted — they become implicit knowledge — precisely because they are interactively constructed in the first months of life. She also demonstrates how these patterns and processes can be disrupted by immigration.

Leading off the section on formal education, Windrass and Nunes also examined the difficulties of immigrant parents and children, but using a different method — case study. This method is rarely used in developmental psychology, but their study

shows how valuable it can be. Although the authors did not set out to investigate styles of socialization, the themes raised by the parents and teachers interviewed, as they spoke about teaching and learning, led to the interpretation that their misunderstandings might result from differences in their social conception of schooling. For the Montserratian parents, teaching and learning are interdependent, just as the school's and the family's role should be in the function of educating children. The interpretation derived from the interviews was triangulated with the analysis of parents doing homework with their children, where the issues of interdependence emerged again in the parent–child interactions.

Pretzlik, Olsson, Nabuco and Cruz contribute further to the description of implicit knowledge in the context of schools, providing an insight into what influences teachers' perceptions of their pupils as more or less intelligent. Pretzlik et al. show that teachers in London and, to a lesser extent also in Lisbon, attribute considerably greater importance to verbal aspects of intelligence in the academic context than they do to mathematics. Their implicit definition of their pupils as more or less intelligent has important consequences for the pupils, who perceive themselves and each other in the same light as they are perceived by their teacher. It is puzzling why this social influence seemed less powerful on younger children in Lisbon than on younger and older children in London and there is, consequently, need for further research in this domain. The work by Pretzlik et al. makes a significant methodological contribution as well as a substantive one: similarly to Greenfield et al., the investigation shows how quantitative techniques can be used to model implicit knowledge. It helps us understand teachers' implicit theory of academic intelligence and social influences on children's self-perception as learners.

To conclude, these six articles identify a variety of issues that help us better understand the implicit knowledge that is an essential part of the cultural context in which children grow and learn. It also shows different methodological paths that can be used in future research on the nature of this cultural context and the sociocultural processes by which it is constructed.

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