



## Construing geometric shapes in a language literacy context: Defining and classifying triangles in Greek kindergarten

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### ABSTRACT

Some findings deriving from a wider research concerning Greek kindergarteners' definitions and classifications of geometric shapes are presented in this paper. Our theoretical framework as well as research tools draws from the sociosemiotic approach of Systemic Functional Linguistics, according to which the use of linguistic resources activates meaning systems assumed to be relevant to specific learning contexts. In order to examine how young children make use of their linguistic potential, we set up a learning context related to language literacy pedagogy such as the production of a "book about geometric shapes" intended for other preschool children. Interactions between children and their preschool teacher have been analysed so as to illustrate semantic options relevant to the semantic organisation of geometric, uncommonsense knowledge categories.

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### 1. Introduction – theoretical framework

Familiarising pupils with the discourses of various disciplines constitutes the principal endeavour of school education. If literacy is defined as participation in learning practices of various discourses through semiotic systems involving written language (Hasan, 1996), then school is the institution where such practices in fields of uncommonsense knowledge (Painter, 1999b) are applied. First school literacy constitutes a crucial milieu for the connection of everyday experience and commonsense knowledge with uncommonsense knowledge fields. In other words, it is a favourable area for the development of semiotic processes underlying *the re-shaping of human experience* (Halliday, 1999).

From a sociosemiotic perspective, our categorisations of things/entities, that is to say our everyday as well as more specialised classifications, are produced through semiotic processes within social contexts and by socially situated subjects, negotiating meaning or producing new meanings, mostly through language. The semiotic potential of lexicogrammar enables us to form categories of meaning, that is to say ways to conceptualise the social, inner and external world. From this language-based approach to learning, language learning is interrelated to the attainment of socially constructed knowledge, to the socially mediated linguistic means of giving meaning to experience (Halliday, 1999).

School knowledge, although actually formed through the dialectical relationship between oral and written language, is based on written language and targets systematic/uncommonsense knowledge (Halliday, 1996, pp. 353–354). In this sense, "it is rather doubtful that the ability to engage in educational discourses could develop naturally without experience of the educational processes" (Hasan, 1996, p. 398). Previous experiences and language resources, developed through children's participation in less formal learning contexts, still constitute the basis for school learning. Recognising and utilising children's

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potential and background is, in fact, the only option for teachers, especially on the entrance of children into the education system, in order for different contexts and contents of learning to be “scaffolded”.

Painter's insightful studies (Painter, 1996, 1999a, 1999b, 2007) into linguistic development and learning in the early years of a child's life (2:5–5 years of age) and her sociosemiotic approach of analysis paved the way for the focus of our investigation. Following the theoretical framework of Systemic Functional Linguistics (SFL), Painter's (1999a) case study on spontaneous everyday interaction shed light on the semiotic mediation grounded in verbal interactions between children and adults and stressed the continuity of family literacy processes and the ways in which they are connected to systematic/educational literacy. Her conclusions also made clear that engagement in classifications and definitions, namely the familiarisation with some “specific semiotic processes” (Hasan, 1996, 2005a), constitute the appropriate linguistic preparation for the transition to educational/uncommonsense knowledge (Painter, 1999b).<sup>2</sup>

Based on the above theoretical framework, our research assumes that the development of semiotic processes such as definitions and classifications related to the construction of knowledge of geometric shapes, implies the linguistic realisation and negotiation of their meaning within suitable teaching settings and meaningful contexts of action. More specifically, the study of classroom interaction can illustrate aspects of the ways in which *geometric shapes* are construed by kindergarteners, shedding more light on the linguistic-semiotic construction of an ordinary area of school knowledge. Moreover, such studies can support the assumption that a structured school literacy context encourages the development of specific semiotic processes, such as generalisation, classification and definition, considered to be fundamental for the development of school knowledge. (For related studies in Greek kindergarten, see Douka, 2003; Kondyli & Archakis, 2004; Kondyli & Lykou, 2008).

We have not noticed previous research concerning young children's realisations within contexts of early mathematical knowledge from a linguistic perspective. An exception is, however, to be found in the paper of Mohan and Slater (2005) which addresses issues of 6–7 year-old children's reasoning in a ESL science class under the overt instruction of their teacher, in order to create a (simple) theory of magnetism. In their research they adopt a linguistic perspective (SFL), so as to provide evidence of the language-based approach to teaching and learning. Our study could be seen as a complement to Mohan and Slater (2005) work insofar as it investigates linguistic realisations of kindergarten pupils, albeit with a different *literacy pedagogy*: (a) less teacher-centred, mainly focusing on the interaction between children, so as to construct a common understanding of geometric shapes, and (b) a language literacy approach – even if the area we are focusing on technically speaking belongs to maths literacy. Moreover, it should be noted that, since the material and/or semiotic basis of science literacy (observation of experiments) differs from that of geometry, the respective semiotic processes are not all that similar.

We should also note that in the case of the Greek kindergarten, despite the claim of Interdisciplinary Common Curriculum Framework for Kindergarten (D.E.P.P.S., 2003) about the *cross-curriculum character* of language, the sociosemiotic nature of the language, as well as the role of verbal interaction still remains obscure. It is worth mentioning that the *basic concept* of “System-classification” is mentioned in all other areas (*Mathematics, Environmental Studies, Creativity and Expression, Computer Science*) but not in *Language*. Our investigation aims to illustrate the language and learning relationship in literacy processes, including that of geometry. In our case, instead of following a typical to early maths literacy sequence of geometric tasks, we provided a language-based literacy project (a book about geometric shapes), in order to fully adopt the cross-curriculum character of D.E.P.P.S.

On the basis of the sociosemiotic perspective about the systematic and dialectical relation among context-meaning-grammar (Hasan, 2005a), we made the following assumptions:

- Given that the relation between semantic and lexicogrammatical choices is one of *realisation*, the analysis of the dialogues – emphasising on the linguistic realisations of the children themselves – allows us to study the semantic choices made by groups of children as language users within the field of research (semantic organisation of an uncommonsense area of knowledge).
- In their developing semantic system, such as that of uncommonsense knowledge, children are expected to use meanings they have constructed on the basis of their *previous experiences* (everyday and/or school literacy contexts), considered to be relevant to this particular context.
- However, given that *the context itself* directs children towards specific choices, elements concerning the organisation of the suggested teaching setting are in fact structural parts of the situation, crucial for children to construe meaning and therefore, for their linguistic choices as well.

The above assumptions formed the framework for the literacy pedagogy adopted in our research. In the paper, evidence about the ways in which language is constructed in areas of uncommonsense knowledge in the Greek kindergarten is provided. More specifically, data concerning classifications and definitions of triangles are presented.

<sup>2</sup> The claims above recontextualising Vygotsky's theory (1978) of sociogenesis of thought and of social mediation in the construction of “higher mental functions” on the one hand, and Bernstein's theory (1990) about differences in contexts and uses of language (contextualised/decontextualised) on the other in connection with the distance from the immediate experience and the material basis of their production, are specified in the theoretical model of Systemic Functional Linguistics (SFL). (For the discussion about the interconnection of Vygotsky's, Bernstein's and Halliday's ideas and on the dialectic relationship between the social and the semiotic, see Hasan, 2005b).

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