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Number words in 'other' languages: The case of little Marram

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The present paper, based on a small scale critical ethnographic study, explores the process of experimenting collaboratively with multiple language use for number words as part of young children's mathematical learning activity. Data from a teaching experiment called 'Number words in 'other' languages' is utilized to illustrate the creation of a culturally responsive context with children aged 4 to 6, their parents, the classroom teacher and the researchers. The focus is on the case of little Marram, a Pakistani girl who lives in Greece and who experiences participation by sharing number knowledge in her dominant home language, Urdu. It is highlighted how discourses on gender and language determine Marram's learner identity-work in the multilingual preschool classroom.

Keywords: Early mathematics, language use, gender, discourses, classroom practice, identity-work.

INTRODUCTION

In a number of previous studies we have denoted the benefits of diverse language use in the mathematics classroom as a matter of resourcing learning (Planas, 2014), creating dialogicality (Chronaki, 2009) and, also, troubling essentialist identities embedded in school mathematics discursive practices (Chronaki, 2011). We now focus on an experimental collaborative project, *Number in 'other' languages*, where the design of learning for number and number word is orchestrated around the utilization of the participants' languages in a Greek classroom. Multiple language use can be interpreted as a resource for engaging children from ethnic minority groups, and as a space for reconfiguring subject positions in processes of learner identity-work. Taking into account that ethnic minority learners experience marginalized subject positions in school, the shifting relations encouraged

via opening the learning of numbers in multiple languages may create conditions for breaking the certainty of hegemonic discourses and provide space for accessing dialogicality. As a Bakhtinian concept, dialogicality weaves a way to critique language formation in literary texts. Bakhtin in a series of texts (1929/1981) negates language as an abstract system and emphasizes its intersubjective consciousness. By perceiving language use as social in nature he conceives language, communication and identity as interactive multi-voiced phenomena rooted in specific localities. As such, the idea of teaching number words in multiple languages becomes a gesture of how mathematical knowledge can be approached as culturally and politically situated. In this way, mathematics becomes a space for providing access to children's own trajectories as part of their own identity-work and subjectivity configuration (Chronaki, 2009, 2011).

During the development of the present collaborative project, the first two authors observed, depicted and interpreted the complexity of the teaching activity as experienced by children coming from socially marginalized groups. The experiment was designed to serve goals of counter education (Gur-Ze'ev, 2005), in ways that challenge stereotypes and affective positions toward dialogical participation. For the case of little Marram, a Pakistani girl aged 5 years, we analyze how the chance she is given to express out in her mother-tongue the number words, offers a chance to explore her position in the class. It helps us understand complexity throughout actions in the classroom, the family and the school community. Our analysis searches for opportunities to access mathematical knowledge, identity-work and subjectivity that place learners into positions of participation in the classroom. Some opportunities, from Marram's position as a Pakistani girl in a mathematics lesson, are examined.

Educators and researchers who are, like us, interested in focusing on the complexity of the social, cultural and political contexts of mathematics classrooms face the challenge to develop tools and interventions in order to analyze, discuss and re-configure issues connected to relationships amongst authority, knowledge, identity-work and subjectivity. In our research contexts, we draw on critical approaches for mathematics teaching and learning in multilingual classrooms where children are taught the norm of school knowledge while they co-configure mathematical subjectivities as part of broader social requirements for identity-work as learners of mathematics (Chronaki, 2009, 2011; Planas, 2011). Below, the methodology of the study is outlined and the data analysis is organized around three sections.

METHODOLOGY: CRITICAL, COLLABORATIVE AND EXPERIMENTAL ETHNOGRAPHY

The reported work is situated in the qualitative tradition of educational research, and more specifically in the context of critical, collaborative and experimental ethnography. This study is critical in the sense that it intends to critique what is taken as 'reality' in the mathematics classroom, to disrupt taken for granted 'truths' about who is the competent learner and what is valuable mathematics, to trouble discourses that tend to support the construction of hegemonic interpretations and, also, to imagine how things could have differently happened (Thomas, 1993; Skovsmose, 2014). It is a collaborative study in that it emerges from the need of dialogue amongst participants. The project was held in close collaboration with children and their parents who contributed with information concerning their own ways of using language for number words and counting (Lassiter, 2005). It was, also, organized as a teaching experiment in collaboration with the classroom teacher as it aimed to expand the formal mathematics curriculum on counting and to provide links with children's funds of knowledge. Children coming from different ethnic minorities could perform early number activity (e.g. counting, related number word and number symbol in both oral and written genres) in their mother tongue and share number knowledge amongst them. Multiple perspectives of an issue were discussed, debates were constructed and all these helped data interpretation and inference of conclusions.

The methodology is experimental in the sense that the research process was organized as a series of interactive events in a teaching experiment on number that took place for two weeks during the school year 2011–2012 in a class of a public nursery school in Athens. The experiment encountered the urge to teach number in relation to opportunities for intercultural education as has been required by reforms of the Greek curriculum (Department of Education, 2011). The successive arrangement of the teaching experiment covers the sections on which the Greek curriculum focuses on number and aims to investigate its conduction in a multilingual classroom in order to achieve intercultural contact, mathematical participation and the subversion of stereotypes concerning curricular contents and who is capable of expressing opinions about mathematics and of arrogating mathematics as a cultural or symbolic commodity. Specific material was devised as seen in Table 3, but also Tables 1 and 2. During the implementation phase, the teacher was allowed to modify parts of the interventions, while one of the researchers in the team was integrated as an active participant and internal observer in the classroom.

Participants were the twenty children of the class, seven of whom had not Greek nationality at the time of the study, their parents and the classroom teacher. The home languages of these children were Albanian, Russian, Armenian, Filipino, Turkish and Urdu. Many of them had been born in Greece and their parents are either economic immigrants or political refugees. Marram came from Pakistan and her first language is Urdu although her mother uses English as a means of communication as well. In what follows, we will focus on an event when little Marram is encouraged to speak out loud the number words in Urdu. This event points to a number of difficulties, dilemmas, challenges and achievements of Marram, in a situation of struggle amongst local and globalized discourses about school mathematics, girls, and ordinary languages. Pereen (2007) based on Brandist (2002, p. 179) explains that for Bakhtin 'personal identity' transforms into 'an intersubjective dynamic' that is continually renewing itself. Subjectivity, instead of personal identity, is captured in terms of 'being-as-event' in Bakhtin's words and as such it needs to be conceived as situated in the ongoing eventness of everyday practices in the school classroom.

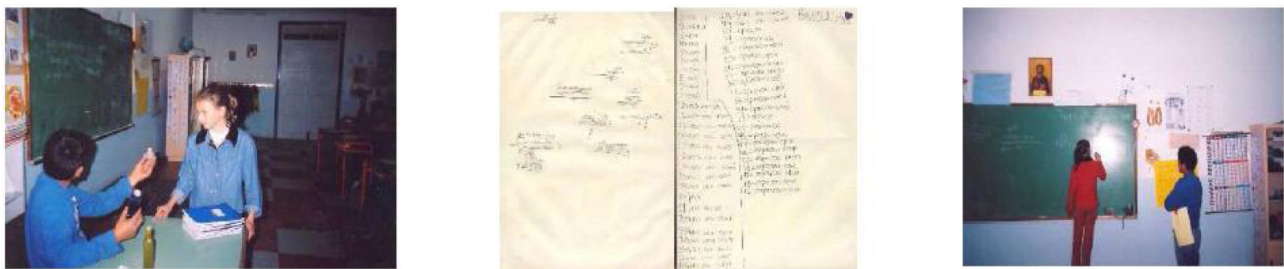


Table 1: Romany and Greek number words (Chronaki, 2009, 2011)



Table 2: A playful outdoor activity on number (Chronaki & Mountzouri, 2009)

DIVERSITY OF NUMBER WORDS: GETTING TO KNOW THE ‘OTHER’

The project *Number words in ‘other’ languages* is part of our attempts during the last years to approach mother-tongue use in classroom mathematical activity as interlinked with learning, identity-work and dialogicality. In Chronaki (2009, 2011), and Chronaki and Mountzouri (2009) we have discussed this perspective first as part of project work in a primary classroom with Roma and non-Roma students (Table 1) and then as playful outdoor activity based on the explorative use of the languages of Greek, Romany and Arabic (Table 2).

The experiment presented here expands into seven languages so that to include all children in the lesson whilst focusing on number counting through number words. A board with number words in all languages was prepared (Table 3).

Children were asked to read words on the board in collaboration with the teacher in whatever manner was feasible for them providing their competence. Although children were familiar with reading, reading and interpreting numbers was a collaborative process with all children involved with teacher’s help. Children recognized number digits from 0 to 10 in the vertical axis and country names in the horizontal axis. It was aimed to have all children watching the number words in each of the spoken languages and making comparisons based on both oral sounds and visual stimuli. In parallel, children had the chance to spot specific countries on a given world map. Later, children were asked to refer to the board (Table 3) and speak out the numbers in their mother-tongue. After some discussion they arrived at questions and conclusions like: Which number words are common in languages other than Greek? (0 was linked to all three languages) Which ones have a similar sound? (tre-tree-treea and u-do) Which ones do we use today in Greek? (dort, dortia as used in the dice).

	Ελληνικά	Αλβανικά	Παστουνοικά	Ρωσικά	Αρμενικά	Τουρκικά	Αγγλικά
0	μηδέν	ζέρο	σιφρ	ноль	ζέρο	σιφρ	ζέρο
1	ένα	νέ	εκ	один	μικ	μπιρ	ισας
2	δύο	ντου	ντο	ντβ	γιέγκκαύ	κί	νταλταύ
3	τρία	τρε	τιν	три	γιέρέκ	αύς	τατλό
4	τέσσερα	κάτερ	ισάρι	ταστίρι	τασας	ντορι	σισοτ
5	πέντε	πέσε	πιανίς	πικτ	χιικ	μπας	λίμα
6	έξι	γικιστε	τοσε	σισοτ	βις	ακί	ανίμ
7	επτά	σιτάτε	σισάτ	σεμ	γισοτ	γιεννί	πιτό
8	οκτώ	τέτε	σιτ	βασέμ	σιτ	σεκίς	αυκατό
9	εννιά	νέντε	νέ	ντεβιότ	ν	ντακούς	σιμ
10	δέκα	δέτε	ντος	ντασισοτ	τάς	αν	σαφισοτ

	Ελληνικά	Αλβανικά	Παστουνοικά	Ρωσικά	Αρμενικά	Τουρκικά	Αγγλικά
0	μηδέν	ζέρο	σιφρ	ноль	ζέρο	σιφρ	ζέρο
1	ένα	νέ	εκ	один	μικ	μπιρ	ισας
2	δύο	ντου	ντο	ντβ	γιέγκκαύ	κί	νταλταύ
3	τρία	τρε	τιν	три	γιέρέκ	αύς	τατλό
4	τέσσερα	κάτερ	ισάρι	ταστίρι	τασας	ντορι	σισοτ
5	πέντε	πέσε	πιανίς	πικτ	χιικ	μπας	λίμα
6	έξι	γικιστε	τοσε	σισοτ	βις	ακί	ανίμ
7	επτά	σιτάτε	σισάτ	σεμ	γισοτ	γιεννί	πιτό
8	οκτώ	τέτε	σιτ	βασέμ	σιτ	σεκίς	αυκατό
9	εννιά	νέντε	νέ	ντεβιότ	ν	ντακούς	σιμ
10	δέκα	δέτε	ντος	ντασισοτ	τάς	αν	σαφισοτ

Table 3: Reference material for ‘number words in ‘other’ languages’

NUMBERS IN MY LANGUAGE?! INTEREST AND EMBARRASSMENT

Most children experienced both interest and embarrassment when they were asked to rehearse counting in their mother tongue. Children from ethnic minorities had experienced 'mother tongue' as forbidden in the monolingual school context where Greek is the only language of instruction. In the case of little Marram, although shyness predominates, the co-presence of interest and embarrassment was evident, as can be seen in the event below, and provided the opportunity to discuss parts of how her mathematical subjectivity evolves (Episodes 1 and 2).

Episode 1. First steps into oral counting in Urdu

Researcher: Which child in our classroom is from Pakistan?

Christina: (raises her hand smiling) Marram!

Researcher: Marram, come here! Marram, I would like you to tell us numbers in Pakistani (*invites her to stand in the centre of the circle; she uses the word Pakistani because children know that Marram comes from Pakistan*). I am asking her in English because possibly she cannot understand in Greek. (*to Marram*) I want you to tell us the numbers in Urdu (*Marram smiles, touches her cheeks with her hands, twirls a lock of her hair but does not answer*). Let's do this, sifr, ek... sifr, ek... I'm gonna help you, sifr, ek, do, let's go!

Episode 2. Marram's oral counting in Urdu

Researcher: She has told us before. Do you remember it? Come on! Come on, Marram! Sifr...

Marram: Sifr, ek, do, tin, char, panch, che, saat, at, no, das... (*counting fast; when she finishes she covers her eyes with her hands [Figure 1]*)

Researcher: Well done! But I want you to do it slower. Slowly, okay? Let's do this! You will do this as so: sifr, ek, do...

Arian: Sifr. (*Arian from Albania reminds her the word for zero*)

Researcher: Let's do this! Sifr...

Marram: Sifr, ek, do, tin, char, panch, che, saat, at, no, das. (*slowly*)

Researcher: Well done! Please, applaud her! Well done Marram, thank you!

Attempting to interpret Marram's position in the above two episodes, we denoted at least two significant issues that determine how her subjectivity becomes reconfigured as part of this specific activity and mediate her efforts towards performing counting; shyness and the use of English language. Both of these issues are discussed below.

Being shy: A gendered position for Marram?

Marram showed shyness and intense embarrassment when asked to express loudly the numbers in Urdu -her mother tongue. Embarrassment or shyness are, often, embodied through a variety of facial expressions and awkward body (especially hand) movement. They are also linked to reluctance of taking an initiative attributing thus a weak, passive or idle subjectivity. However, in the words of Marram's mother, shyness needs to be also considered as a 'female' feature of virtue in Pakistan and its expression is something not only normal but highly desirable for young girls. During an interview with Marram's mother and whilst discussing the significance of the above episodes, she explains:

"Women in Pakistan, we are shy, it's our nature, in our culture. Even here, most people do not know the meaning of shyness... Many children in countries like ours feel shy and do not often participate in every single activity of the classroom. I want my children to make it not only in

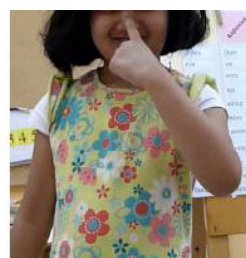
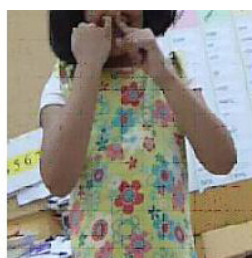


Figure 1: Facial expressions by Marram whilst counting

mathematics but also in all fields.” (Interview with Marram’s mother)

Shyness from the mother’s perspective is a female attribute in Pakistan denoting that young girls grow into women and they become sensible of their femininity. It is performed by women, especially young or non-married. In Pakistan shyness is considered an ethically proper behavior and is linked to virtues like rationality and modesty. Marram’s mother, however, was worried during this part of the interview and asked the interviewer if her daughter was behaving too shy in the classroom. Her concern was based on her fear that Marram’s shyness might not be suitable or compatible with modern cultural norms such as competition, assertion and reclaim. She showed awareness on how Marram’s reluctance could create difficulties for negotiating her position and presence in the public place and believed that her daughter needed to grow confident, assertive and participatory. In Civil, Planas and Quintos (2012) the relevance of considering the family contexts of the learners to better understand some of the classroom events and its participants has been argued. For the case of Marram, the conversations with her mother became crucial for making sense of the girl as participant in the nursery classroom and, specifically, on how she experiences learner subjectivity as she is being caught among various cultures and maybe in the margins of all of them. Civil et al. write about identity issues that immigrant children confront in feeling caught amongst the parents’ culture and the culture in their new country. From this perspective the theme of shyness needs to be interpreted in the case of Marram as a matter of both culture and gender.

English language mediation: What is the status of ‘mother’ tongue?

One can argue how Marram is growing up bilingual as she speaks Urdu at home and understands Greek at school. Talking with her mother, we realized that she needs to be considered as trilingual since she also uses English, mainly with her mother. According to Skourtou (2001), bilingualism refers to the “alternative use of two or more languages from a single person” (p. 199) - a definition that can be expanded to trilingualism. The use of English by the researcher in the class was made to accommodate Marram’s needs and competences. It was a subtle wish by Marram, expressed during initial interviews where she asked the researcher to speak in English. Marram often

switched codes not from Urdu to Greek but from Greek to English and vice-versa. By code switching we mean “the practice of using two or more languages in the same communicative act” (Tsokalidou, 2000, cited in Skourtou, 2001, p. 184). When Marram could not describe something she wanted in Greek, she spontaneously used English in the interviews, but she did not do so in the class where her peers and teacher were present. She might think English was not proper in the lesson with other children who could not understand English.

With respect to this second theme, the family context also plays an important role. For Marram, the use of English is symbolically reinforced by the fact that her mother used to work as an English teacher and was head of an English-learning centre in Pakistan (country in which English is still considered an official language for instruction based on the national curriculum); when she came to Greece, however, she began to work at a wax factory. Her mother values English as ‘international’ language, acknowledging its colonialist influence in Pakistani educational system and its globalized hegemony. She wants Marram to reach better access to English language in order to upgrade socially through her studies and future profession. An important point for the mother is the issue of English language learning in the school context. She stated that the fact that the other teachers of her daughter could not speak English caused her difficulties in the communication with them and was a main reason why she did not often visit them at school. Also, in her words it was an ‘insane’ educational choice, as she argued in one of the interviews:

“English should be spoken at school apart from Greek. But here, at schools there is not an English system. This is bad due to the fact that English is an international language.” (Interview with Marram’s mother)

In the described event, the use of English by the researcher played a significant role in the process of code switching between Greek and Urdu and empowered Marram to participate more fully in the public space of the classroom. More generally and during several classroom events, it was seen that the use of a third language (here, English), which Marram had learnt (and valued highly) from her mother, played an intensively mediating role in this learner’s mathematical participation. Despite Marram knew the number

words in her dominant language, for instance, she needed encouragement in a third language which she could easily use, and with which she feels familiar to express them out loud. Thus, English appears to act as a tool facilitating her public presence in the class. It was not only constant encouragement but particularly the language selected by the researcher at different times that acted positively in her occasional overcoming of shyness to mathematically participate by counting numbers in Urdu.

CONCLUDING REMARKS

In this report, the case of little Marram rehearsing numbers in her mother-tongue has served as an event that exemplifies how mathematics teaching and learning in the school classroom is mediated by participation issues that are not directly concerned with curricular content or with didactic methods. According to our research data (teaching experiment observation and interviews) as well as our interpretation of Marram's case as a whole, it seems necessary to draw on a broader perspective of mathematical subjectivity as related to the complexity of children's participatory experiences, identity-work and learning that is, simultaneously, personally, culturally and socially shaped.

Our study has identified the important role of using multiple languages (Greek, Urdu and English) related to a child's worlds in forming the background of the mathematical experience of a single learner (Marram) through exploring her classroom interaction with an adult who acted as a teacher and who was particularly concerned with the fact of language issues intervening in mathematics teaching and learning. Taking into account that the mediation of English is fundamental in the Pakistani school system, as reported by an informed adult and, in this case, a relative of the child (Marram's mother) secures and increases awareness. The adult's attention to this very fact comes to facilitate the orchestration of English as a tool for the expression of ideas but also for the realization of strategic movements of code switching between languages other than English (Greek and Urdu).

The project *Numbers in 'other' languages* discussed here has forwarded the launching of mathematical ideas of others to all children in a classroom. Such an activity facilitates and bridges the connection of informal knowledge that children acquire through their

family environment or home languages and formal knowledge that is being taught in the school context. In this way, all children's self-confidence is boosted as they are bestowed with the chance to perform their learning abilities, skills or competences as part of their own sociocultural experiences. The above are consistent with a broader perspective of mathematics as a cultural, social and political asset that teachers are willing to accept through various interpretations and ways of expression from children.

A similar project can be potentially implemented using not only language but also artifacts, objects or materials related to mathematics and emanated from 'other' cultures and social practices. Presmeg (1999) mentions that the use of objects originated from the specific cultural positions they come from, facilitates the connection amongst mathematics in school and society. Although the perils of exoticization, mysticism and idolization of mathematical knowledge still lurk, and dilemmas, challenges regarding learning process are many, their inclusion in pedagogical design continues to be necessary and important to explore further. The present team of researchers shares a mutual understanding of these emerging themes being fundamental for interpreting Marram's experience and accounting the complexity and multiplicity of mathematical subjectivity in modern times. The first theme –being shy– deals with the emotional and affective dimension of the learner and reveals how far she has progressed throughout the discursive practices of school mathematics in order to speak out the numerical sequence in Urdu. The second theme –mediation of English in code switching– deals with the communicative dimension of the participants in the lessons and reveals the role and use of language diversity and language hierarchies in mathematics teaching and learning.

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