DE GRUYTER OPEN

DOI 10.1515/jped-2017-0010 JoP 8 (2): 77 – 99

Word problems and make-believe: Using frame analysis and ethnomethodology to explore aspects of the culture of schooling

Luciana Benincasa

Abstract: The paper applies Goffman's frame analysis and ethnomethodology to student performance on mathematical word problems. In educational research, frame analysis has usually been limited to primary frames. Instead, in this paper I focus on the kind of secondary frame that Goffman calls 'utilitarian make-believe'. The data consist of a fragment of verbal interaction between a teacher and a 12-year-old pupil during an oral mathematics exam. By evoking the idea of 'as-ifness', word problems introduce pupils to a make-believe world. The text consists only of 'filler words' because what really matters are the figures. Word problems and possibly other aspects of schooling can be interpreted in terms of a utilitarian make-believe key. Readiness to adopt this make-believe frame when required may be the difference between school success and failure. I argue that maths achievement takes more than just 'being good with numbers'. It is a joint enterprise of people interacting within a culturally-shaped setting, organized so as to make some phenomena stand out rather than others. Finally, I argue that 'word problems and possibly other 'school genres' could be added to the list of utilitarian make-believe frames provided by Goffman.

Keywords: frame analysis, utilitarian make-believe, 'as-ifness', culture of schooling, mathematics word problems, ethnomethodology.

Introduction

Background

(1) Teacher: *Now, Kostas, let us say that you go to the coffee shop with your grandfather.*
(2) Kostas: *My grandfather is dead.*
(3) Teacher: *Well, let's say then that you go there with your grandmother. You order two skewers.*
(4) Kostas: *I never order two skewers. I usually order one.*
(5) Teacher: *Well, this time let's say that you order two. Each skewer costs 200 drachmas.*
(6) Kostas: *Oh, no, a skewer doesn't cost that much. In my village it only costs 180 drachmas.*

The above dialogue refers to an interaction that took place in 2000 between a mathematics teacher and a 12-year-old lower secondary school pupil. The setting was a Greek village where people make their living out of farming. The teacher, an acquaintance of mine, reported the dialogue to his colleagues first and, later on, to me. I have reported it as accurately as I can, on the basis of the notes I took at the time.

This event could have been left in the shadow, forgotten and never going beyond the classroom. Why did the teacher choose to tell this story? Why did the interaction become a topic of conversation with his colleagues? Why was it reported to me, an outsider? This short exchange was probably judged to be interesting or funny – or both. When I narrate it to my university students, they usually smile. Why? What is it exactly that causes them to smile?

For a long time I have felt that the event reveals something interesting about the culture of mathematics and possibly the culture of schooling and the learning that may or may not take place in school classrooms. In the present paper, I shall try to delve deeper into this 'something'. Maths competence is usually associated with 'being good with numbers' (e.g. Griffin, 2003). In this paper I attempt to go beyond such taken-for-granted assumptions. Adopting a microsociological, ethnographic perspective, I argue that maths competence actually presupposes much more than standardized tests can measure. It involves a situational/interactional level that standard maths assessment procedures cannot adequately capture.

The culture of schooling

According to Goodenough's classical definition, culture is

> whatever it is one has to know or believe in order to operate in a manner acceptable to its members, and to do so in any role that they accept for any one of themselves. That knowledge is socially acquired; the necessary behaviours are learned and do not come from any kind of genetic endowment. Culture, therefore, is the 'know-how' that a person must possess to get through the task of daily living. (in Wardhaugh, 2011, p. 229)

Cultural practices *embody* cultural knowledge, for example meanings, values, ideas and understandings. Upon entering school, children are exposed to the 'culture of schooling' and acquire the 'grammar' of school interaction that embodies the social order in the classroom. They are called upon to learn the unspoken 'rules' of school social life, master ways to participate in interactions, acquire fluency and readiness to respond to the most bizarre routines (Rogoff et al., 2005, p. 26).

Knowledge about this 'grammar of interaction' is tacit to a large extent. So is the process of acquisition: 'The organization of practices and routines in which children participate and the ways their participation is supported by others are often "invisible"; that is, they are not made explicit by or for community members' (Rogoff et al., 2005, p. 3). In class discussions, for example, turn taking follows implicit patterns. The underlying rules and expectations must be inferred by students from information that is not communicated directly. On the other hand, there is evidence that the ability to both interpret tacit aspects of that culture and take them into account is important for successful participation in schooling (Mehan, 1984).

Aims and objectives

The event shows a conflict between Kostas's assumptions on the one hand and the teacher's on the other hand. What assumptions does each of them bring to the interaction? What is it that Kostas is supposed to know (and apparently does not know)? These questions, which fall within the scope of the ethnography of communication, could be rephrased as follows: What does Kostas need to know in order to be seen as a successful participant in the school community? (Goodenough, 1956, quoted in Mehan, 1984). What does he take for granted? More generally, what are students supposed to

know or learn that is not explicitly taught? What does this interaction tell us about the culture of schooling? Against the background of these questions, in the present paper I discuss aspects of the culture of schooling through Goffman's frame analysis and ethnomethodology.

The paper then continues with a discussion of academic mathematics and particularly one of its central ideas, which I call 'as-ifness, and some of its pathologies. The conceptual framework is then presented, consisting of two micro-sociological approaches, namely frame analysis and ethnomethodology. These provide the main directions for discussion and interpretation. The former leads to issues of framing and misframing; the latter provides the concept of repair. The heart of the paper consists of three different perspectives on the misframing documented in the sequence under study. At first, a cognitive stance is adopted, but only to discuss its inadequacy. This paves the way to the main interpretation, which is carried out from a cultural and ethnomethodological perspective. The point made in the paper is that 'being good at maths' requires much more than just 'being good with numbers'. Achievement is the joint enterprise of people interacting within a culturally-shaped setting, organized so as to make some phenomena stand out rather than others.

Description and Interpretation: As-ifness

Description

In Goffman's terms, the verbal interaction on which I focus is a strip, that is an 'arbitrary slice or cut from the stream of ongoing activity,' as seen from the perspective of the people involved (Goffman, 1974, p. 10). A strip is a meaningful sequence of action. An exchange between people who talk to each other, such as the dialogue I propose here, is also a strip. I start by describing this strip.

At the end of the school year, Kostas had been found to be weak in mathematics. So, he was asked to study during the summer and take a resit in September, as established by law. Both he and the teacher come to the interaction with a set of presuppositions. Having chosen to test Kostas on simple addition, the teacher starts by framing the setting in which he intends to embed the chosen addition ('*You go to the coffee shop.…*'). Kostas points out that the premises are wrong (lines 1-2). Taking into account the student's objection, the teacher adapts the initial setting ('*Well, let's say*

then...'). Then he adds the figures he has chosen to test the student's addition skills ('*Each skewer costs 200 drachmas*'). Again, the pupil does not recognize the description (i.e. the price) as accurate. The conversation goes on (lines 3-5) with Kostas correcting the teacher once more (lines 5-6).

A first interpretation

I shall try to explicitly state the participants' 'cultural premises,' or their assumptions about the significance and importance of what is going on (Carbaugh, 2007, p. 177). In a school setting, cultural assumptions refer among other things to what counts as knowledge in teacher-student interactions (Urciuoli, n.d.). It is evident that the two participants define the interaction in different ways, but each of them assumes that his definition is shared by their interlocutor. The interaction makes the reciprocal assumptions appear, thus revealing their incompatibility.

The teacher seems to assume a number of things about the pupil's out-of-school life, including that this young boy still has a living grandfather. However, he also assumes that, for the purpose of the oral exam, the word problem need not correspond to reality. Kostas, instead, negotiates the details, trying to reach a satisfactory description. He seems to assume that if his out-of-school life is to be mentioned, then it must be done with accuracy. Unlike the teacher, who is focusing on the figures, Kostas focuses on the setting in which the figures are embedded. At one level, the conflict concerns Kostas's out-of-school life and the teacher's apparent assumptions about it. At another level, the two participants display different assumptions about the 'oral test in mathematics' interaction and its characteristics. Kostas is faced with *academic* (vs. everyday) mathematics. What is special about the culture of academic mathematics? In what follows I start exploring this issue.

Academic mathematics and as-ifness

The mathematics exercise presented in the dialogue is an example of a word problem. In many countries, pupils perform exercises either on operations or on so-called word problems. Traditional word problems have a specific format that has survived and thrived since Babylonian times – for 4,000 years. They are very carefully formulated so that all ambiguities are excluded and they make very clear what is given and what is asked. The accompanying text consists of only a few lines, a few words, some numbers and a question. Most importantly for this paper, 'it must be clear that school

word problems as well as all instances of application of mathematics do not deal with real objects themselves. They deal with *models* of these objects, which are always simplified' (Toom, 2010, p. 25, emphasis in the original). Among other things, all traditional word problems 'describe an imaginary situation, which is intrinsically consistent (that is, does not contradict itself), but does not need to be realistic' (ibid.). Word problems always use 'unrealistic numbers, impractical situations and questions that would never arise in real-life problem situations. (...) Word problems are not about the world we live in; they are about the world of mathematics' (Gerofsky, 1999, pp. 154-156). This type of problem has been viewed as constituting a separate genre with a set of distinguishing traits:

> For example, students learn that the story portion in a word problem is, in many cases, irrelevant, and is used merely to frame the problem. People, places and objects in a word problem could easily be changed to other people, places and objects without changing the underlying mathematical concept addressed in the problem. In fact, an entire word problem could be replaced by a single sentence of the form 'If <*these conditions*> exist, find <*this answer*>.' (Slattery, 2006)

Readers of word problems must think 'as if' something were true (Gerofsky, 1999, p. 41). The teachers surveyed by Gerofsky showed an awareness of the fact that, in formulating word problems, the intent is 'to provide familiar images for abstract mathematical concepts' (p. 119). The same study shows that pupils soon work out the 'rule': 'They [teachers] just wanted to give you a question and they needed to word it somehow' (p. 112). Respondent-students declare that in word problems the stories 'do not matter' (p. 129) and most of the verbal details are just 'so many filler words' (p. 126). As early as primary school, pupils learn that they must 'see through' problem stories and 'abstract the mathematical structures the genre points to' (p. 134).

When I tell my university students about Kostas's trouble with his oral test, they smile. Asked why it is they smile, most of them answer as the participants in Gerofksy's study did (1999, p. 126): Kostas should have known that in a word problem 'stories do not matter'; one has to get rid of all the 'filler words' because what really matters are the figures. The 'rules' that my students, unlike Kostas, take for granted, express an underlying order. Against that order, Kostas's continuous objections are perceived as a breach. It is exactly this breach – this misframing – that makes the underlying order visible.

A few days before, the teacher had asked Kostas to solve a word problem that started like this: 'Your mother and your aunt go to the fields together to till the soil. How long will it take them…' And here Kostas interrupted the teacher to make it clear that his mother and his aunt were on bad terms and would never go to work in the fields together. Behaviours like Kostas's may be perceived as troublesome (by the teacher) or funny (by outsiders). However, from the point of view of the researcher, troublesome events are useful. Challenging existing conceptions of order, they are 'revelatory of the ordinary practices whereby stability is achieved' (Maynard & Kardash, 2007, p. 1484). They help catch a glimpse of the 'system'.

The 'as-ifness' assumption embedded in word problems is part of the 'culture of school mathematics.' Mehan discusses how classroom communication follows a cultural code, the mastery of which is important for school success and status attainment (Mehan, 1984). Recognizing the contexts in which the 'as-ifness' rule applies is part of the competence that children are expected to acquire in the process of 'becoming pupils.' The rules of the game called 'schooling' and the requirements relevant to teacher and pupil roles are transmitted in tacit ways. However, they are mastered by most children in the first years of schooling.

As-ifness, role playing and their pathologies

The concept of 'as-ifness' leads us to the concept of role playing. Role playing is a technique used in research, therapy, education and the training of professionals, for example medical doctors. In school it may be used for understanding and the practice of foreign languages, literature, history, and even science. In role play, subjects are asked to act 'as-if' they were engaged in the specified social context. Events and relationships assume the character of 'as-ifness' (Yardley, 1984, p. 116; Yardley-Matwiejczuk, 1997, p. 77). In foreign language teaching and 'pair work exercises,' role play is explicit and elicited by instructors. Teachers assign roles and students know that they are called upon to enter a world of as-ifness (e.g. '*Pretend that you are* at a party and you don't know the other guests. Practice introductions, asking, etc.'). This type of role play is simulation *labelled* as such. Other school contexts, though, may require pupils to role play without it being labelled accordingly. Regardless of whether an exchange is labelled or unlabelled, it is assumed children understand *when* they are meant to act 'as-if.' They are expected to learn this in the way people acquire a large part of the cultural knowledge of their group, that is, by participating in everyday (school) interactions. Kostas shows that when the 'as-ifness' is not explicitly

indicated, participants may fail to realize that they are expected to role-play. In this case, a *pathology of communication* may develop that is analogous to the schizophrenia that develops in individuals (Harries-Jones, 1995, p. 143). From this point of view, the communication between Kostas and the teacher can be considered pathologic (or schizophrenic).

The idea of 'as-ifness,' as used in this paper, can be viewed as a kind of frame. In the context of school mathematics, word problems require the adoption of a kind of make-believe frame. Word problems describe real life situations by casting them into mere models upon which to operate transformations (Goffman, 1974, p. 560).

Conceptual Framework

Goffman's frame analysis

In the debate over the *primacy* of *structure* or *agency* in shaping human behaviour, Goffman's frame analysis occupies the middle ground. Frames occupy a key position in the interaction between the macro- and micro-level. They represent the structure, that is, cultural conventions that are intersubjectively shared by the members of a community. They focus actors' attention on the relevant aspects of any given interaction and enable participants to come to terms with all its aspects (Goffman, 1974, p. 347). Frames are 'principles of organization which govern events – at least social ones – and our subjective involvement in them' (Goffman, 1974, pp. 10-11). Goffman's perspective is situational (p. 8): faced with any situation the individual, whether implicitly or explicitly, asks, *What is it that's going on here?'* (p. 46). Frames provide answers to that question. In an attempt to work out what exactly is going on, people *frame* events and situations, that is, they attach meaning to them. In addition to operating on this dimension, which we can call cognitive, frames operate at a social level as well because they guide people's action. In Goffman's view, frames do not determine people's actions: they provide a *repertoire* of available courses of action.

The most basic framework, primary frameworks, can be natural (i.e. like the ones adopted for interpreting experiences of physical events) or social. Social frameworks are used for making sense of 'guided doings,' that is, events involving participant's beliefs, intentions, purposes and desires (Goffman, 1974, p. 10). Because people tend to use or adopt more or less institutionalized frames, in a given culture their interpretations of events and situ-

ations tend to be patterned. It follows that frames get reproduced to a large extent. However, they may be partially modified as the actors may (and do) exchange, transform or combine frames (p. 573) and therefore do not act according to conventions.

Secondary frames are the product of the transformation of primary frames for purposes of 'fun, deception, experiment, rehearsal, dream, fantasy, ritual, demonstration, analysis and charity' (p. 560). Goffman calls such transformations 're-framing.' One main way of reframing is *keying*. A key is a 'set of conventions by which a given activity, one already meaningful in terms of some primary framework, is transformed into something patterned on this activity but seen as something quite different by the participants. The process of transcription can be called keying' (pp. 43-44). In a keyed interaction, 'the actions that typically refer to one activity are actually referring to something else' (Creider, 2009, p. 90). Un-keyed (or primary) frames concern real/ actual actions, that is, actions that are literally occurring (e.g. a fight between two men). Conversely, secondary frames concern actions that are 'keyed.' Such actions are perceived (by the competent actor) to be 'not literal or real or literally occurring' (Goffman, 1974, p. 47) (e.g. a fight as a pretend-fight in the context of training for a boxing context). Thus the key 'performs a crucial role in determining what it is we think is really going on' (p. 45). Goffman discusses five main keys relating to frameworks. One of them is 'contest', as in the boxing example. Another key is 'make-believe', which usually finds application in pastimes or entertainment and can range from playfulness to daydreaming, to dramatic scripts, novels and films, dream and demonstration.

A third key, 'technical redoings' includes the 'utilitarian make-believe' variety, which is particularly relevant here. While this key shares common characteristics with the 'make believe' key described above, the adjective 'utilitarian' points to its peculiar features. It concerns social interactions meant to make the neophyte practice, with the goal of developing a certain skill (p. 59). Like mock trials or exercises, these interactions are performed outside their usual context and 'no actual engagement with the world is allowed' (p. 59). For example, in the case of mouth-to-mouth resuscitation the trainee will practice either on someone pretending to be sick or on a dummy, so that any mistakes made will have no real world consequences. Interactions keyed as 'utilitarian make-believe' may require controllers to 'periodically reestablish and redirect what it is that is "happening"' (p. 61). In educational settings, the teacher normally acts as the controller. Employed in a German study in educational settings, the concept has been used to

document how, by transforming all activities into issues of practicing and learning, school settings are 'utilitarian make-believe' situations par excellence (Müller, 2016).

Misframing may occur with both primary and secondary frames, for example when the interactants interpret a situation in the wrong way. In Goffman's terms, such events 'break' the frame, causing bewilderment, chagrin (1974, p. 347) and more serious disruption (p. 346), as the 'break' upsets the underlying 'order.' Though context provides information as to which frame applies each time, an equally crucial feature is the interpreters' cultural and communicative competence. Otherwise, when such conditions are lacking, one participant's words may be a source of misframing for the other (p. 496). The concepts of framing, re-framing and misframing apply also to verbal interactions. Talk 'is like a structural midden, a refuse heap in which bits and oddments of all the ways of framing activity in the culture are to be found' (Goffman, 1974, p. 499).

Goffman's polyedric work has been widely used in education research. In particular, frame theory has been applied to a variety of education levels, settings and research problems. Most studies have been limited to primary frames and only a few use the concept of keying (e.g. Credier, 2009; Lynxwiler, 1999) but ignore the phenomenon of misframing. The present paper is meant to partly fill the gap by (a) focusing on a secondary frame and (b) suggesting that the actors' talk be interpreted in terms of keying and misframing.

Ethnomethodology: Breakdowns and repairs

Like frame analysis, ethnomethodology may be considered a micro-sociological approach aimed at 'interpreting individual activity in relation to each-other in small units' (Verhoeven, 1985, p. 87). Both frame-analysis and ethnomethodology focus on face-to-face relations as ongoing social reality in order to gain insights into the structure and meaningful organization of social life. Both are interested in the process of 'meaning establishment and interpretation' and the emergent character of social order (Verhoeven, 1985, p. 98). Both attempt to understand 'what happens when an individual wonders what is going on' (ibid.). Compared to other micro-sociological approaches, ethnomethodology 'pays much attention to the meaning of concepts in relation to the social setting' (ibid.), offering a peculiar perspective on social order, its origins and maintenance. Social order is the achievement of people acting in concert within local situations, negotiating and making

orderly sense of their cultures. The focus is on commonsense knowledge and on ethno-methods, that is, the shared methods and procedures that people creatively use to make sense of others' talk and action and maintain a sense of shared order and organization (Garfinkel, 1967).

Ethnomethodology has been used in the study of conversation and class interaction (e.g. Schegloff, Jefferson, & Sacks, 1977; McHoul, 1978; Mehan, 1993; Macbeth, 2004). In such studies, classrooms are treated as 'local cultures of knowledge production, honouring and honing some kinds of knowledge and competence and not others' (Macbeth, 2004, p. 704). According to Hugh Mehan, 'the culture of the classroom... is similar to other culturally based activities, in that it is guided by rules or norms established by convention, which means these rules are implicitly taught, tacitly agreed upon, and cooperatively maintained' (Mehan, 1998, see also Mehan, 1993). Ethomethodology is concerned with explicating the implicit rules of classroom culture. Challenging commonsense knowledge about classroom work, it uncovers those 'a priori assumptions that ground and govern educational thought and practice' (Baker, 1977, p. 46).

Talk is treated as a systematically organized social activity and speakers as competent participants provided with conversational-analytical skills (Baker, 1997 p. 48). Each participant in the interaction analyses prior utterances and shapes their own turn accordingly. Their utterance reveals how they analysed the previous turn. Thus, '[w]hat speakers show they find relevant becomes an important basis for studying the collaborative construction of meaning' (Keating, 1993, p. 411). The 'rules' that govern social order are indexical, incomplete and ambiguous. A participant's performance may thus be the source of disturbance to others (Amerine & Bilmes, 1988, p. 328), exposing the inherent fragility of the social order. As problems in communication are systematically addressed and 'repaired' (Schegloff, Jefferson, & Sacks, 1977), order and normality are restored. These cases of breakdown and 'repair' provide important information for understanding social organization (Amerine & Bilmes, 1988, p. 328). The study of classroom interaction has revealed 'unspoken classroom rules and previously unnoticed norms for classroom behaviour' (Mehan, 1998), throwing light on the organization of classroom talk and interaction. Some of its characteristics concern (a) the 'differential participation rights' of interactants (e.g. teacher vs. student) (McHoul, 1978, p. 183), (b) the prototypical teacher-student exchange, which consists of the three-turn initiation-response-evaluation (IRE) sequence and (c) the characteristics of repair, prevalently teacher-initiated and used as a tool for socializing the not-yet-competent (Macbeth, 2004, p. 708; Ozemir, 2009).

Discussion

'As-ifness' as a make-believe frame

The idea of 'as-ifness' can be viewed as a kind of make-believe frame. For the purpose of teaching/ learning/ testing mathematics, this make-believe key may be further qualified as 'utilitarian'. Having said that, I will occasionally use the term 'make-believe' in place of 'utilitarian make-believe' depending on the context. Creider offers relevant examples from the teaching of French as a foreign language: 'In unkeyed situations, these questions would be asked simply to gather the relevant information. However, because of their context (a beginning French class), the questions' meaning and use are changed' (Creider, 2009, p. 99).

Thus, the teacher's words are 'already meaningful' in accordance with a schema of interpretation (Goffman, 1974, p. 45). For example, they could be part of a conversation about a pupil's family or out-of-school life. The situation and the word problem context, though, provide the teacher with the necessary transformation cues (p. 544). He thus adopts a utilitarian make-believe frame and 'splits himself off from the content of his words' (p. 512). He expects Kostas to recognize the frame and realize that the teacher's words are not to be taken in a serious, real, literal way (p. 512). Theoretically, cues are available to Kostas for him to understand that the literal content of the teacher's words 'is not quite what is at issue' (p. 545).

On the basis of contextual cues and their own cultural competence, participants are expected to attach the 'right' meaning and understand that those words are not really about the pupil's family and out-of-school life – not literally – and should not be taken at face value. It takes the school context and in particular a class/ exam called 'mathematics,' for word problems to make sense. This frame is supported by long-standing, entrenched collective arrangements that do not leave much margin for negotiations. Once the make-believe frame is evoked, the teacher's words are keyed, that is, systematically transformed (Goffman, 1974, p. 45). *Systematically*, in fact the first teacher's sentence is followed by others, in the same 'key.' Participants in a maths class or exam are expected to know that a systematic alteration is involved (p. 45).

I argue that the utilitarian make-believe frame is the key to understanding much of what happens in a mathematics class, and maybe beyond it. In fact, research carried out in Greece (e.g. Liatsou, 2001) and in the USA, at

all levels of the education system (Strong, 2003; Douillard, 2006; Gallagher, 2006; Braud, 2010), shows that the make-believe key is widely applied in composition writing in school (though it is reasonable to expect that the kind of make-believe involved here may have different characteristics). In producing school essays students do not dare express personal opinions: they find it safer to adopt ready-made views (Liatsou, 2001; Konti, 2007). Greek students are expressly instructed to leave any personal judgement aside and endorse the 'generally accepted view' by both school teachers and private coachers (Benincasa, 1997, p.183). Among students it is generally assumed that being successful in composition writing requires entering a make-believe frame, that is, by adopting the 'generally accepted view' *as if* it really were their own. In Greece this phenomenon particularly concerns the admission examinations to higher education. However, since the whole process of schooling is experienced as training for that final exam, so important in a student's life, composition writing follows the same patterns as early as lower-secondary education.

Ethnographic research suggests that the make-believe key is extremely common in school settings. Gershman (2004) focuses on what she finds to be two common school 'as-ifs,' namely (a) 'students acting as if the teacher were the enemy (s/he isn't)' and (b) 'everyone acting as if the important part of school were the lessons (they aren't)' (p. 102). She argues that 'people act as if certain things about the educational experience were true when the evidence to support them is thin.' Classroom observation has revealed a large number of 'inauthentic moments – or to be more accurate, inauthentic hours – inauthentic because so many students and teachers did not seem connected to each other' (p. 99). Teacher and students appear to be performing their roles, that is, doing what is expected of them. But in fact they are *disengaged* (pp. 99-100, emphasis in the original). Gershman adds the following:

> For me as a class observer, it was like watching a group of people move silently around a dance floor to a very long song in their heads. The adult had a slow waltz in his head and the twenty-two teens had a hip-hop in theirs. Neither could hear the other's music. And since they were too polite to point out that their rhythms were mismatched (...), they all *pretended that they were dancing to the same tune.* Furthermore, many parents would prefer the pretense. (...). (Gershman, 2004, p. 102, Emphasis in the original)

Framing, re-framing, misframing (and overframing)

What does it look like when a student has grasped the idea of as-ifness and can choose the expected frame? Pupils' mastery of the make-believe frame is apparent when they engage, without protesting, with the most absurd demands of word problems as if (*as if*) they were absolutely reasonable. It is apparent when students 'successfully' answer the most bizarre questions. What, on the other hand, does it look like when they have not recognized the make-believe frame? This is how a former elementary school teacher reflects on such issues in his diary. Recalling a word problem that an external examiner had set the fifth graders in his school at the end-of-the-year examinations, he focuses on a pupil's reaction that, in some way, is reminiscent of Kostas's:

> 'The floor of a room that is 5 m wide and 4.50 m long is covered with tiles that are one square dm each. The man who has bought the room wants to know how many tiles there are on the whole ……'
> 'Please Sir – asks Martinelli – why does he want to know?' (Mosca, 1968, p. 59)

Students who are culturally competent would not ask such questions. In fact, pupils acquainted with the make-believe frame may go to the other extreme and ignore the text of the problem so effectively that they will provide absurd solutions to the question posed. The so called 'bus problem' (Schoenfeld, 1987, p. 196) and the 'captain's age' problem (Baruk, 1985) are two cases in point. The former reads as follows: 'An army bus holds 36 soldiers. If 1,128 soldiers are being bused to their training site, how many buses are needed?' It is well-known that out of the 45,000 fifteen-year-olds in Schoenfeld's study, only 23% gave the right answer (32), whereas 29% of the pupils answered '31 remainder 12; and 18% answered '31'). It has been observed that the children handled the problem as if they had been asked to divide cakes, instead of soldiers. Once the numbers have been isolated and the operation needed has been chosen, the text is forgotten (D'Amore, 2013).

The 'captain's age' problem has also been widely used in research. When it was administered in Italian schools to pupils aged 9-10, the text was changed slightly to reflect the pupils' everyday reality (a rural area): 'A shepherd has 12 sheep and 6 goats. How old is the shepherd?' When all the children, with no exception, answered '18,' they simply acted according to the 'rules': they ignored the text (D'Amore, 2013, p. 5). In this problem and in the bus problem, the children's behaviour might be viewed as a case of 'overframing.' That

is, they pushed the make-believe frame (the ideas that 'stories do not matter' and that the text is just 'so many filler words') beyond the limit.

A cognitive perspective on misframing

In a famous study with adult learners carried out in the 1930s, Luria (1976) records numerous examples of what I have called misframing. The study focused on issues of perception, reasoning, classification and arithmetic problem-solving among farmers in Uzbekistan. When the farmers who had attended literacy programs were compared to others who had not, it appeared that the two groups continually differed in the way they responded to tasks. This is how Luria describes the reactions of the illiterate individuals: 'Upon hearing conditions that deviated from or contradicted their actual experience, the subjects usually refused flatly to try to solve the problem, declaring that the condition was wrong, that "it isn't like that," or that they couldn't solve such a problem' (Luria, 1976, p. 127). In the interaction that follows, the researcher (R.) asks the farmer (F.) a question in which the stated distances between towns are purposely wrong:

> R.: 'From Shakhimardan to Vuadil it is three hours on foot, while to Fergana it is six hours. How much time does it take to go on foot from Vuadil to Fergana?
> F.: 'No, it's six hours from Vuadil to Shakhimardan. You're wrong... it's far and you wouldn't get there in three hours' (...)
> R.: 'All right, but try and solve the problem. Even if it's wrong, try to figure it out.'
> F.: 'No! How can I solve a problem if it isn't so?!' (Luria, 1976, pp. 129-130)

From Luria's evolutionary perspective, these farmers show a cognitive deficit: they *lack* the skill needed to solve the task. People with little or no school instruction cannot solve 'conditional problems involving formal logical operations' – a capacity that appears after relatively short-term school instruction (Luria, 1976, p. 132). From a cognitive perspective, word problem-solving is a matter of information processing. For Luria, as well as Piaget, it is a question of whether or not they possess the capacities required to process the problem (Kaufman & Kaufman, 2001). From this perspective, one can attribute to Kostas a cognitive deficit that does not allow him to think abstractly. However, research shows that the make-believe mode of thinking, as a skill, is available to children as early as the age of two-and-a-half to three (Knuter, 2007). One issue that is debated is which capacities,

if developed, improve performance. To this question some researchers answer 'logico-mathematical skills' and others 'language comprehension skills' (Dellarosa-Cummins, Kintsch, Reusser, & Weimer, 1988, p. 406). In next section I deal with one more possible answer, that is more in line with the paper and the concepts that 'frame' it.

A cultural perspective on misframing

Arguing against the cognitive deficit perspective, cultural psychologist Michael Cole contends that what is involved is not the acquisition of a new mode of thought but 'changes in the application of previously available modes to the particular problems and contexts of discourse represented by the experimental setting' (Cole, 1976, p. xv). Frames are cultural specific, they differ not only across societies but also across settings within one and the same society. From Cole's cultural perspective, doing arithmetic is a particular context and it may have its own specific culture (Cole, 1976). The difference has 'little to do with education, literacy, socio-economic status and language. It seems to be a cultural phenomenon' (Shweder & Bourne, 1984, p. 187). In a similar vein, Adamson argues that '[p]roblem solving is not simply a matter of internal information processing as cognitive psychology assumes, but rather that problem solving is *mediated* (assisted) by cultural conventions (. . .)' (Adamson, 2005, p. 145).

We could argue that the cues available to Kostas were not enough for him to switch to the make-believe frame. The teacher probably meant to make the task easier by framing the problems in terms he judged to be familiar to the pupil. Thus, he may have mentioned the grandfather so the pupil would feel 'at home.' Kostas, though, may have perceived the setting as confusing: by evoking the 'real world,' the teacher's words seemed to *exclude* the appropriateness of a make-believe frame. The communication must have seemed schizophrenic to the student: on one had the teacher unnecessarily evokes familiar persons and situations from village life. On the other hand, and *at the same time*, he seems to be asking for the scene he is building up to be put aside as irrelevant.

From a microsociological/ethnomethodological perspective, an individual's success in performing specific tasks owes a lot to the situation in which they are called to perform and the interactions in which their efforts are embedded. McDermott and Varenne (1999) carried out a study about Adam, a child whose performance varied most across different settings, namely everyday life, the cooking club, classroom lessons and testing sessions. The

four settings differed greatly as to the school-like constraints they placed on Adam's actions, ranging from 'fairly loose' to extremely demanding (like the testing situation). As a result, they also varied in the degree to which Adam became visible as a problem: from maximum in testing situations to minimum in everyday settings (McDermott & Varenne, 1999). The fact is that schools are 'precisely organized' so that some children stand out as learning disabled. In school organization, moments are put aside for the discovery, description and remediation of certain children who display particular traits' (McDermott, 1993, p. 273). This points to the inadequacy of an approach that takes the child as a unit of analysis. Learning is not an 'individual possession': rather 'learning acquires people' (ibid., p. 277). The same may be said of learning disability and incompetence. As Goffman (1972, p. 3) put it, the issues of learning do not concern so much 'men and their moments. Rather, moments and their men'.

An ethnomethodological perspective on misframing

In the interaction analysed here, the teacher's initiation makes reference to the student's grandfather which the student perceives as a 'trouble source turn'. The student initiates repair but, in so doing, he generates problems for the teacher. The topic chosen by the teacher to introduce the word problem (the student's family life) causes a role inversion. Interpreting the problem-setting as a real reference to his everyday family life, the student feels cast into the position of 'primary knower', which is adopted by the teacher under normal conditions (Lee, 2007). The student feels thus authorized to initiate repair ('My grandfather is dead'). Acting 'on what becomes available within the sequence of interaction' (Lee, 2007, p. 1215), the teacher accepts the request for repair, though he obviously finds it unnecessary. The teacher completes the repair by replacing the wrong item with a new one: 'Well, let's say then that you go there with your grandmother'. This version is still compatible with the word problem setting that he has in mind, and he can move the interaction forwards. Two more repairs are initiated by Kostas. They concern information that, though perceived as 'troublesome' by Kostas, is nonetheless necessary for the teacher to formulate the problem and move the interaction forward. Therefore, the other two repairs are not carried out. Though in theory anything could belong to the class of 'repairables' (Macbeth, 2004, p. 708), context is crucial for determining what can and what cannot be repaired. For example, let us take the utterance '*You order two skewers*': at least two figures are required to test the student's competence in addition. Therefore, this utterance, however troublesome to Kostas, is not a 'repairable' one.

These repair sequences are necessarily a joint enterprise because neither participant has sufficient knowledge to deal alone with the repair. The teacher does not know enough about Kostas's family and out-of-school life. On the other hand, Kostas does not know enough about the organizational rules of the type of interaction known as a 'word problem'. The sequence documents Kostas's ongoing analysis of the 'local contingencies' occasioned by the teacher's first turn of speaking (Macbeth, 2004). Classroom repairs are normally teacher-initiated within the framework of pursuing the 'correct answer'. In this case though, Kostas takes on the role of primary knower in pursuit of a 'correct question'. Though I have referred to Kostas's turns as 'breaches', they are quite different from Garfinkel's breaching experiments. Among other things, Kostas's turns are not a deliberate attempt to disrupt the interaction. In fact, he may never become aware that his repair initiations constitute a breach. Both participants rely on organizational resources to produce the joint correct performance and to fix the piece of the conversation that is the source of trouble (Lee, 2007). The participants are focused on building an agreed-upon basis for continuing with the word problem. However, since 'the parties themselves see repair and correcting differently' (Macbeth, 2004, p. 729), they turn to different sets of organizational rules. After three repair requests, student and teacher seem to agree on what the question should be. If we assume that Kostas has decided to give up on repairing, why has he? He may have realized what the teacher already knew, that is, that the repairs he suggested were not compatible with the needs of the word problem organization and would not allow them to bring the test to an end. It seems likely, though, that Kostas finally gives up due to his sense of the 'differential participation rights' (McHoul, 1978, p. 183) regulating classroom organization: he finally acknowledges the teacher's role as 'primary knower' (Lee, 2007), thus restoring order. Whichever is the case, this time Kostas shows he is competent.

Conclusion

Implications for teaching

The central question in this paper was: What does Kostas need to know in order to be seen as a successful participant in the school community? Based on the discussion developed so far, it appears that Kostas needs to be able to retrieve the utilitarian make-believe frame when it is called for. He needs to expect that, in school, many interactions require entering a make-believe frame. In order to be recognized as culturally competent, it is important not to miss the cues provided by the context.

The initial strip can be read as one in which the two participants interpret their interaction through different frames. The school mathematics context and the word problems through which students practice are often organized in terms of make-believe. The (utilitarian) make-believe key is important to coping with (aspects of) certain school subjects. Research suggests that this frame also regulates school life more broadly (Gershman, 2004). At least to some extent, school success is conditioned by the individual's familiarity with the as-if frame and readiness to adopt it whenever required (Mehan, 1984; Baruk, 1985). In the context of word problems, pupils' knowledge about literal and keyed frames and about their relationship makes a difference. It makes a difference between the Uzbeki farmers who would solve the problems and those who would not because they would refuse to even think about it. It makes a difference between Kostas and the great majority of pupils his age who, in similar situations, are ready to pick the right cultural frame and act accordingly. Adopting the right frame can make the difference between a pass and a fail. Failure to 'see' the label – so to say – can lead to school failure (Baruk, 1985). Mehan similarly argues that 'tacit aspects of classroom cultures seem to be important for student success because interpreting social contexts and interpreting classroom rules seem to be a part of successful participation in the classroom community' (Mehan, 1984, p.178).

What could teachers do? Indications about when to adopt a make-believe frame are often tacit, not covered in the textbooks nor explicitly taught by the teacher. For each type of task, teachers should not take it for granted that all pupils understand this tacit rule: they would be better making sure that this is actually the case. They could also make explicit their expectations and the rules of the game pertaining to the learning situation. When communication becomes 'schizophrenic', the teacher could think about how the pupils' frames clash with her/ his own. For example, Kostas's teacher could have introduced the chosen word problem like this: 'Now we shall *pretend* that you have a grandfather and that skewers cost 200 drachmas.' By explicitly labelling his words as a 'pretend-game,' the teacher would have helped Kostas adopt the right frame. On the other hand, the teacher probably considered that explanation superfluous.

Implications for research

Research could be carried out in other school subjects, at all levels, to spot other possible areas where pupils' difficulties might be due to misframing. This could help teachers to help pupils grasp the principle of make-believe keying, and do it early enough to avoid being labelled incompetent

members of their school communities. As far as the study of classroom talk is concerned, this paper documents student-initiated other-repairs. This is an extremely interesting type of interaction in a school setting, considering that the 'other' is the teacher, normally recognized as the 'primary knower' and 'controller'. It would be worth identifying and studying other similar interactions in educational settings. Concerning frame analysis, 'word problems' and possibly other 'school genres' such as composition writing could be explicitly added to task trials, demonstrations and theatre or wedding rehearsals and the other settings that Goffman characterized as 'utilitarian make-believe'.

Notes

1. 'What is interesting about this beginning French class is that even questions to which the teacher does *not* already know the answer (questions about students' personal lives, for instance) take on the role of a display question' (Creider, 2009, p. 99).
2. The problem appeared in the third NAEP National Assessment of Educational Progress.
3. The problem has been administered more recently at various school levels in Italy, with very similar results. Pupils were allowed to use calculators. Many answered 31.333333, generally those who used a calculator. Others answered 31.3 (periodic) e 31.3, but 'very few felt "authorized" to write 31' (D'Amore, 2013).

References

Adamson, H.D. (2005). *Language minority students in American schools: An education in English*. Mahwah, NJ: Lawrence Erlbaum Associates.

Amerine, R., & Bilmes, J. (1988). Following instructions. *Human Studies*, 11, 327–339.

Baruk, S. (1985). *L'Âge du capitaine: De l'erreur en mathématiques*. Paris: Seuil.

Baker, C. (1997). Ethnomethodological studies of talk in educational settings. In B. Davies, & D. Corson, *Encyclopedia of Language and Education. Vol. III. Oral Discourse and Education* (pp. 43 -52). London: Kluwer.

Benincasa, L. (1997). *A Journey, a struggle, a ritual: Higher education and the entrance examinations in a Greek province town*. PhD Thesis, University of Stockholm, Sweden.

Braud, D. S. (2010). *Radicis: Ideology, argument and composition courses in American colleges*. PhD Thesis, Loyola University, Chicago, IL. Retrieved October 23, 2015, from the Loyola University website: http://ecommons.luc.edu/luc_diss/167

Carbaugh, D. (2007). Cultural discourse analysis: Communication practices and intercultural encounters. *Journal of Intercultural Communication Research*, *36*(3), 167-182.

Cole, M. (1976). Forward. In A. R. Luria: *Cognitive development: Its cultural and social foundations* (pp. xi-xvi). Cambridge, MA: Harvard University Press.
Creider, S. (2009). Frames, footing, and teacher-initiated questions: An analysis of a beginning French class for adults. *APPLE Award Winning Papers in TESOL & AL 9(2). Retrieved March 16, 2014, from the Columbia University website:* http://tesolal.columbia.edu/article/frames-footing-and-teacher-initiated-questions/
D'Amore, B. (2013). *La ricerca in didattica della matematica e la sua applicazione concreta in aula. In: 31st Conference* UMI-CIIM. Salerno, October 17-19. Retrieved March 12, 2014, from the Commissione Italiana per l'Insegnamento della Matematica website: http://www.umi-ciim.it/wp-content/uploads/2013/12/VF_DAmore_Testo--Conferenza-per-Salerno.pdf
Dellarosa-Cummins, D., Kintsch, W., Reusser, K., & Weimer, R. (1988). The role of understanding in solving word problems. *Cognitive Psychology*, *20*, 405-438.
Douillard, K. A. (2006). *Examining the teaching and learning of writing in elementary school*. PhD Thesis, University of California, San Diego, CA.
Gallagher, K. (2006). *Beyond fake writing: The power of choice*. Portland, ME: Stenhouse.
Garfinkel, H. (1967). *Studies in ethnomethodology*. Englewood Cliffs, NJ: Prentice-Hall.
Gerofsky, S. G. (1999). *The word problem as genre in mathematics education*. MA diss. Simon Fraser University, Canada: Faculty of Education.
Gershman, K. W. (2004). *They always test us on things we haven't read: Teen laments and lessons learned*. Lanham, MD: University Press of America.
Goffman, E. (1972/1967). *Interaction ritual: Essays on face-to-face behavior.* London: Penguin
Goffman, E. (1974). *Frame analysis. An essay on the organization of experience.* Cambridge, MA: Harvard University Press.
Goffman, E. (1983). The interaction order. *American Sociological Review*, *48* (1), 1-17.
Griffin S. (2003). The development of math competence in the preschool and early school years: Cognitive foundations and instructional strategies. In J.M. Royer (Ed.), *Mathematical cognition* (pp. 1-32). Greenwich, CT: Information Age Publishing.
Harries-Jones, P. (1995). *A recursive vision: Ecological understanding and Gregory Bateson* (2nd revised ed.). Toronto: University of Toronto Press.
Kaufman, A. S., & Kaufman, N. (Eds.). (2001). *Specific learning disabilities and difficulties in children and adolescents. Psychological assessment and evaluation*. Cambridge University Press: Cambridge.
Keating, E. (1993). Correction/repair as a resource for co-construction of group competence. *Pragmatics*, *3*(4), 411-23.
Konti, M. (2007). Ta themata tis ekthesis ideon stis Panelladikes Eksetasis (1983-2001): Dokimazontas tin gramsiani ennia tou kinou nou [The composition topics at the general examinations (1983-2001): Exploring the Gramscian concept of common sense]. Paper presented at the conference *Antonio Gramsci in the social sciences and in theory today*,
Athens, 30 November-1December. 2007. Retrieved May 2, 2014, from the Panteion University website: http://pandemos.panteion.gr/index.php?op=record&pid=iid:609

Kutner, L. (2007). *Midnight monsters and imaginary companions*. PhD Thesis. *Psych Central*. Retrieved March 14, 2015, from the Psych Central website: http://psychcentral.com/lib/midnight-monsters-and-imaginary-companions/0001270
Lee, Y. A. (2007). Third turn position in teacher talk: Contingency and the work of teaching. *Journal of Pragmatics*, *39*(1), 180–206.
Liatsou, O. (2001). Ekthesi anideon stin triti likeiou [Essay writing without ideas in upper secondary school] *Kiriakatiki Eleftherotipia,* August 05. Retrieved March 12, 2015, from the Netschoolbook website: http://www.netschoolbook.gr/ekthesi.html
Luria, A. R. (1976). *Cognitive development: Its cultural and social foundations*. Cambridge, Mass: Harvard University Press.
Lynxwiler, J. (1999). Frame analysis and the problems of paired course development. Paper presented at the *Learning Communities Conference*, Tampa, FL, March. Retrieved March 2, 2015, from the University of North Carolina website: http://horizon.unc.edu/conferences/lc/papers/11.html
Macbeth, D. (2004). The relevance of repair for classroom correction. *Language in Society*, *33*(5), 703–736.
Maynard, D. W, & Kardash, T. (2007). Ethnomethodology. In G. Ritzer (Ed.), *Encyclopedia of sociology* (pp. 1483-1486). Boston: Blackwell.
McDermott, R.P. (1993). The acquisition of a child by a learning disability. In C. Chaiklin, & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context* (pp. 269 305). New York: Cambridge University Press.
McDermott, R., & Varenne, H. (1999). Adam, Adam, Adam, and Adam: The cultural construction of a learning disability. In H. Varenne, & R. McDermott (Eds.), *Successful failure: The school America builds* (pp. 25-44). Boulder, CO: West-view Press.
McHoul, A. (1978). The organization of turns at formal talk in the classroom. *Language in Society*, *7*(2), 183-213.
Mehan, H. (1984). Language and schooling. *Sociology of Education*, *57*(3), 174-183.
Mehan, H. (1993). Beneath the skin and between the ears: A case study in the politics of representation. In S. Chaiklin, & J. Lave (Eds.), *Understanding practice* (pp. 241 268). Cambridge: Cambridge University Press
Mehan, H. (1998). The study of social interaction in educational settings: Accomplishments and unresolved issues. *Human Development*, *41*(4), 245-269. Retrieved March 09, 2017, from the University of Michigan website: http://www.umich.edu/~psycours/561/mehan.htm
Mosca, G. (1968). *Ricordi di scuola*. Milano: Rizzoli.
Müller, S. M. (2016). *Körperliche Un-Fertigkeiten: Ballett als unendliche Perfektion*. Wilerswist: Velbrueck Gmbh.
Ozemir, O. (2009). Three turn sequences in reading classroom discourse. In M. Edwardes (Ed.), *Proceedings of the BAAL Annual Conference 2008* (pp. 117-122). Newcastle: Newcastle University, Scitsiugnil Press.
Pennington, M. C. (1999). Framing bilingual classroom discourse: Lessons from Hong Kong secondary school English classes. *International Journal of Bilingual Education and Bilingualism, 2*(1), 53-73.
Rogoff, B., Moore, L., Najafi, B., Dexter A., Correa-Chávez, M, & Solís, J. (2005). Children's development of cultural repertoires through participation in everyday routines

and practices. In J. Grusec, & J. P. Hastings (Eds.), *Handbook of socialization* (pp. 490-515). NY: Guilford.
Schegloff, E.A., Jefferson, G., & Sacks, H. (1977). The preference for self-correction in the organization of repair in conversation. *Language*, *53*(2), 361-382.
Schoenfeld, A. H. (1987). What's All the Fuss about Metacognition? In A. H. Schoenfeld (Ed.), *Cognitive science and mathematics education* (pp. 189-215). Hillsdale, NJ: Lawrence Erlbaum Associates.
Shweder, R. A., & Bourne, E. J. (1984). Does the concept of the person vary cross--culturally? In R. Shweder, & R. LeVine (Eds.), *Culture theory: Essays on mind, self, and emotion* (pp. 158-199). New York: Cambridge University Press.
Slattery, S. (2006). A man left Albuquerque heading East: Word problems as genre in mathematics education.' Review of *A man left Albuquerque heading East: Word problems as genre in mathematics education*, by Susan Gerofsky. Retrieved March 19, 2015, from the Mathematical Association of America website: http://www.maa.org/publications/maareviews/a-man-left-albuquerque-heading-east-word problems-as--genre-in-mathematicseducation
Strong, W. (2003). Writing across the hidden curriculum. *The Quarterly*, *25*(1), 2-7 & 38.
Toom, A. (2010). Word problems in Russia and America. Extended version of a talk at the meeting of the Swedish Mathematical Society. June, 2005. Updated version. Retrieved March 22, 2015, from The Universidade Federal de Pernambuco website: http://www.de.ufpe.br/~toom/travel/sweden05/WP-SWEDEN-NEW.pdf
Urciuoli, B.(n.d.). Discourse, culture, and social structure: Some basics. Handout, Retrieved January 22, 2015, from the University of Illinois website: http://www.eui.illinois.edu/resources/methods/reading/documents/Urciuoli_Discourse_Analy is.pdf
Verhoeven, J. (1985). Goffman's frame analysis and modern micro-sociological paradigms. In H.J. Helle, & S.N. Eisenstandt, *Micro-sociological theory: Perspectives on sociological theory. Vol. II* (pp. 71-100). London: SAGE.
Yardley, K.M. (1984). A critique of role play terminology in social psychology experimentation. *British Journal of Social Psychology, 23*(2), 113-120.
Yardley-Matwiejczuk, K. M. (1997). *Role play: Theory and practice*. London: SAGE.
Wardhaugh, R. (2006). *An introduction to sociolinguistics* (5th ed.). Malden, MA: Blackwell.

Author:

Luciana Benincasa, Assoc. Prof.
University of Ioannina
Department of Philosophy, Education and Psychology
Dourouti 45110
Ioannina
Greece
E-mail: lbeninca@uoi.gr, luciana.benincasa@gmail.com