In the short editorial note to the introductory section of this book the editors argued in favour of an emerging research trend in mathematics education called the socio-political perspective. They have briefly mentioned how this trend pays particular attention to the fields of practice and of academic research of mathematics education. My intention in this first chapter is to make a case for the existence and need to attend to such an approach. I explore possible reasons why the adoption of a socio-political perspective to research mathematics education practices, as unfolded in different educational environments, provides fruitful ways of conceiving the phenomena of the teaching and learning of mathematics. These conceptions open possibilities to understand other aspects of those practices and phenomena that other well-established research trends have not substantially considered. I also engage in a ‘meta-reflection’ about the practice of researching mathematics education. I contend that part of the development of a socio-political approach involves posing critical questions to the way in which we as researchers, in our activity, build theories, construct ‘objects’ of study and influence our world with the knowledge that we produce. In other words, I ask questions about the way in which we exercise power with our research in mathematics education.

REVISITING THE CORE OF MATHEMATICS EDUCATION RESEARCH
Mathematics education researchers, through their activity and in their discourse, have provided definitions of their field of study. These definitions start by characterising—and therefore constructing (see Popkewitz, this volume)—the ‘objects’ that form a part of its gaze. Even though it is possible to claim that mathematics education is a ‘new’ discipline or field of academic research, there have been multiple ways of defining its objects of study. There has also been a wide range of ‘lenses’ that researchers have chosen to give an account of those objects. Unity in approach has not characterised the evolution of the field, particularly in recent times. This diversity has raised a number of debates including whether or not mathematics education can in fact be considered a discipline (e.g., the discussion in Working Group 4 in Sierpńska & Kilpatrick, 1998, p. 25), whether there is a search of identity (e.g., Sierpńska & Kilpatrick, 1998) or, if in fact, the field has wide-
spread, multiple identities (e.g., Vithal & Valero, 2003), and whether the various approaches—including the theories and methodologies—represent ‘valuable’ contributions to both the practical and theoretical concerns of the field (e.g., Lesh, 2002). In all these discussions, there has been a constant creation of discourses about what mathematics education research is, as well as what the practices of mathematics education in schools and other spaces are. This means that as researchers, we create the ‘objects’ of our study while we engage in the practice of researching those objects.

This remark is of crucial importance when attempting to define the elements of a research approach in mathematics education—in relation to other possible approaches—because it allows us to see that what we choose to research and the ways in which we carry out that research are constructions determined, among other factors, by who we are and how we choose to engage in academic inquiry. In other words, there are considerable ‘subjective’ and ‘ideological’ grounds—rather than ‘objective’ reasons—to engage in particular ways of conceiving and conducting research in mathematics education. Furthermore, there are many socially, economically and historically grounded reasons for understanding the development of this field of study and its constructions.

When tracing the trajectory of mathematics education research in English speaking countries, many authors have pointed to the origins of the discipline emerging mainly in the intersection of mathematics and psychology (e.g., Kilpatrick, 1992). Even though other fields of study have also played a role in contributing to the core of the field, these two have shown the most prolific developments. This means that the dominant definitions of mathematics education practices and mathematics education research have mainly arisen from the work of mathematicians whose focus has been on mathematics, or of psychologists who have a strong propensity towards learning and cognition. The result of this has been the emergence of definitions of mathematics education as the field of study which ‘investigate[s] and [develops] the teaching of mathematics at all levels including its premises, goals and societal environment’ (Wittmann, 1998, p. 87). Mathematics as ‘an original and natural element of human cognition’ (p. 90) is the starting point of this endeavour. The approaches adhering to this type of definition have spawned a considerable body of knowledge about the teaching and learning of school mathematics—each with its own nuances and assumptions. The focus has been predominantly on how individuals learn (school) mathematics and, in so doing, this research has developed an improved understanding of the ways in which practices in schools may enhance the learning and mathematical thinking capacity of individual students. Today, one only has to attend the many mathematics education conferences throughout the world—whether these are for teachers or researchers—to notice the dominance of this focus. Similarly, surveys of publications including books, journals and conference proceedings strongly support the claim that mathematics education is dominated by these two views of the field (Chassapis, 2002; Gómez, 2000; Skovsmose & Valero, 2002).

When looking at the evolution of the field in relation to the historical time in which it started flourishing—namely, around the middle of the 20th century—, it is not surprising that the association between mathematics and psychology had
supported mathematics education research. If we look at the history of mathematics education, as seen from the USA point of view (see Schoenfeld, 2002, pp. 437-443), we find a relationship between the expansion of different schools in psychology — such as the Gestalt psychology, behaviourism, and constructivism — and the different types of studies and directions that research has taken. It is not implausible to hypothesize that the people who started doing research on different phenomena related to the teaching and learning of mathematics have found it fruitful to borrow theories and research tools from psychology. Such fruitfulness could be seen in the possibility to concentrate on understanding and improving individual learning and achievement, one of the main justifications and characteristics of general educational reforms in the USA since the 1960’s (e.g., Lieberman, 1992); and to focus on mathematical thinking and cognition, one of the banners of mathematics education movements from the time of the New Maths. Some trends of psychological research could have been regarded as the most appropriate to reach educational as well as mathematics-related research aims. It is also worth reminding that in search for academic recognition, mathematics educators could have found in psychology and mathematics good allies to legitimate their work, as Lerman (2000, p. 22) argues: ‘Both the disciplines of mathematics and psychology have high status in universities, and locating mathematics education within either group is seen as vital in some countries in terms of status and therefore funding and respectability’.

Besides the internal reasons for the fruitfulness of this alliance, it could be interesting to look at its possible social significance and ‘functionality’ in relation to broader frames of reasoning. Popkewitz (2002) has argued that the development of a particular kind of schooling and of the educational sciences — including curricular studies and subject-matter didactics such as mathematics education — has to be understood in relation to the consolidation of the modern state, one of whose main concerns is the administration of its citizens:

The school subjects are not merely identifying and organizing academic disciplines of mathematics, science, history, geography, music or art into formats that children learn. If one historically considers the school subjects in the beginning of the 20th century, they installed standards that were to make the child’s conduct legible, easily administrable, and equal. The logic underlying the teaching of mathematics and other curriculum, for example, was less related to the academic discipline than to a romantic, even spiritual hope of the future of a liberal democracy and a fear of deviance engendered in the hope […] Pedagogy was to fabricate the new child who embodied the political principles of action and participation and, to paraphrase curriculum writers of the time, to prevent the barbarians from knocking at the American door. (pp. 37-38)

The role of psychology, more than any other social science, has been essential in the process of making the child ‘administrable’ through (mathematics) education because it has provided tools to name, describe and measure the way in which students are expected to think and behave within particularly socially valued

1 An interesting historical exercise to research the history of the discipline, at least in the USA, could be to analyse the trends of the large number of volumes produced by the National Council of Teachers of Mathematics (NCTM) and track the emerging construction of the objects ‘mathematics education practices’ and ‘mathematics education research’. This is in part what Schoenfeld (2002) does for the early developments at the beginning of the 20th century.
systems of reason. Part of the administration of the child exercised through mathematics education is the reduction of the student—a fully socially-grounded child— to a cognitive subject whose dimensions of interest for the study of mathematics education are her or his mathematical thinking processes. This cognitive subject, which the discourse of mathematics education research construes as a ‘schizomathematics learner’ (Valero, 2002b), embodies the main features that are of interest to mould: reasoning and thinking within the frames of reference of a discipline that has proven to be effective in the development of the type of society in which we live today. Mathematics and school mathematics are strongly linked with dominant systems of reason in the white, Western world. Lerman (2000, p. 21), adopting some of the main claims in Walkerdine (1988), states that mathematics is ‘seen as a marker of general intellectual capacity’, whose symbolic power allows to preserve ‘its gendered and Eurocentric character, creating through its discursive practices the reasoning logical norm’. It is precisely this characteristic what connects mathematics—and mathematics education—to the systems of reason, which constitute founding pillars of the enterprise of modernity, such as the primacy of scientific rationality, objectivism, utilitarianism, progress and even democracy.

The recognition that mathematics and mathematics education have been central to the construction and consolidation of these systems of reason—which go together with systems of production—has helped in sustaining the advance of mathematics education, including the interest in developing effective ways of enhancing educational processes in this subject area. This key role is associated with the construction of ‘myths’ around mathematics education. Dowling (1998) has referred to the myth of participation as the conviction that people are handicapped to participate in society if they do not understand and are not able to use mathematics in a critical way. Just as an illustration of how this myth features in mathematics education research literature, let me draw on the justification that Malloy (2002) offers for the need of developing research and educational practices concerned with ‘democratic access to powerful mathematical ideas’—one of the key notions in English (2002):

> An ideal education in which students have democratic access to powerful mathematical ideas can result in students having the mathematical skills, knowledge, and understanding to become educated citizens who use their political rights to shape their government and their personal futures. They see the power of mathematics and understand that they can use mathematical power to address ills in our society. Education of this sort addresses political aspects of democratic schooling, the social systems of nations, and often has as its focus the social betterment of nations and the world […] The crux of democratic access to mathematics is our understanding and researching new ways to think about mathematics teaching and learning that has a moral commitment to the common good, as well as to individual needs. (Malloy, 2002, p. 17, emphasis in the original)

In this fragment mathematics education is clearly identified as a key element in educating citizens who are competent in dealing with the basic challenges of current societies. Of course, research and practices have to face the facts of underachievement and exclusion of some groups of students because it is desirable that all students—around the world, not only in the USA—acquire the intrinsically good qualities of mathematics education. It is not difficult to find in literature
assertions, such as the one mentioned above, that clearly reveal the almost blind trust of researchers in the intrinsic goodness of mathematics education. To put it in other terms, the discourses of mathematics education have resonated with the discourses of mathematics and psychology, as well as with the discourse of modernity in the construction of a particular research discipline, with particular theories and methods, supporting the constitution of practices in the classroom that fulfil essential social functions, which help in sustaining a certain kind of social organisation.

My intention here is not to deny the contributions of the core of research in mathematics education. From this research, we know much more about how the acquisition of different mathematical ideas by different students in diverse formal and informal educational settings takes place. We also know more about the mathematics curriculum, its planning and implementation in the classroom. We have also gathered significant knowledge about the challenges of assessment, the introduction of information technologies and the creation of more attractive, friendly learning environments for students who otherwise would have ‘suffered’ in the mathematics classroom. We know more about mathematics teachers, their education and their working environments. Research has also shown that all this knowledge has helped in improving the practices of mathematics education in educational institutions. I would not suggest that this research has been misleading or that it has been deliberately used to manipulate and alienate students. Rather, I contend that the kind of discourse that mathematics education research and practices have constructed responds to the conditions of the social space in which it has originated and developed. What has been conceived as the progressive consolidation of a discipline, with a central ‘research problématique’ (see Adda, 1998, referring to Freudenthal’s list of thirteen problems for mathematics education research — in Freudenthal, 1983), cannot be isolated from the social, political and economic frame in which that scientific endeavour has been carried out. Furthermore, I contend that the dominant discourse has been associated to a certain research focus and, therefore, has underplayed other elements that are as significant as individual mathematical cognition to reaching an understanding of mathematics education practices. In what follows I will examine how these alternative approaches have entered the field.

EXAMINING THE SOCIAL TURN IN MATHEMATICS EDUCATION RESEARCH

In more recent times there has been an increasing amount of research with a different emphasis compared to the core of mathematics education research as defined above. In an overview of such research, Lerman (2000) referred to it as the ‘social turn’ in mathematics education and identified it as a trend that clearly appeared in published literature in English by the end of the 1980s. Lerman highlighted the fact that even within the mathematical-psychological mainstream of mathematics education research there was a degree of recognition of some ‘social’ factors such as interaction among cognitive subjects — named ‘social’ interaction in,
for example, constructivist theories—or humanistic and democratic concerns—named ‘social’ concerns—of researchers and teachers. However, the ‘social turn’ does not take on these meanings of the term ‘social’ but adheres to a more ‘essential’ meaning. Lerman defined this social turn as ‘the emergence into the mathematics education research community of theories that see [mathematical] meaning, thinking, and reasoning as products of social activity’ (p. 23). According to Lerman, the ‘real’ social turn occurred with the recontextualisation of sociocultural psychology, of anthropological theories about cognition in practice, and of sociological theories of the construction of learning practices in the social spaces of schooling. This has led to the production of new knowledge within the field of mathematics education. Such knowledge differs fundamentally from the conceptual creations in mainstream mathematics education in the conception of the nature of what it means to learn, think and come to know (school) mathematics. In saying that ‘meaning, thinking, and reasoning [are] products of social activity’ we are moving away from the conception of these ‘objects’ as emerging from and within the mind of decontextualised cognitive subjects—with or without interaction with others. In fact the assertion implies that these ‘objects’—or processes—are constituted in the encounter between contextualised, historically grounded human beings and their activity in particular settings and spaces that are socially structured. In this way (mathematical) meaning, thinking and reasoning emerge from and within this encounter and not from a mental process located somewhere in the ‘head’ of cognitive subjects.

Another element of central importance to the shift from mainstream mathematics education is the advance in the sociology of mathematics and in its formulations of mathematics as a social construction—as opposed to previous philosophies of mathematics, which did not significantly distance the ontology of mathematics from the basic ‘Platonic illusion’ (Rav, 1993, cited in Restivo, 1999). I think it is critical to point out that, even though the ideas of mathematics as a social, changing and fallible activity have been behind a great deal of the developments of mathematics education from, for example, constructivist perspectives, it is within the social turn that there really appears to be a theoretical consistency between a sociologically inspired philosophy of mathematics and mathematics education. Consider, for example, Restivo’s work on the sociology of mathematics (e.g., 1992, 1998, 1999). In his many interactions with mathematics education researchers—such as in the Mathematics Education and Society Conference (see Gates & Cotton, 1998; Matos & Santos, 2000; and Valero & Skovsmose, 2002)—Restivo constantly insists that it is not easy for mathematics educators to leave behind the ‘Platonic illusion’, even though we profess some of the ideas of the social turn. For it seems, in the first place, difficult for mathematics educators to grasp that the ‘social’ transcends interindividual interaction for the construction of both mathematics and school mathematical learning (Restivo, 1998). Interaction among people in the construction of knowledge can well be conceived as talk and dialogue happening in a vacuum. In this case the ‘social’ interaction resembles ‘mental’ interaction—in a traditional psychological sense—because it gets emptied of all its contextual foundation. The ‘social’ encompasses the people, their interactions, their activities in particular social spaces and historical times, the traditions and rituals of entering into those spaces
and the overall structures in which all the former take place. Second, it is difficult for researchers in mathematics education to get rid of the shadow of professional mathematics to comprehend school mathematics as yet another social construction that, given the particular settings in which it is constituted, obeys the rules of practice that are not those of the professional community of mathematicians.

As an example of what the latter criticism means let me examine the recontextualisation that van Oers (1996) undertakes of Vygotskyan cultural-historical psychology to produce some knowledge about school mathematics. Van Oers starts by defining mathematical learning as ‘a process of making sense of mathematics as it is brought to us by cultural history’ (p. 92). This process involves negotiation of the culturally-created meanings of mathematics. A theory of learning should then give an account of how those meanings, which are in the first place negotiated by mathematicians in their socio-cultural activity, are formed by children in the context of the school. The centre of a theory of learning that intends to provide an account of the meaning creation resides in how the teacher—a more competent participant in the process of interaction and negotiation of meaning, that is, a representative of the mathematical culture—can in fact support and direct the students’ acquisition of meaning in desired directions. It is interesting to note how, in van Oers’ formulations, there seems to be a decontextualisation of the social space of the classroom and of, consequently, mathematical learning. The situatedness of the processes of learning seems to blur once it has been stated that the core of ‘culture’ and ‘society’ resides both in the intrinsic nature of mathematics and in the close interaction between students and teachers in the classroom. Once this decontextualisation happens, then the essence of the social and cultural dimension of learning—what would differentiate van Oers’ formulations from, for example, those of a constructivist—is the maintenance of a necessary resemblance between the process of producing mathematics—by mathematicians—and coming to know school mathematics—by students in the classroom. In other terms, it seems that the socio-cultural pillars of this approach to mathematical learning have diluted.

But van Oer’s approach is one among many viewpoints that could be identified as being part of the social turn. As a representative example of this variety, the reader can take a look at Steffe, Nesher, Cobb, Goldin and Greer (1996). In this book there is a section called ‘Sociological and anthropological perspectives on mathematics learning’. In this section there are ten chapters, authored by recognised researchers, in which the main assumptions of their perspectives are presented. The books edited by Atweh, Forgasz and Nebres (2001), Boaler (2000) and Burton (1999) also include some chapters that represent other (related) approaches. Some approaches are closer to cultural psychology—e.g., van Oers (1996)—while other have adopted situated cognition theories—e.g., Forman (1996). Some of these views could be seen as complimentary to the traditional psychological perspectives—such as the work of Cobb and collaborators (e.g., Cobb, 2000) who argue for the coordination of individual and social analysis of learning in the classroom—while some argue in favour of the alternative nature of their theoretical constructions (see Cobb, Jaworski & Presmeg, 1996). Thus, as mentioned in the editorial comment to the introductory section in this book, there are multiple definitions of the ‘social’, even within the social turn.
Within this multiplicity, I see that a socio-political trend, much less represented in terms of published research, is in consolidation within the social perspectives. This trend deserves to be examined and characterised as a line of thought within the social turn.

**SPOTTING THE SOCIO-POLITICAL TREND IN MATHEMATICS EDUCATION RESEARCH**

In his account about the origins of the social turn, based mainly on the consideration of English-language publications, Lerman (2000, p. 24) noted that ‘the receptivity of the mathematics education community to social theories was due more to political concerns that inequalities in society were reinforced and reproduced by differential success in school mathematics, than social theories of learning’ [my emphasis]. Lerman suggests here that some researchers in mathematics education started focusing on the fact that there seemed to be a systematic exclusion of some students from the possibility of engaging in the learning of mathematics. These researchers, in search for understandings of this fact, found support in social theories. It is clear that the ‘political concern’ of some of these people resonated with the new tools that developments in sociology, anthropology and critical education could offer.

This route had already started to be explored by people in other non-English-speaking research traditions. *The politics of mathematics education* (Mellin-Olsen, 1987) was probably the first book in mathematics education in which the term ‘politics’ appeared in the title. Power was central to Mellin-Olsen’s multidisciplinary view of mathematics education. Behind his book and approach there was a tradition of work in Norway and Denmark in which the ‘political dimension’ of mathematics education had been explored and discussed (e.g., Mellin-Olsen, 1977; Skovsmose, 1980, 1981a, 1981b). This Scandinavian tradition, rooted on Action Theory and Critical Theory and drawing theoretical tools from a variety of social sciences, can be considered as a key element when tracing the emergence of the socio-political trend.

**Some key notions**

It is important to examine more carefully how the political concerns of some scholars developed into what could be called a ‘socio-political’ trend in mathematics education research. In other words, it seems relevant to bring some elucidation to the meaning of the terms ‘social’ and ‘political’ in this expression. The ‘social’ component of this term is more or less defined according to the clarifications and essential points that were noted above as being the difference between the social turn and mainstream research in mathematics education. The ‘political’ component, however, has not been clearly defined yet. I would like to contend that even if the social turn derived from a political concern of some researchers, not all the theories and approaches developed as part of the social shift have in reality incorporated an analysis of power in association with mathematics education.
Let me start by a simple definition of the term ‘political’ as awareness of the existence of power. Now let me reiterate, for example, van Oers’ socio-cultural psychology of mathematics learning. Where does a consideration of power appear in van Oers’ theory? A similar question can be asked for all the ten socio-cultural chapters in Steffe et al. (1996). It is possible to argue that ‘power’ appears in association with statements of the type: Since mathematics is a powerful knowledge in our society, then it is important to improve the access of as many students as possible to a quality mathematics education. Such an assertion implies, in other terms, that mathematics and mathematics education empower. That there is empowerment associated with mathematics and mathematics education is sometimes an explicit assumption — see e.g., Cobb & McClain (in press) when justifying the relevance of students’ statistical understanding as a part of their competence as citizens —, but most of the times it remains tacit. It is interesting to highlight that this type of political concern, however, does not differ substantially from the also tacit political concern of psychology-oriented research in mathematics education. Skovsmose and Valero (2001) have argued that much research work seems to adhere to the idea that mathematics is in itself an indispensable, good and desired knowledge in our current (Westernised) world, and that mathematics education has the positive role of enculturating the new generations into that knowledge and all its related values. The unquestioned intrinsic goodness of both mathematics and mathematics education represent the core of its ‘political’ value: If students and citizens come to learn a considerable amount of mathematics properly, they will become per se better people and better citizens; that is, mathematics and its education empower or have the capacity of giving power to people. In other words, there is an intrinsic resonance between mathematics, mathematics education and power. The quotation from Malloy (2002) above illustrates this type of argument.

The problem with this kind of assumption is that there is no necessity for a further examination neither of mathematics as a knowledge and of mathematics education as practices, nor of power. Power, in that form and definition, is taken for granted, and whenever it appears as part of the research discourse or the public discourse about mathematics and mathematics education, then good mathematics and mathematics education practices get vested with a veil of sanctity and redemption of humanity. The acceptance of ideas related to the intrinsic resonance of mathematics, mathematics education and power helps sustaining the alchemy of mathematics as a school subject that can be used very efficiently in the administration of the child — to put in it Popkewitz’ (this volume) terms. Furthermore, there is a fundamental problem with the attribution of power to mathematics in this way. Saying that mathematics is powerful means that mathematics in itself can exert power, what implies that mathematics is given the status of a social agent. Mathematics is given a life of its own that it does not have. It is people, in their activity, who use mathematics as a tool of power. Saying that mathematics is powerful, therefore, leads us to a new kind of Platonism (Valero, 2002a). In this way, the field becomes trapped again in the ‘Platonist illusion’ that the sociologists of mathematics have so fiercely criticised.

What power means in association with mathematics education needs to be carefully examined (see Skovsmose & Valero, 2002; Valero, 2002a). Therefore, it is
important to examine the naïve definition of power presented above, and to bring forward a more complex notion of ‘political’ and of ‘power’. Let me adopt a view of power rooted in the Marxist tradition. From such a perspective, power is the capacity of some — the owners of resources or a dominant class — to mould the living conditions of others — the dispossessed — by alienating them from the produce of their work activity. Such a capacity, rooted in basic forms of production, is reinforced by a whole ideological superstructure, which supports and feeds the maintenance of class divisions. Power, then, is a capacity of some people — or groups of people — to keep others in their condition of excluded. Although this definition, so formulated, may misrepresent the depth of its theoretical lineage, it is important to highlight that its essence is a division and a struggle between those who are ‘included’ and those who are ‘excluded’. This struggle represents a relation in which some tend to win — although there are always spaces for contestation and resistance on the side of the excluded (as Apple, 2000, reminds us).

This conception of power has taken different shapes in mathematics education. A significant representative of this view is the political challenge posed by ethnomathematics to the reign of Western, white mathematics. A fundamental critique by D’Ambrosio (1993, p. 10) is the uncontested imposition of mathematics as ‘a form of logic and rational thinking that became the characteristic feature of the human species’ (my translation). Because of this privileged status in the cultural construction of the Western world — a particular, but universalised rationality —, mathematics ‘is positioned as a promoter of a certain model of exercising power through knowledge’ (p. 24, my translation). In the historical development of the Western world, which has impacted the transformation of the rest of other peoples, mathematics ‘brings the memory of the conqueror, the slaver-owner, in other words, the dominator; it also refers to a form of knowledge that was built by him, the dominator, and that he used and still uses to exercise his dominance’ (D’Ambrosio, 1996, p. 114, my translation). Powell (2002, p. 17) also highlights that ethnomathematics departs from forms of thought that privilege ‘European, male, heterosexual, racist, and capitalistic interests and values’. This critique to mathematics as a tool of power is incorporated into research and into the pedagogical proposals derived from it — see Knijnik (this volume). Bauchspies (1998, 2000, forthcoming) also illustrates the role of mathematics and science education in relation to power structures in classrooms in West Africa.

There are numerous studies approaching the issues of equity in mathematics education on the grounds of students’ race, class, gender and language, among others, which adhere to this definition of power. A significant example is the work of Frankenstein (e.g., 1987, 1995) and her understanding of mathematics education as a critical process in which students realise their conditions within a system of class division through their mathematics education experience. The point being proffered by this branch of mathematics education is not only adopting a critical position towards the contents and the processes of learning, but also towards the role that mathematics and mathematics education play in the very same social conditions of students, as well as in the possibilities of transformation of those conditions.

One element that clearly emerges from this type of definition of power — in association with the use of Critical Theory — is the necessity of questioning both
mathematics and mathematics education practices. Such a questioning leads to an interrogation of ideas such as the intrinsic goodness of mathematical knowledge — e.g. Is it possible to assume that mathematics is a knowledge associated exclusively with progress and the well being of humanity? Or do we need to consider the involvement of that knowledge in the creations of both wonders and horrors in our current technological society? (D’Ambrosio, 1994; Skovsmose, 1994)—, and the intrinsic ‘empowering’ nature of mathematics education — e.g. Can we really trust Malloy (2002) in her view that good mathematics education will in fact make good citizens? Or should we consider the ways in which textbooks, policy makers and even mathematics education researchers build the myth of participation around mathematics education (Dowling, 1998)? In the case of the ethnomathematical program it is clear that any reformulation of mathematics education as social and cultural practices includes an examination of the goods and evils of the uses of mathematics within the social structures in which they emerge. The ‘uses of mathematics’ here do not only refer to the concrete applications of mathematics in the development of technological devices — as Skovsmose (1994) emphasises— but also the ‘functionality’ that people give to it in the construction of social relations and culture. It is also clear that educational practices get constructed around a constant interplay between different types of knowledge — e.g., school mathematics and practice-bound mathematics— and around discussions regarding the legitimacy and strength of each type of knowledge to address a particular situation (see Knijnik, 1996). To summarize, a notion of power rooted in Marxist and Critical traditions highlights the necessity of incorporating critique as an essential element of a socio-political approach. The examination of power requires critique as a means to offer a counterpart to naïve views about the way in which mathematics and mathematics education are implicated in the creation and maintenance of particular social structures.

A third possibility to define power, which moves away from the shortcomings of the two previous definitions, is power as a relational capacity of social actors to position themselves in different situations and through the use of various resources of power. This definition is clearly exposed in Cotton and Hardy (this volume). This definition implies that power is not an intrinsic and permanent characteristic of social actors — as the two previous kinds of definitions may entail—, but power is situational, relational and in constant transformation. This transformation does not happen directly as a consequence of open struggle and resistance, but through the participation of actors in the construction of discourses. In this sense power is subtle; and precisely because of this subtlety it becomes ‘more powerful’. When power is defined in these terms, it becomes possible to perform a very fine grained analysis of how mathematics and mathematics education are used by people in particular discourses and of the effects of those discourses on social practices and, consequently, on people’s lives.

This last way of defining power has not been so popular among mathematics education researchers, probably due to the fact that it is related to more recent postmodern and poststructuralist conceptions of power (e.g., Foucault, 1986). However, this type of definition could stimulate new prolific production in mathematics education research. The reason for this is that such a definition of
power finds resonance not only with the advancement of postmodern ideas in education (e.g., Popkewitz & Brennan, 1998) and in mathematics education—as suggested by Ernest (this volume)—but also with new possibilities of reinterpreting many of the theories that have been at the centre of the social turn. Consider, for example, the ideas of situated cognition and learning as increasing participation in communities of practice in relation to this political viewpoint. It becomes possible to study how power is an essential constituent of mathematics education practices in educational institutions.

Let me exemplify this possibility. Many of the recontextualisations of, for example, Lave’s (1988) ideas in mathematics education research have been a substantial part of the social turn. Viewing learning in terms of participation and belonging to communities of practice is an alternative to a conception of learning as individual mental processes. However, I find that many of these recontextualisations have done away with the socio-political depth of Lave’s notion of situated cognition. One of the central points of Lave’s argument is that the triad person-in-activity, activity and setting—the relationship in which cognition takes place—is dialectically constituted in a multiplicity of contexts that provide meaning to the relationships in the triad. Lave emphasises the fact that that triad—located in what she calls the ‘experienced, lived-in world’—is dialectically constituted in relation with what she calls the ‘constitutive order’—the mutual entailment of culture, conceived as semiotic systems, and organisational principles of the material and social universe (of political economy and social structure) (Lave, 1988, p. 178).

This multi-contextuality and deep political nature of cognition is lost when researchers in mathematics education reduce the notion of setting to, normally, a mathematics classroom. This is also lost when researchers declare the classroom, the students and the teacher to be ‘social beings’, while building a whole discourse throughout the research process, which in fact isolates the classroom from both the social arenas in which it is immersed and from larger contexts. The result is the creation of objects which are given the label ‘socio-cultural’, but which in reality are conceived as objects of analysis that exist in a vacuum. The effect of this is, again, a new kind of ‘Platonisation’ of the social and political practices of mathematics education. A way of highlighting power in mathematics education within Lave’s framework could be to pursue the question that she herself posed to the dominance of traditional cognitive science on the value of decontextualised knowledge: What are the systems of values, that take part in the historical frames in which cognitive science developed, which made such a conception of knowledge ‘dominant’—at the expense of contextualised, derived-from-practice knowing? What is it that makes particular kinds of school mathematics education practices develop in ways that are valued as the ‘right’ way of teaching and learning mathematics? What are the discourses, at different levels, which give teachers and students particular positions in those practices? How do students and teachers change—and in which direction—their participation in those practices, and to the benefit of whose positioning do those changes happen? These new questions could guide us into investigations that reveal the fact that ‘learning mathematics’ is a highly political and social act that needs to be understood in full connection within the multiple contexts in which that activity and practice unfolds.
Finally, one element that emerges strongly when examining the definition of power in terms of positioning is the notion of context. Some critics have qualified mathematics education research as being internalistic, and one of the issues that they cite is its blindness towards the context of learning (e.g., Apple, 1995). Some trends in mathematics education research have paid significant attention to context when identified with the mathematical or real-world association that may trigger cognitive processes—e.g., within constructivist theories of learning. Special thought has also been given to the interaction context—the chances of communicative exchange between teacher and student and among students—in the classroom. However, definitions of context in terms of the situational context—to use Wedege’s (1999) formulation—or even the socio-political context—to use Valero’s (2002a) and Vithal and Valero’s (2003) definition—have been comparatively more limited, but certainly present in studies that could be labelled as socio-political. The socio-political context can be defined as the macro-sociological space that has an influence on the more focalised interactions of mathematical teaching and learning in microcontexts such as the classroom (Valero, 2002a). The notion of socio-political context invites mathematics education research to regard the possibility of analysing mathematics education practices in the interplay between ‘the lived-in-world’ and the ‘constitutive order’—to use Lave’s terms. Paying attention to this context and incorporating it as an essential element of analysis in mathematics education is a way of breaking the internalism of the field of study and its analysis.

It is interesting that the recognition of the role of context in mathematics education has been limited to the description of the ‘context’ of a situation under analysis. This is the case in many research reports where one finds statements such as, for example, ‘the context of this research is a primary school in a low-class area of London’. Such a description seems to support the idea that being aware of the context implies simply mentioning it and, later on, forgetting its existence and its significance for the understanding of the analysis in question. Rather, the central point is finding ways of knitting together the micro contexts on which mathematics education researchers normally concentrate—such as a community of learners in the classroom—with the multiple layers of contexts in which that micro context is inserted, with the aim of finding significant revelations about the social and political essence of the educational practices of mathematics. All chapters in this book provide examples of this. As one illustration I will mention Chronaki’s (this volume) analysis of her experience in studying mathematics education in a cultural setting which is not her own. Her noticing of school norms, uniforms, ways of talking and behaving that may not normally be part of the typical focalised observations of a mathematics education researcher—interested in the learning of mathematics—acquires relevance in the enterprise of the researcher giving meaning to mathematics education in that social setting. Vithal (this volume) also highlights that part of the significance of a pedagogy of dialogue and conflict in a country such as South Africa resides in recognising and including in the analysis the unstable and conflictive nature of social relations in that country. Without these types of considerations, any analysis of mathematics education as a socio-political activity gets in fact depoliticised. The constitutive relation between micro and macro
context, then, is a salient feature of a socio-political approach in mathematics education research.

Summarising, in this section I have examined three possible definitions of power in mathematics education, and I have also pointed to critique and context as associated notions that go hand in hand with power. I also attempted to argue that both critical definitions of power in relation to the role of mathematics and mathematics education in society, and the incorporation of context in mathematics education analysis are some of the most salient characteristics of research within the socio-political trend in mathematics education. In other words, socio-political approaches to research mathematics education are characterized by sensitivity towards and a serious incorporation of power, critique and context as relevant concepts to understand the practices of mathematics teaching and learning. This does not mean, however, that these are the only characteristics. Neither does it mean that there is unity among the research projects adopting a socio-political approach. My claim here is that it is possible to recognise some common concerns that may appear across the multiple particular perspectives that can be labelled socio-political.

Some methodological remarks

A consideration of research methodology is missing in this discussion. One obvious answer to the question ‘What makes a piece of research ‘socio-political’?’ is that both, the theories and the methodologies on which a research relies and develops further, have to be socio-political. I think, however, that this connection is not immediate and that it is not a necessary and sufficient condition for research in mathematics education to be socio-political. Vithal (this volume) draws attention to the necessity of encompassing the theories to illuminate mathematics education practices, with the theories to illuminate methodology, that is, the theoretical foundations of the research process itself. It can well be that a study emerges from a socio-political concern — such as the unequal access of women to significant mathematics education —, but the researcher ends up generating a research process that diverges completely from the initial concern because the researcher’s ways of acting along the process and of substantiating her claims fall within the standards of rationality of the most traditional of mainstream research — e.g., some of the studies on gender reported in Keitel (1998)².

It is my contention here that socio-political research in mathematics education also has the task of constructing alternative discourses about the research process itself. I would like to briefly discuss the issue of visibility of the researcher and the revelation of his/her ‘self’ (Krieger, 1991) as a strategy to break the neutrality of traditional academic discourse, and to contribute to the creation of new ways of communicating research.

Knijnik (this volume) states that

the genre of my writing is to a certain extent different from that of the usual mainstream research texts […] For me, the personalising of the text represents a very political act

because it highlights the fact that knowledge production is not a neutral activity. This personalisation reveals the subjectivity of the researcher, her/his political stance, and the ways of interpreting the world; all of which imprint the topics and the methodologies that the researcher chooses within the research process.

A similar revelation of the self is found in Chronaki (this volume) where she invites us to see how she made sense of the culture of others through a reflection on her own school (mathematical) experiences. Cotton and Hardy (this volume) make clear the multi-vocality of their writing by combining their voices but also separating what each one of them has contributed with in the writing of a common chapter. Meaney (this volume) also makes transparent to the reader the process of negotiation that she lived when working with a Maori community. Gorgorió, Planas and Bishop (this volume) also evidence the multiple tensions that the researchers faced in working with immigrant students in Catalonia.

The revelation of who we are and what we stand for as researchers constitutes a transgression of the established norms of traditional academic discourse. This discourse, based on the idea that knowledge production and research are technical processes in which the ‘knower’ is separated from the ‘known’, and that their main goal is to produce ‘objective’ descriptions, explanations or interpretations that leave the ‘known’ untouched by the ‘knower’, is limited in recognising the role that the knower in fact pays in constructing the known while interacting with it in the process of research. Normally this pretension of objectivity is masked behind the generation of cold, distant, objective formulations behind which the researchers — with all their subjectivity and social groundedness — hide (Valero & Matos, 2000). In making the researcher visible — in ways that are more significant than a politically correct use of a personification of the discourse through the use of the pronouns ‘we’ and ‘I’ — socio-political research may open to the critical examination of the reader the products of the research process, the intentionality of the researcher, and the paths that the researcher decided to take when meeting the people she engaged with in the research.

This visibility is not a matter of the transparency of the methods and of the correctness of their application — as suggested in different criteria of research quality such as those described in, for example, Schoenfeld (2002). It is a matter of evidencing, in the way we express ourselves — our written and oral discourses —, that we recognise the dialogical, political and social nature of our task as researchers in mathematics education, and that we are implicated in constructing part of the practices of mathematics education in educational institutions when we act in those spaces as researchers. In other words, it is being consistent with what Restivo (1999) would call the ‘social construction conjecture’ at the level of our own research endeavour. This characteristic provides an additional answer to the question posed at the beginning of this subsection. Adopting a socio-political approach is not only a matter of choosing a particular set of theories and methodologies. It is an ‘attitude’ that seeks for consistency between the former and our activity as researcher. This attitude also shows that the researcher is in search of appropriate ways for communicating the interpretations of her or his activity.
A PERSPECTIVE IN CONSOLIDATION

In the field of study called mathematics education there have been multiple trends delineated not only by their topic and object of study but also by their theoretical and methodological principles. Although a great deal of research has been done within what may be called a ‘psychology-mathematics oriented’ trend, an increasing amount of research has emerged as part of a ‘social turn’. Within this social turn, there has appeared research adopting a ‘socio-political’ viewpoint.

If it is true that personal ‘political concerns’ of some researchers have been at the root of the development of this type of studies, such political concern has evolved in a more systematic examination of the ways in which power is a defining element of both mathematics education practices and research. Socio-political perspectives in mathematics education research are under consolidation. Researchers adopting these perspectives engage in the critical endeavour of examining not only the nature of the ‘objects’ of mathematics education research, but also the process of doing research, and proposing alternative — and complementary — forms of interpreting, explaining and understanding mathematics education practices.

ACKNOWLEDGEMENTS

I want to thank Mahesh Bhatia, Wenda Bauchspies, Sal Restivo, Ole Skovsmose and Robyn Zevenbergen for their comments to previous versions of this chapter.

REFERENCES

SOCIO-POLITICAL PERSPECTIVES ON MATHEMATICS EDUCATION


Popkewitz, T. (2002). Whose heaven and whose redemption? The alchemy of the mathematics curriculum to save (please check one or all of the following: (a) the economy, (b) democracy, (c) the nation, (d) human rights, (d) the welfare state, (e) the individual). In P. Valero & O. Skovsmose (Eds.), Proceedings of the Third International Mathematics Education and Society Conference, Second edition (pp. 35-56). Copenhagen: Centre for Research in Learning Mathematics.


