

## **The Question of Knowing Others: Doing Research in Mathematics Education**

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### INTRODUCTION

Research, we all know, is a motor for making a difference. Given that understanding, it is no surprise that much of the strategic thinking about educational research has been prompted by the idea of the capacity of research to pose questions about, and to cultivate the means by which, students might be empowered to make the world a better place. We know, too, that the relation between research and progressive social change has a complex history, and the science on which research is based, has played an important role in transforming classroom practice. But so too has politics: politics cannot be left out of the definition of and criteria necessary for valid educational research. Cautionary words, like these have sparked debates on how to accommodate political actuality within the meaning of research. These debates have, however, been conducted largely in negative terms. They tend to ignore the political *potential*, and bring to the fore a whole set of issues about the activity of research as a governed site, constrained more than enabled by various forms of political power. This response opens up for the researcher a contradictory stance, precisely because the researcher attends to both the inwardly directed world of teaching and learning *and* to that which is outwardly directed and which belongs to a culture of profit and competitive edge.

These debates are important because they signal an ill-defined reliance of research upon other domains of knowledge, and the uncertainty, the precariousness, and the compromised practice which this dependency incites. One result of this compromised practice is that 'research' as a category of shared experience has become a vigorously reconceptualised term, inflected by the differences within, as well as between, the specific contexts which organise the relations of power between competing domains of knowledge. 'Qualitative' is a word with which we are all familiar and it would appear to be the best word to designate not a consensus, but a multiplicity of approaches which nevertheless do possess at least a common commitment to modernist principles and values.

My curiosity in this paper is directed towards politics, but not so much as to how research might operate in a context in which the principle of economic utility is firmly upheld, but more towards how we structure our conceptual categories and what political effects they engender. I want to join in a new debate which asks critical questions about truth, representation and interpretation, around two interrelated themes. Firstly, how can conventional forms of qualitative inquiry, in which orthodox notions of truth, representation and interpretation inhere, be reconciled in a postmodern age of rapid communication and uncertainty, and to what extent can these traditions

of critical analysis and inquiry contribute to progressive educational change in the twenty-first century? Secondly, if these traditional forms are taken to be singularly inappropriate, what are the implications of an alternative theoretical framework for the doing of research, and what might an alternative form look like? The fundamental problem is the extent to which a philosophical form of critique which rejects any type of certainty or value judgment conflicts with, or even undermines, education whose ultimate aims of personal autonomy and progressive change necessarily rest of certain basic value judgments and truth claims.

It is against the general background of these debates that I explore exactly what these destabilizing effects might mean for the doing of research in mathematics education. My focus is on the specific challenge to the notion of representation which derives from the general crisis in cultural authority, and the implications of that particular tension for the gathering and analysis of qualitative data. The investigation leads me to consider the potential of this challenge as a source of more sophisticated analytical tools in formulating a research practice. That interest gestures toward a different practice, one which is organised to accommodate doubt and difference - a practice which demands attention to how research stories are told, and the inadequacy, yet necessity, of voice and interpretation. What this suggests for the researcher is a different identity from that which is currently defined - one which signals the difficulties of structuring representation and hence of categorical systems which conceptualize mathematical knowledge, lived experience, classroom structure, and subjectivities. The good news is that this is *not* a discussion about whether a particular piece of research can claim to be objective or not: book-length answers to that question have already been attempted by others. The bad news gestures towards the extraordinary difficulty of telling other people's mathematical stories.

The discussion is in two parts. First, I revisit and reorder some recent research stories in the field within which I have recently been working. I look at some authoritative accounts of girls in mathematics, bringing to these stories my own interests and hence my own interpretations. I look at the kinds of conceptual categories and research identities upon which the recent body of research in this field has seen appropriate to utilise and ask what is it that structures these designations and what their political effects might be. This is a different problematic to those routinely investigated in discussions of research mathematics education. Confronting this problem head-on in the second part allows me to explore the ways in which our research stories structure how we see ourselves and how we see others, and how we have constructed the notion of researcher, in the present and in the past. I do this by taking an unusual step by elaborating how representation is understood and the effectivity of its discursive constitution. But I want to be clear here that this is *not* a relativist issue of recognising different versions of reality, but rather of acknowledging that 'representation' itself is more complex than we have previously understood. It is discursively constructed within power/knowledge relations. In light of this, the question of knowing others becomes much more difficult to answer. My suggestion is that we must read and write research differently, questioning the conceptual categories employed and ask what the political effects of these structuring practices might be.

## RECYCLING REVISIONISTS' RESEARCH

In the 1990s, partly in response to what had already taken place in other avenues of social analysis and criticism, revisionist work in the field began vying for attention over the story of girls in mathematics, claiming that *the girl* is not a passive consumer of mathematics, and that her experiences within everyday school life must be given some recognition. In the qualitative approaches which developed, a distinct interdisciplinary line of inquiry was able to pose questions previously unarticulated by empirical mathematics educational research. However feminist revisionist work deviates from traditional qualitative work: the method of resistance derives from an argument that research should be guided by the experiences of others beyond the interests and concerns of a patriarchal society. They question those interests and concerns by endeavouring to give voice and situatedness priority to learners who are disempowered by their gender. They do this by working within established frames to reinscribe that which they are resisting.

Commonly held views on qualitative research tend to polarize qualitative approaches from quantitative methods into the dualist worlds of hard/soft, and of objective/subjective. However, there are more similarities than differences between the conceptual categories of both approaches and the kinds of researched/researcher identifications these categories make possible, and it is not entirely useful to make binary distinctions here. Polarizing overlooks a fundamental problem in both approaches: the problem of the humanistic subject, always already rational, coherent and unitary and hence, analytically generalizable.

The revisionist's principal concern is with human experiences and understanding. Like other researchers, both qualitative and quantitative, they seek out an interpretation of amassed data which will enable truth in human terms to be discovered. Characterised by a belief in an essential human nature and in the power of reason to bring about human progress, their research derives its understandings and values from what we know as Enlightenment thought, and which encapsulates much of what we understand as modernity. It is this particularly powerful discourse which determines what counts as valuable knowledge and who has access to the production, the distribution and the legitimation of knowledge.

But what are these modern understandings? In terms of the 'research participant', revisionist inquiry presupposes an essence at the heart of the autonomous individual which is unique, coherent, and fixed and which determines what she is like. For these researchers, that essence is girl/womanhood. The reality for *the girl* in the classroom, it is claimed, is essentially different from those of boys. It arises from her *essential femaleness*, and does not stem from her constitution in the social realm as different from boys, nor from the way she is subjected to cultural and classroom relations and processes in different ways from boys. Moreover, whereas the existence of two different realities for girls and for boys are taken to be equally valid, it is the experience of girls which is deemed to be the source of true knowledge and the basis for interventionist work. Granted that the revisionist discourse reorders the humanist discourse for girls' advantage, nevertheless there are important convergences between the two approaches:

both rest on the view that subjectivity is the coherent, authentic source of the interpretation of the meaning of 'reality'. And if reality as authentic real knowledge and experience is sourced and located by the subject, the subject is the source rather than the effect of language.

To understand this, it is helpful to consider that for the revisionist, the girl's experience in the classroom is what she thinks and feels in any particular situation. She expresses this in language. Her experience is prior to language but requires language in order to be communicated to other people. Since her experience is rational and coherent, any contradictory knowing is considered flawed knowing, irrational and lacking in direction. The methodological procedures used to access this experience are multiple in design, and usually utilize a process of triangulation to secure an in-depth understanding. In turn, this experience is authenticated and validated through careful cross-checking of the researcher's and the researched's accounts and evaluated against an epistemological standard of whether the work communicates or provides us with some new knowledge.

The revisionist text promises much. Wrapped up in the language and rhetoric of postpositivist discourse it promises a more descriptive story - one in which greater rigour, more breadth, deeper complexity, and more richness is brought to the inquiry. What is important here is that the realization of the promise is dependent upon an unarticulated agreement between the various parties in the research - the participants, the researcher and the reader of the report. The effectivity of that exercise revolves around certain shared understandings, namely, that the girls' experiences are true, that the researcher's observations are to be trusted, and that the research report is transparent. Yet this is an agreement that can never be realized. In saying this I am not arguing that recent analyses of the schoolgirl in mathematics are in some way flawed, have not met the expected standards of objective scholarship, and are consequently in need of transcendence. My point instead is to argue that meanings about the girl which are made to signify in research practice are but one way of telling educational stories. They are premised on certain understandings which, closeted under a veneer of more sophisticated theory, are bound to a form of positivism which stacks the standards. It is those very standards and the assumptions upon which they are founded, which are problematic. In the next section I want to investigate those very standards and examine how they might be challenged.

## THE PRODUCTION OF STANDARDS AND MEANINGS

Revisionist work in gender research offers certainty and apparent access to truth. This access, however, glosses a double issue: the issue that arises from the categories we construct and their derivative conceptual order necessary to access this truth. The question at stake is not the existence of such categorical impulses, but whether our conceptual categories can have any legitimacy when representational certainty is in crisis. In the first place there is the problem of how we as researchers have been traditionally constructed. What modes of thinking are made possible by this structuring and what kinds of identities are summoned and what kinds are dismissed? What strategy of image and narrative representation is called upon and what are the

political effects of this strategic enactment? The second concern deals with issues of interpretation in the reading of the research text. How can we guarantee insight for others from our own studies? Is it possible to stabilize the meanings of the text, without mediation, to ensure knowledge, understanding and truth?

In gender inquiry the researcher is the sole arbiter of knowledge - a disembodied researcher who can bestow authority and credibility onto the experiences of girls in the classroom. The starting point is a unitary, noncontradictory researcher, a subject split from what it is he or she knows. In an attempt to isolate their science from non-science, those who carry out investigations of the 'reality' of the girl in mathematics are drawn to the notion of 'objectivity', believing that it is both *possible and desirable* to maximize observational efficacy, to minimize researcher bias, and to permit replication and/or verification, precisely because the researcher is always already rational and stable, bound to self-presence, saying what he/she means and meaning what he/she says.

Lessons learned from Foucault suggest that there are, however, more valid subject positions than the objective and disinterested observer and narrator, an observer and a narrator fashioned from noncontradictory experiences, from the innocence of observable data, and from the transparency of language. To question the status of the objective and disinterested observer/narrator is to elevate traditional concerns over researcher bias and the objectivity at an entirely new level. Over and above this elevation stands a proposition which takes issue with the modernist separation between the *knowing subject* and an *objective world*. Donna Haraway (1988) captures this point when she says there is no 'view from nowhere' Objective reality can never be captured; it can only ever be approximated. There is no stable unchanging world, no realm of objective truths, to which anyone has access. There is no conceptual space not already implicated in that which it seeks to interpret. To understand what this might mean for the researcher we need to think of the researcher's knowledge of classroom life as always preinterpreted, clouding his/her perception of reality. It is not to be trusted. It is not to be trusted precisely because when the researcher fixes meaning, he/she does so with regard to the discipline, and with regard to his or her own history and social markers. In negotiating the contingencies of language, rhetoric, power and history, the researcher is always privileging particular social interests since it is simply not possible to 'see' without a commitment to examine one's own position.

If there is no naked and manifest real, we can know a thing, or an action, or an event, only through its representation. Lather (2000) takes up the point to suggest that truth cannot be established and validated and claim exclusive privilege in its representation. This idea unsettles the very foundations of what we know as conventional research practice, undermining orthodox notions of observation and its representation. Reality, it seems, is in a constant process of construction and that which is warranted at one time, may be unwarranted at another time. What this means for the researcher is that his or her authority comes under assault. When the relationship between the real and its representation is in doubt, theorizing becomes more tentative, and the best we can do is gesture toward truth by looking through the "detour of

performance” (Lather, 2000, p 155), and give up the impossible struggle of establishing mastery.

The research text spawned by observation is always only a limited writing strategy, written to, for and from others. Who those others are is already predetermined to some extent by the academy. This is the Nietzschean realization that reading and writing are both inadequate yet necessary, caught up in the contingencies of representation and its interpretation. It follows that if the transparency of language is a myth then writing has no essential meaning. The words that the reader sees cannot serve as markers that convey notions of a world; they cannot be read as isomorphic to their referents. The words in the text must be seen as an endless permutation through which a multiplicity of meanings or discursive events interweave in power-laden contexts, clamoring for expression. As Berman (1988) argues: “Language wherever used is composed of structured signifiers, systematized among themselves by differences or oppositions and linked to signifieds in a way more tenuous than even Saussure realized” (p136).

There is much in the research text that eludes the logic of ‘absolute and true’ interpretation. Although the researcher writes as an apparent self-present subject, of something unified and whole, something in the writing will always have been suppressed in order to sustain the appearance of unity. When distinctions are made among events and when networks and levels to which these events belong are differentiated between and connected in some way, some sort of ordering and unifying has already taken place.

The problem for the writer is that words are constrained by the instrumentalising parameters of representation. Meaning will always be political, contextualized within systems and relations of domination and subordination which give society its current form. These forces work through the text in ways that neither the writer nor the reader can fully anticipate or control, so that the text becomes inherently unstable, in flux, constituted by traces of other signs and symbolic statements. Britzman (1997) calls this “the existential limit of representation: both presentation and absence” (p35). There are many slippages between language and the knowing subject, both the researcher and the audience: every act of writing and reading becomes a new production of meaning. Since there can never be a clear unambiguous statement of anything, including an intention or a meaning, the writer can never be sure how, at any given moment, the text will be interpreted. This suggests that both the researcher/writer and the reader re-inscribe the inclusion and exclusion of both the knower and the known from the production of knowledge. It is in this way that knowledge is politically and historically constituted, ‘made’ by human communicative action.

When we approach the issue of research in this way it is possible to claim that, in the act of writing, the writer is intimately tied to an institutionalized academic endeavour. The writer of the research text, cannot claim to be the source of authority and guarantor of meaning since he/she is, with regard to the question of my research proposition, persistently responsible, in the Derridean sense to the trace of the ‘other’ the academic reader. Hence we have to shift from an

understanding of a seamless report free of the contamination of language to a concept that one is always writing and reading oneself into a report.

My discursive strategy cannot be dissociated from the place of enunciation and the enunciative, textual game in which I am involved. The thinking/speaking "I" which signs this paper is neither the owner nor the king of the complex network of meanings that constitute the text. (Braidotti, 1989, p93)

## CONCLUSION

A critique of the assumptions of objectivity, authorial voice, and universal meaning unpacks a different question from those routinely investigated in discussions of mathematics educational research. But unlike routine questions what it does do is confront the challenges presented in a world of rapid social change and its diversification of lifeworlds. In this world of shifting and uncertain meanings, science, as Hutcheon (1988) notes, becomes a much contested cultural space, and traditional methodologies are increasingly seen as inadequate and inappropriate. Since Hutcheon's point is not firmly-held in our discipline, the intent in this paper was to contribute to the debates about research by alerting those of us doing research in mathematics education to this new contested cultural space.

In this new round of the research debate the crossover between mathematics educational theory and postmodern understandings has few common denominators. To understand this we need to appreciate that this new philosophical critique unsettles the very foundations of what we know as conventional research practice which tend to valorize distance, detachment and objectivity, and in which methods are used in order to mirror reality. The terms of the debate attack our most firmly-held research assumptions, undermining orthodox notions of observation, its representation, and the transparency of language. In this new theorising, important questions about the authorial voice are asked, raising further questions concerning the fundamental relationship between the knower and the known. These have profound implications for the organisation, the conduct, and the evaluation of much intellectual inquiry in the field.

Theorising the politics of observing and recounting is one thing, but it is a more difficult matter to explore how we might, in carrying out research, attend to those issues surrounding the production of reality, when the truth which we want to grasp escapes knowledge. The hope is that that issue will be addressed in the near future.

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