

The awareness of the importance of the social, cultural and political context of thinking, teaching and learning: Some elements of my own journey¹

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1. My cultural background

I am glad to have the chance to talk to you about how I became aware of the importance of the social, cultural and political contexts in teaching and learning and how these contexts appeared progressively in my work. I am grateful for this opportunity because in talking to you I am also talking to me about those things for the first time, at least in an explicit way. Talking makes us aware of things that so far may have remained just sensed, or semi-sensed, or in a region of consciousness that is half way between the conscious and the unconscious. It was Vygotsky who, many years ago, in his book *Thought and Language*, quoted the early 19th century poet Osip Emelievich Mandelshtam saying:

I forgot the word that I wanted to say,
And thought, unembodied, returns to the hall of shadows.²

It was during the reflections I made to answer the topic of this meeting that I became aware of many things, some that I already suspected, and others that were new to me.

Let me start by mentioning something about my original background. I was born in Guatemala—a small country of 110,000 km² (that is, 2.5 times the size of Denmark) with an estimated population of 14,000,000. Guatemala is a county of marked contrasts. Culturally speaking it is both very rich and extremely controversial. Its cultural richness is reflected in the amount of languages spoken in the country. In addition to Spanish, which is the official language, there are 22 Mayan-derived languages. The country is

¹ This paper was prepared in the context of a Ph.D. course organized by P. Valero, T. Holmgaard Børsen and X. Du (Aalborg University, Denmark, Nov. 2-5, 2009) in which I had the pleasure to participate as one of the guest lectures. In the first intervention in the course the lectures (W.-M. Roth and I) were asked to present our reflections about how we began incorporating socio-cultural and political perspectives in our academic work and thinking.

² O. E. Mandelshtam, *The Swallow*, quoted in Vygotsky, L.-S. (1987), *Collected Works*, v.1, p. 243.

culturally controversial in that this richness is not necessarily recognized as such by those who speak Spanish only, an attitude that leads to a kind of ethnic discrimination.

The marked contrasts appear also at the socioeconomic level. While a few people have a lot of money and live a life of full luxury, 29% of the population lives below the poverty line. So, growing up in Guatemala means being confronted every day with the evidence of social injustice and all the consequences that it entails, such as insecurity and the contradictions of the unjust distribution of wealth.

I grew up in Guatemala City, close to downtown, in a neighborhood of beautiful churches that have conserved some of the characteristics of the 17th century colonial period. Every day I was woken up by the churches' bells and walked to my school, which was situated just in front of the main square—a place surrounded by the Government building and the Cathedral, a reminder of the division and alliance of spiritual and political powers so typical of the former colonies of Spain. I went to the national University (Universidad de San Carlos de Guatemala) and completed a degree in engineering. During my years as student at the engineering school, I had the opportunity to meet many students and professors who were active against the oppressive regimes of political right and their allied military and paramilitary forces. Some of them left, others remained and, among them, many were killed. I keep with me the memories of their bravery, for opposing the regime was a courageous act—one that could cost your life. I always keep with me, in particular, the memories of my Calculus professor, Carlos Cabrera, who was murdered one evening when he was leaving the University Campus. In the middle of a trying turmoil, I left in 1980 to study my Ph.D. in France.

2. The experience of a foreign culture

Of course, my stay in Europe marked me in different ways. The structure of sociocultural classes and French political thought were very different from what I knew. Something that struck me was the fact that France is a country whose citizens are very proud of their past. I grew up in a country where, by contrast, the relationship to the past was far from easy—indeed, problematic in an important sense. Let me explain.

The arrival of the Spaniards in Guatemala in the 16th century destroyed everything. Upon their arrival, the Spaniards dismantled the social and political structures of the Mayan and other cultures that they found on their way, and imposed theirs. The natives were subjugated and assimilated into a form of life that was completely different from their own.

As a result, when we turn to our past it is not clear if we should refer to the pre-Columbian cultures and civilizations or to the mixed and non-coherent civilization that emerged out of the displacement and suppression of the pre-Columbian cultures

accomplished by the Spaniards. This non-coherent culture that despised the natives and their world and that, at the same time, was no longer European, sought to find a proper identity in the 19th century by cutting its political ties with Spain. But such a move was too late or simply impossible. The culture that emerged from the 17th century on, based on an impressive massacre of natives and the imposed submission of the survivors, was constituted also by a big population of blended people, the “mestizos,” that resulted from intercourse of the colonizing white men with aboriginal women. Neither aboriginal, nor European, the new population of mestizos and descendants of Spaniards had difficulties finding an identity for itself.

So when turning to our past, it is not clear if we should turn to the pre-Columbian civilizations or to the non-coherent one of alienated colonizers and colonized people. To understand the scope of the tension that impedes us from finding our past, I want to refer to the social theorist Cornelius Castoriadis and his idea of imaginary collectives.³ Imaginary collectives belong to the *symbolic order* of a society. They belong to ideal structures that societies construct on the basis of what is already there in their past. Imaginary collectives subsume individuals and offer them social forms of signification. They are not well defined, for one of the characteristics of collective imaginaries is that there is always a gap between signs and their objects. They are difficult to pinpoint, yet they are there. Each one of us participates in the symbolic order of our society; this is what distinguishes us from other individuals of other cultures. There is a kind of implicit recognizance of what makes us similar as a collective and what makes us different from members of other cultural collective formations. Using Castoriadis’s terminology, I would say that what the Spanish conquerors did was much more than take the gold of the pre-Columbian cultures. They simple mutilated their collective imaginary. If we cannot find our past, if we cannot see it, it is because our collective imaginary was decapitated.

When I arrived in France I was hence very impressed to see how easy it was for the French to recognize their past. I was very impressed to see their historical continuity, even in the events of the political rupture of the French Revolution in the 18th century, and the resultant emergence of new identities. There was a rupture, true. However, there was also a historical continuity, a perspective to distinguish between the before and the after. The French governmental structure was previously an absolute monarchy with feudal privileges for the aristocracy and Catholic clergy. With the Revolution this structure underwent radical changes based on Enlightenment principles of citizenship and inalienable rights.

³ Castoriadis, C. (1987). *The imaginary institution of society*. Massachusetts: M.I.T. Press.

The French Revolution is indeed not something that appeared suddenly, and out of the blue. It was the political, economical, and concrete expression of the ideas of the philosophy of the Enlightenment and the expansion of the new forms of liberal production. In fact, the French Revolution and Kant's First critique, the *Critique of Pure Reason*—one of the most enlightened of all works—are contemporaries of one another, only 8 years apart. The occurrence of the French Revolution was hence not something completely unexpected, which appeared suddenly. The arrival of the Spanish conquerors in what we now call the American continent was, in contrast, everything but expected. Literally, the Spanish conquerors appeared out of the blue.⁴

The French reverence towards its past, was hence for me something amazing, unbelievable. However, the veneration of the French for their past was not the only thing that amazed me. Culturally speaking, I was also impressed to find myself in front of significantly different forms of alterity, that is to say, forms of attitudes and relationships to the other. Indeed, they were very different from those I was familiar with.

3. The intellectual dimension

Let me say something now about the intellectual aspect of my European experience. I spent the first year studying mathematics. To be a mathematics educator in France (at least in the 1980s) you had to be a mathematician first. So, they recognized some of the mathematics that I studied before in Guatemala in the Engineering School, and asked me to start by taking some graduate courses in mathematics. I studied mathematics and that was an extremely rich experience. I enjoyed studying mathematics as I had never enjoyed anything else. I discover something that I would think impossible before: mathematics as an aesthetic experience. There was something extremely new—something that may find a certain resemblance in the poetic, musical, and visual artistic experience only: The experience of mathematics, that is, the beauty of proving, exploring, recognizing, generalizing, in short the experience of being amazed. That year devoted to mathematics was perhaps the best or one of the best of my life. I remember how I wished that days would be longer...

As in my new cultural life, differences were present in my intellectual life too. The French approach to mathematics was different from the one with which I was accustomed. The textbooks in which I learned mathematics were translations of USA university textbooks. They were very different from the Bourbaki style of the French. So it was not easy to adjust, but I did it. I entered a new form of mathematics practice that

⁴ To my knowledge, one of the best cultural accounts of the Spanish invasion is Tzvetan Todorov's book *La conquête de l'Amérique* [The conquest of America], that I discovered in 2001.

had its own ways of posing and solving problems, its own way of theorizing. Very French. Very Cartesian.

Indeed, Bourbaki's philosophy of mathematics is Cartesian through and through. You can almost recognize Descartes' famous *Rules to Conduct the Mind* in Bourbaki's obsession with starting from clear-cut and well distinguished principles, which is the idea of analyticity sponsored by the great Descartes.

I learned to appreciate the beauty of rigor, succinctness, mathematical elegance and many other French aesthetic mathematical values. I learned to appreciate French wine as well.

These things seem to be of little interest for our discussion here, but they are actually of some importance. As I will argue in one of our next meetings, cultures equip us with the raw material to form aesthetic, scientific, mathematical, political and other ideas. Without being straight-jackets, cultures subsume us in symbolic webs of signification and offer us a symbolic space of possibilities to think, feel, love, and act in certain ways.

The university in which I was studying had a program where psychology and epistemology were two main components. We studied Piaget in detail. The question of mathematical thinking started to appeal to me. I followed a course of logics and was very impressed by the debate between classical, intuitionist and constructivist currents and their differences. Something that struck me in a significant way was the fact that mathematicians were not really in agreement concerning questions about the foundations of mathematics! Mathematics was not as solid as I thought! Some were accepting certain proofs and other were not; for some mathematicians some proofs prove but for others the same proofs did not really prove. So, truth and the ways to assert it, I discovered, were relative!

The topic of my PhD was in logical thinking. My advisors were Georges Glaeser, François Pluvinage and Raymond Duval. I was in particular interested in questions about deductive reasoning. How do students interpret and deal with implicative statements? Do they distinguish between necessary and sufficient conditions? The manner in which the questions were asked was very Piagetian. I wanted to see if some people in the world were using other logics than the Aristotelian classical one. I wanted to see if there was some research being conducted on that topic. I remember that I went to see my professor of formal logic, who was a great mathematician. After thinking for a while, he referred me to the only book that crossed his mind—the Bible!

I discovered many years later that, when I asked that question, cross-cultural psychology, as a scientific discipline, was just emerging. It took me years, in fact ten years to be exact, to discover that my answer was not to be found in classical

psychological research (let alone in mathematics education) but in an emerging research field, the way of which was paved by some sociologists like Émile Durkheim, Lucien Lévy-Bruhl, Claude Lévi-Strauss. It took me many years to realize that my question was at the heart of the research conducted by Vygotsky and his historico-cultural school of thought. It was in the mid 1990s that I became acquainted with Luria's famous psychological expeditions to Central Asia. These years were very important to me. I asked my question in 1985, one year after Vygotsky's opera magna *Thought and Language* was finally translated into French. Indeed Vygotsky became known very late in France. And as mathematics education is concerned, he has not been very popular there, not even now. As I discover later, during a visit in 2009 to the Université de Genève, at the occasion of Premier colloque international de l'Association pour des Recherches Comparatistes en Didactique, Vygotsky has been much more popular in Piaget's land than in France!

4. The return to my origins and the Canadian experience

After finishing my PhD in France, I came back to my country of origin. The return and reintegration into my culture was supposed to go smoothly. Well, to my horror, it did not. I felt alien in my own country. It took me about three years to adapt. And things were never the same. Cultures and their individuals are always in flux. We change and everything around us changes. Cultures are not static, nor are their individuals. Connections can be lost and never repaired.

In the end, after six years in Guatemala, I was invited to go to Montreal and work with a research team on algebra directed by Nadine Bednarz. The research team was very good. It included some fine math educators. We did a lot of experimental research. But the team included two historians of mathematics too—Louis Charbonneau and Jacques Lefebvre. And I became engaged in a careful study of Vieta's and Diophantus' work. In 1992 I wrote my first "epistemological" paper, which was to be followed by a series of papers on the evolution of algebraic ideas. As I retrospectively view this epoch in my life, I recognize in it two aspects of my stay in France. As I mentioned previously, epistemology was an important part of my PhD program. But more importantly, I recognize something that I learned to appreciate in France —the historical dimension of ideas and social actions.

As you can see—and I think this is not something particular to my personal journey—our interests in life, scientific and others, are shaped by our cultural experiences. The fact that this experience remains unarticulated, the fact that it remains implicit, does not mean that it is not there. In my case, the discovery of the French

fascination with their past led me to appreciate history as a general category of sense-making.

The historical investigations that I conducted during the first half of the 1990s were important in making me aware of the fact that, in different historical periods, mathematicians were not asking the same questions. On the contrary, questions and the methods used to tackle them were very different—sometimes incommensurately different. Contrary to what standard accounts of the history of mathematics were saying mathematical thinking was not something universal but rather in constant evolution. It was not like a tadpole becoming necessarily a frog. Bit by bit emerged the idea that it was culture which was causing these various forms of mathematical thinking to be different .

Of course, scientific ideas were easily associated with their cultural origin. Mathematical ideas were not. And, at that time, just a very small number of historians of mathematics had ventured to relate mathematical thinking to culture. How to make, in theoretical terms, the link between mathematical historical ideas and their culture? It was clear for me that a causal account was doomed to failure.

Engels wrote in *Anti-Duhring*:

Each historically defined form of material production has its corresponding form of spiritual production. So for example, a different form of spiritual production than the type which was prevalent during the Middle Ages fits in with capitalism. (Quoted in Vygotsky, *The socialist transformation of man*)

Even so, things, I suspected, were more complicated than merely associating the spiritual or ideological realm with the material. There cannot be a causal or other form of direct link.

I was extremely happy when I found several years later this startling statement that Vygotsky made in one of his most important papers, from the point of view of the development of his own ideas: In Chapter 5 of *The Crisis of Psychology* he says: “Reality exists even in the imaginary abstractions of mathematics.”

This question occupied a lot my time in the mid 1990. In 1996 I read an extremely interesting book that helped me a lot. It was written by a Spanish sociologist, Emmanuel Lizcano.⁵ I was so impressed by the book that I even wrote an article-review about it. It appeared in Spanish in a journal published in Mexico and with a wide distribution in the Spanish-speaking countries in the world.⁶ In this book Lizcano was asking the questions of mathematical thought and culture in a Foucauldian way. He said: “In all

⁵ Lizcano, E. (1993). *Imaginario colectivo y creación matemática [Collective imaginary and mathematical creation]*. Barcelona: Editorial Gedisa. The second edition appeared in 2009.

⁶ Radford, L. (1996). Lizcano y el problema de la creación matemática. *Mathesis*, 12, 399-413.

cultural formation, the corresponding social imaginaries orient the manners in which mathematics is conceptualized. These manners determine in a radical way the mathematical contents . . . There are as many mathematics as forms of thinking and talking, forms that are but expressions of their collective imaginaries.” (2009, p. 265).

Drawing on Lizcano’s book, In 1997 I published a paper in *For the Learning of Mathematics* that dealt with the question of mathematical thinking and culture and tried to make a point about the relevance of those things for the teaching and learning of mathematics.⁷ I tried to convince my colleagues that Brousseau's idea of the epistemological obstacle, which had become very popular at the time, was based on a universalist view of development that is not compatible with a sociocultural view, and that there were good reasons to consider that such an idea might not be as useful as it was thought before.

From Québec to Ontario: Otherness as an explicit category of Being

Let me now come back to the following steps in the cultural dimension of my journey and say something of what happened when I moved to Montreal. To my surprise, the insertion into my new Canadian culture was smooth. Perhaps I had so many scars already that it did not matter. Or perhaps it was the sensitivity and openness of the Canadians to the other and the foreigner that made me feel at home from the start. But things did not stop there for me. One year later I moved to Ontario. To become immersed into an English speaking environment was something new. I had to learn a new language and immerse myself into a new way of thinking and living. I came to realize that while French is similar to Spanish, English is something else.

As time went by, I learned to appreciate new things. One major "discovery" for me was the fact that cultures should remain open in order to ensure varied participation and fair development for all. If I use quotation marks to talk about this, is because it was not a theoretical or personal discovery, but a social discovery, something that I discovered in my interacting with others. I also discover something that had remained as a kind of intuition and that reached in Canadian soil a new layer of explicitness, namely a new form of alterity and one that has become a central theme in my recent work on ethics.⁸ By this I mean that I learned that our relationship to the other is the central fact of human life. Attention to alterity in the aforementioned sense is the centre of purposive and

⁷ Radford, L. (1997). On psychology, historical epistemology and the teaching of mathematics: Towards a socio-cultural history of mathematics. *For the Learning of Mathematics*, 17(1), 26-33.

⁸ Radford, L. (2008). The ethics of being and knowing: Towards a cultural theory of learning. In L. Radford, G. Schubring & F. Seeger (Eds.), *Semiotics in mathematics education: epistemology, history, classroom, and culture* (pp. 215-234). Rotterdam: Sense Publishers.

socially fulfilling ways of living, the only way in which to avoid, I want to argue, the alienating dimension of modern and post-modern worlds. It might not be inaccurate to say that my current interest in ethics and the awareness that consciousness is not merely knowing but that knowing and being are deeply interrelated, is the articulation of an extremely important feature of the Canadian way of life. I might merely be articulating something that is already there, in the Canadian collective imaginary, to borrow Castoriadis' term.

In my research and my teaching, I try to convey these discoveries that I made as I moved from one culture to another. I try to move away from rationalistic and instrumental conceptions of teaching and learning and to convey rather one in which communication, responsibility, and communitarian engagement become prominent aspects of life⁹.

I hope that this personal journey answers the questions of this first meeting. It shows, I think, how I became aware of the importance of the social, cultural and political context of thinking, teaching and learning. It also shows how from there emerged a progressive awareness of the profound relations between learning and its social, cultural and political contexts—an awareness that led to a shift in my previous thinking.

⁹ Radford, L. (2009). L'altérité comme problème éducatif. In J. Boissonneault, R. Corbeil & A. Hien (Eds.), *Actes de la 15e journée Sciences et Savoirs* (pp. 11-27). Sudbury: Université Laurentienne.