SHIFTING PSYCHOLOGICAL PERSPECTIVES ON THE LEARNING AND TEACHING OF MATHEMATICS

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My starting point for attempting to shift my psychological perspective arose, like many motivations, with an inner disturbance. This disturbance prompted self-reflection on my work as a teacher educator and emanated from a growing awareness of a disconnection between my personal theorising and my practice. I was a teacher educator and director of undergraduate programmes in a higher education college. My pedagogical focus was in mathematics education working with student teachers on early years programmes.

I felt my practice to be limited by a theory of learning that drew mainly on a cognitive psychology of the individual. This perspective allowed little opportunity for me to engage with the insights that some student teachers brought to their work of becoming a teacher, including those relating to group learning both in university with their peers and in school with children.

Is it possible for me to work more effectively with student teachers in ways that acknowledge and creatively use the excitement, struggle and fear of becoming different – *other* – a struggle partly borne out of social and cultural expectations that students should leave behind aspects of the uninitiated self and make psychological space for the emergence of a very particular professional teacher-self? Of course, what I am speaking to here are my own anxieties of becoming.

Why do I have concerns about what constitutes a professional teacher-self in the current climate? How might I mediate these concerns in an ethical way when working with students? When I began to attend in this way to my own experience as a teacher educator, what I noticed was that some students – very effective in many ways when working in classrooms – nevertheless resisted integration of aspects of their emerging teacher-self. Where I anticipated growth, development, adaptation, a necessary compliance, there I found resistance. Where, on entry to the course, there had been pride and excitement at becoming a teacher, I found cynicism, disappointment and a lack of intra-psychic harmony. A constructivist psychology was inadequate for the task of addressing these issues.

Psychic disharmony can coincide with the emergence of two competing selves. Students saw some of their core identifications with aspects of their current self as revealing inappropriate professional qualities. Since my work was with student teachers who intended teaching children in the three to seven age range, I was reminded more than once that physical contact with children – holding, containing, cherishing and caring for them – had become contentious issues and could generate great anxiety in those training to teach. Many student teachers expressed a desire to respond physically and emotionally to the young children with whom they worked, but they had learned (and were explicitly taught by some staff) to identify such desires as unprofessional. Perhaps, in this way, the students were being trained to submit to a process whereby they introjected the anxiety of a culture suffering a crisis of trust?

Teaching mathematics provided an unanticipated space for exploration of the challenges of becoming a teacher. Several student teachers reported being surprised by the strength of the associations between unexpected recollection of memories of learning mathematics and the demands being placed on them as student teachers. My research became an exploration of working on professional change through the teaching of mathematics. How can the teacher educator and the student group negotiate the psychological impact on individuals of a new professionalism that redefines natural human activity as unprofessional and highly suspect, if not illegal? How do the student teacher and the teacher educator tolerate becoming the container for society's fear of the unknown other, the dangerous outsider? At an individual level, many students experienced a split between personal and professional selves that could not easily be healed.

And mathematics appears to be a more problematic subject than most – for children, students and teachers. Is it possible that its generalisability and symbolism invests mathematics, more than other subjects, with the power to form metonymic signifiers that permit unconscious psychological processes to be signified by and through the mathematics itself?

It was within the context of this personal reflection on my practice that I sought to revisit and re-view my work as a mathematics educator. What I present here are two attempts at exploration. The first involves some detailed discussion of the writing of Blanchard-Laville, who explores some intersections of mathematics and psychodynamic psychology. The second is a discussion of an episode of my teaching.

Discussing the writing of Blanchard-Laville

In her book, *Les enseignants entre plaisir et souffrance*, Blanchard-Laville (2002) gives three examples of the inseparability of mathematics and lived experience. She gives an autobiographical account of her early years in a tiny school where her mother was the class teacher and her father the head teacher. Elsewhere in the book, she reports on her research into the study of pedagogy through the application of a psychodynamic lens. She quotes from interviews with Hélène, a student at the Université de Nanterre and Jocelyn, a school student.

Blanchard-Laville, a professor of mathematics at the University of Paris, recounts her surprise on re-discovering what she had written in an exercise book that she had completed as a seven-year-old in the school where her mother taught "les petits" and her father "les grands".

One homework exercise contained the following question alongside which was her own written response: *Why are* *girls frightened of arithmetic? Girls are more frightened of arithmetic because she are* [*sic*] *less successful.* [1]

Her mother (also her class teacher) had added in red, *than boys* and had corrected her grammatical error, which Blanchard-Laville now suggests was a 'Freudian slip', denoting that the little girl knew very well that it was *she* who was the singular referent. Was she less successful at arithmetic [...] than boys? Or less successful than her mother desired her to be, for whatever reasons that mothers might wish such things of their daughters? Or teachers might wish such things of their female pupils? What opportunities are presented through reading this fragment – an extraordinarily condensed and powerful symbolic fragment – from 1949? What is the likely impact of such questions on a child? What provocation is invited? What prohibition implied?

Is it not likely that exposure to such statements, emanating from the doubly parental figure of teacher and mother, could continue to have an impact long after the actual event eludes conscious recall?

To take a theoretical psychoanalytic view requires us to locate how we learn mathematics and what we learn within the broader perspective of how we learn to function as relational individuals, and (as in Blanchard-Laville's own case) how and why we might learn to become (university) professors in mathematics.

Hélène

Hélène, one of Blanchard-Laville's interviewees, relates how learning mathematics has played an important part in her life since she was a primary school pupil. Ever since she can remember, Hélène has claimed that mathematics is incomprehensible. She recalls always having had problems with mathematics and is unsure whether her problems emanate from her teachers or her attitude to herself.

Her mother's attitude to her strikes Hélène as significant. She promises Hélène a successful career as a mathematician, with a promise sworn to the Virgin Mary.

She likens Hélène to her absent (divorced) father – informing her that Hélène resembles the husband/father and that he is a successful mathematician. Hélène is the ever-present reminder of the absent father's (lost) love. Also, perhaps inevitably, a reminder of love's transience – with loss and abandonment contained within the very first moment of meeting.

For Blanchard-Laville, Hélène is a representation of the absent father and this absence is enmeshed with her learning of mathematics. Hélène's learning of mathematics is inseparable from the construction of her self. She becomes the symbol of love-hate – a conflict without end. The love-hate of personal existence then becomes symbolised by and within the learning of mathematics, which Hélène herself said she 'chose' to manage through a process of public blocking and paralysis, and private enjoyment.

Hélène's resistance to being positioned as the absent other, is manifested through her public inability to do mathematics. Her resistance invites conflict with the mother, but does lead to a lessening of her mother's persecuting control over her and a greater opportunity for Hélène, through her mental block of mathematics, to be acknowledged as an individual, albeit an individual who cannot 'do mathematics'. What Blanchard-Laville reads into Hélène's account is a secret love of mathematics, which materialises only when she is alone, absorbed in a mathematical problem. In secret, mathematics does make sense! In front of her mother, mathematics continues as a perpetual series of crises.

Jocelyn

Jocelyn, a thirteen-year-old, was receiving help from the local education support services. She was born of Indian parents in Madras, abandoned and raised in a mission until adopted into a French family at the age of four-and-a-half "as a sister" for their ten-year-old daughter. When adopted she spoke Tamil, Hindi and, apparently, some English. The adoptive parents dropped her Indian name in favour of a little-used French name, reflected in Blanchard-Laville's choice of pseudonym.

Jocelyn had been receiving psychological and counselling support for a year when her mother made a specific request that help with mathematics be provided, since this was the only area in school where she had difficulties. In her discussion with the psychologist, Jocelyn reported,

> It's usually my sister (aged 17) who corrects my algebra. If I make a careless mistake, a little mistake with the algebra, she gives me two more exercises. [...] If she's very busy I ask my mother. If I'm doing geometry, I tend to ask my mother or my father. [2]

Her family exerted strong control over her schoolwork and her homework exercises. Mathematics exercises had to be completed without error. A mark for homework of 16 or less (out of 20) was regarded as useless. Only 17 or above is good enough to satisfy family expectations.

Jocelyn's presenting difficulty was that she either resisted or was unable to make connections between the different mathematical ideas she was taught. She appeared to have a facility for memorising what she was taught and she could make use of new ideas during a session.

Her discussions with the psychologist revealed that she often failed to internalise mathematical ideas. She appeared unable to make connections between ideas presented in successive mathematics sessions. She could draw on earlier ideas but failed to adapt them to suit new situations. Where the wording of a problem did not correspond to her preconceived ideas, she became completely blocked, with no capacity to think or reason. (J is Jocelyn and I, Interviewer.)

> J: I want to talk today about, [...] a little bit of revision, because tomorrow there's a test on everything we've done since [...] since the beginning of the year. In algebra, which I understand very well, it's fine. I mix things up a bit, sometimes but I'm starting to get used to, between addition and multiplication sometimes, a little, a little [...]
>
> I: When you say that in algebra you confuse multiplication and addition, can you be more precise?
>
> J: I want to say that, well, I know that if you have a plus (+), if you have a minus (–) I know that it is the minus that always wins.
>
> I: For addition or for multiplication?
>
> J: For addition. And sometimes in multiplication,

there are the signs, –, +, – and after, between, there are, there is the × sign, sometimes, but not often, and sometimes I mix them up a little. Apart from that everything's fine, really, really good.

I: But when you say that in addition, it's always the minus that wins […]

J: Well, I wish, that depends, if there's two well […]

I: If there is one minus and one plus, for example?

J: It's the one that will have the, the biggest result in – that wins, but my parents taught me a rule and, well, when I find a – and a +, OK, I know that it's the – that will be in front, but it depends sometimes […] [3]

When and how does one become a minus: when one is born in India and taken away to France? How could that be turned into a winning plus? Was there a plus sign hanging above the mission door? And if so, what was the minus that won? Is it a plus or a minus to have your Indian name 'taken away' and a French name 'added'?

Jocelyn's discussions have a consistent theme. She starts by saying that she understands everything very, very well, (perhaps a defensive reflex to protect from family pressure) followed by a phrase like, "I occasionally muddle things up." When a mathematics activity follows, she often demonstrates total confusion and focuses on trying to provide what she judges is being sought in the social context by significant others, such as her parents, teachers or the psychologist in her counselling sessions. To Blanchard-Laville, Jocelyn often acts as a reflecting surface, trying to create images that conform to what she believes the other person wishes to see.

Jocelyn tends not to start discussions, even when she introduces the choice of exercise for discussion. She remains quiet most of the time. "It's always the adult who decides." Her tendency to remain silent or to follow the adult's lead, contrasts with her own relatively elaborate language structure, which suggests a good grasp of conversational style. Jocelyn tends to position herself as an object under the influence of a variety of subjects.

- What do *you* want me to say […]
- *We are given* 2*x* […]
- I didn't really understand what *they* wanted […]
- *Mum* didn't agree with me […]

And when she does use the pronoun I, it is often used to introduce an action or thought associated with doubt, confusion and lack of ability.

Blanchard-Laville draws on Winnicott's theoretical conception of true and false selves to theorise Jocelyn's behaviour. Jocelyn's pupil-self is organised around a dissociated mode of functioning. In relation to her mathematical studies, Jocelyn is "fundamentally absent" in the Winnicottian sense. She does the mathematics without really being alive to herself whilst she is engaged with it, whilst the symbolism of the mathematics can be seen as representing her inner symbolic conflicts more effectively than could other school subjects.

She gets embroiled in mathematical ideas and processes but often only in ways that continue to construct her as object to various subjects, with the net effect of sustaining a sense of confusion and preventing her own thinking from becoming a coherent process. In the same way she engages the interviewer over and over in little phrases and incomplete sentences that prevent the interviewer, and ourselves as readers, from *thinking in the moment*, "Where is Jocelyn in all this?" The sense that she is nowhere comes mainly from stepping outside our engagement with the dialogue and reflecting on her behaviour. The ability to step outside the interaction increases the opportunity to break free from the immediate influence of her dissociative presence.

Learning to tolerate the awkwardness of learning

I want to turn now to my own work with people preparing to become qualified teachers. Many of us working alongside student teachers have experienced, on occasions, their anxieties and confusion directly as if it were our own. Becoming consciously aware of this transference, however, is not always easy when tutor and student teachers are busy working together. Sometimes it is only possible to recognise the nature and source of the disturbance once we have stepped outside its immediate influence.

The introduction of psychoanalytic theory into the curriculum of student teachers provides another source of disturbance. Its use invites exploration, for example, of our desires for smooth untroubled learning and teaching. Britzman (2003) reports on the use of Anna Freud's writings with student teachers:

> At times, we do try to conduct our teaching as if learning will be no problem for the learner, and if problems do emerge, they are somehow viewed as obstacles to the wish for learning to be no problem. What is missed is an element of destruction and aggression that is also a necessary part of trying to learn. (p. 74)

I was made very much aware of the omnipotence of constructivist psychological models when exploring with students the processes of becoming a teacher, through the use of their own stories of learning mathematics and the classroom stories gathered from their classroom work. However, interpretations that lie outside the dominant paradigm can easily be disregarded in today's world with its emphasis on training and lists of specific behavioural competencies that students have to demonstrate. Avenues of thought can get closed off and alternative ways of thinking about *becoming* can easily be sidelined. Of course, a psychodynamic perspective is not surprised by its own demise and warns that there are unconscious forces of resistance to attend to.

I never felt that I had successfully resolved the problem of working with alternative interpretations. Whilst recourse to constructivist theoretical approaches often left me dissatisfied (the mischievous invocation of constructivist theories can make students believe that poor learning *always* correlates with poor teaching), nevertheless psychodynamic interpretations sometimes sat uneasily upon us in discussion, hence the claim that, for me, this is still work in progress.

In my teaching, I search for ways to disrupt the anticipated flow of teacher-student interactions in mathematics lessons, in an attempt to bring more sharply into focus assumptions about what constitutes teaching, learning, or 'proper lessons'.

At the end of one session, there was a strong disturbance emanating from tensions that arose between desires for closure and my attempts to forestall closure and keep the mathematical activity going. I suggest that many teachers and teacher educators have a strong tendency to go for closure during teaching, to foreclose on thinking time and to move swiftly on to the next bit of the lesson, with the result that mulling over and struggling with uncertainty is curtailed.

There appeared to be more to the disturbance in this session than a concern for ensuring that teaching is managed efficiently – with teachers delivering their lessons slickly in double-quick time in order to cover a crowded syllabus. My attempts to forestall closure became an issue for the group. I would tentatively suggest that it is by no means incidental that the disturbance involves a male tutor working with a predominantly female group of students.

During the session I ignored students' correct answers and resisted closure of the question and answer exchange that took place. I began by introducing the *Function game* to the group of about 20 students. I invited them to play the game and provided rules.

1. The game is played orally, but people are free to write notes if they want to (most did).
2. Only one calculator is available – used exclusively by me.
3. They are to offer me a number and I will enter it into a calculator.
4. I will perform the same operation on any number given to me. I will tell them the calculator output.
5. They must use trial and improvement in an attempt to give me an input number that will result in an output of 1.
6. The group is free to discuss what is going on. They should debate and then choose successive input numbers on the basis of their discussion.
7. I prefer numbers to be offered as a result of group discussion.

I requested a number, saying that I was going to begin with a very obvious calculation. This was to ensure that we were all clear about playing the game.

I was offered 6 and returned an output of 9; then 4 and returned a 7; then 12 and returned 15. There were several comments of:

- Three.
- Adding three.
- It's three more each time.

I called for a formal statement, which was volunteered by one person. I asked if we were all in agreement. No one volunteered anything more complex than, for example:

> Input our number, add something and then subtract that same number and then add three.

I began with a different function. I was offered 5 and returned 0.29411765. I was offered 13 and returned 0.76470588. It was at this point that Karen offered 17.

I was dividing by seventeen. I was surprised that it was offered so soon. I had no idea whether Karen had calculated, intuited or guessed 17. I could see that most people were still tuning-in to the activity and were beginning to get involved in one of several activities. I observed some people:

- checking they were interpreting the activity in the same way as their peers
- exploring the possible relationships between the pairs of numbers; 5 and 0.29411765; 13 and 0.76470588
- discussing how to record the information in a helpful way
- discussing how they could predict a 1 as an output number.

I felt that the acceptance of 17 as a correct answer would have:

1. Disrupted most peoples' thinking.
2. Emphasised the production of answers over the process of finding a suitable way of attacking the problem.
3. Rewarded speed rather than exploration and engagement.
4. Positioned me as the arbiter of correct answers rather than them through their collaborative deliberation.

I chose to look hard at the calculator and pretend to concentrate on pressing the right buttons so that I could keep eye contact with them to a minimum. This allowed conversation to continue. I realised I was in a position to ignore Karen's offering, by pretending that I had not heard it. This was possible because several people offered different numbers at the same time as Karen spoke.

One or two people were writing numbers in lists and organising the numbers in various ways, presumably trying to identify patterns. One person near me had written 17 in her list and had left a space beside it. All the other input numbers on her list had a corresponding output number in the form of a decimal. I can recall seeing the space beside 17 and thinking how empty and large it felt. There were now two people pursuing 17. Karen offered 17 again.

Karen: Seventeen. I gave you seventeen and you didn't answer me.

Me: Why did you say seventeen?

Karen: I think it's about three less each time.

Hearing this made me want to continue the activity. It wasn't clear to me whether she was thinking exclusively about an additive rather than a multiplicative process. I wanted different thinking processes exposed and examined for their appropriateness.

Me: What answer do you expect it will give?

Karen: Thirteen point something.

Me: That's not the answer I have here. [I paused but she seemed unready to pursue it any further for the time being]. Let's go on.

I heard fragments of Karen's continuing discussion with a partner that the answer might not be three less each time. I also saw the person who had written 17 and left a space, tapping the space and saying to a friend that I had not given them the answer to 17 so her list was incomplete. I ignored her comments.

Me: Right. Can anyone offer a comment about what might be happening?

We continued for several minutes, building patterns and predicting answers. Those who were not clear were offered ideas and suggestions by others. Then someone offered 10.

Me: What sort of answer would you expect?

Suzanne: Point five something.

I noticed several puzzled faces and looks of admiration. Suzanne is thought to be fairly smart at this kind of work. I asked her to explain her prediction. It involved looking back at the result for 5 and hypothesising that multiplying by 2 would give her 10. So, multiplying 0.29411765 by 2 would be appropriate, and this would give 0.58 something. I drew peoples' attention to Suzanne's use of ratio and multiplication and asked for some people who had been puzzled to test multiplication out on some other pairs of whole numbers in order to find out whether a multiplicative relationship might be possible. Out of the corner of my eye I saw the space beside 17 being tapped with a pencil.

You haven't given us the answer to this one.

No, I didn't.

Several comments came at once:

What are we supposed to be doing?

What is the activity?

Both of these comments were uttered with a tinge of frustration and annoyance – a powerful strategy for regaining control over the teacher's errant behaviour.

Trying to get 1 on the calculator?

Oh. It's got to be about sixteen because 8 gives 0.4705882.

It's going to be point 8 point 9 something.

It's seventeen.

Are you asking me to try seventeen?

Yes. Someone asked for seventeen before.

Karen: I did!

Yes I know. I tried very hard to avoid giving you an answer too!

I was struck by the quality of the disturbance and wanted to hold on to it. We finished the activity and began to discuss the pedagogical implications of what had just taken place. The discussion was animated and most people in the room spoke. I suggested to the group that *avoiding closure* is a pedagogical strategy that teachers need to have in their teaching repertoire but that its use is potentially disturbing for all involved.

Group anxiety is aroused when the teacher, as notional leader, changes the familiar leadership role, for example, by ceasing to contain the feelings of the group. The group can feel threatened when the leader hides or masks their motivations or intentions. Comfort can be restored when the leader returns to playing to the rules that are tacitly understood within the group. And comfort levels will increase even when the leader's role includes critical comment on individuals – as it inevitably does in teaching where the teacher is driven to convey explicitly to individual pupils whether, for example, their thinking is correct, their work neat, their answers elegant or their behaviour appropriate. As group members we are even ready to sacrifice individuals in the hope that we might continue to survive within the group.

Several people said that they did not receive the answers they wanted but did not feel sufficiently comfortable to challenge me by demanding that I respond to them and to Karen. Some reported being surprised at their level of reluctance to challenge me and ask directly for an answer when I was being evasive. They thought it would have been easy to intervene since they knew me quite well. On reflection, they realised it had been more difficult than they anticipated to close the activity, and to get me to change my behaviour.

I reminded them that I tried to avoid giving them any opportunity to engage with me. I avoided eye contact and busied myself with the calculator buttons, withdrawing from them. Some said they had not noticed any of this. Others reported that they had noticed the change in the nature of the verbal interaction but had remained occupied with their own calculations. Peripherally, they had been aware of my behaviour but had carried on working. Karen reported feeling puzzled by my behaviour but not discouraged from continuing work.

We discussed some of the strategies we use for seeking or avoiding closure during other social interactions, particularly when we want to gain and keep someone's attention (in a nightclub or party) and how different that can feel from our performance in the classroom. Several students reported a realisation that their pedagogy focused on closing down exchanges and activities quickly, carefully shaping classroom dialogue so as to provoke learners into uttering the 'right' answer so that the lesson could 'move on'. Some members of the group reported that swift closure was an (often unstated) objective of their teaching. An underlying assumption seemed to be that moving quickly towards closure is of the essence, with the main purpose of working with learners being to reach a conclusion, demonstrate a point, then move swiftly on.

At the outset, it had been assumed that my purpose during this mathematical activity would be to help them find an answer as quickly as possible. My point, admittedly not discussed adequately with them at the time, but condensed later following time for reflection, is that our own need as teacher/leader to feel safe within the group is a major factor in determining how we employ group activity in classrooms. In itself this is a fairly self-evident statement, but its simplicity belies the difficulty that teachers have in paying attention to their emotions in a range of group settings, especially when things are not going to plan, or when new approaches are being encouraged by school mentors or university tutors.

If we are to expand our repertoire and introduce new group work styles then our own anxieties need to be anticipated and to some extent worked through as part of our preparation. In the moment, some of us can remain very unaware of our own discomfort, whilst being swamped by the anxiety of others. This is a huge distraction when working with groups. Afterwards, when our own anxieties can be more keenly sensed, we might evaluate the session as terrible and our performance useless – irrespective of the group's feedback. For student teachers, the group is a very potent source of threat and anxiety, with threats and anxieties emerging from unexpected quarters:

- unanticipated personal questions (Are you married? Do you have a girlfriend/boyfriend? Can I live with you? Can I go home with you after school?)
- questions related to subject knowledge where we lack confidence
- the expectation that we should be totally responsible for another's learning (We've had two lessons on this topic but I still don't understand it at all.)
- tears and other forms of anxiety and distress emanating from members of the group in relation to factors beyond the lesson
- lack of eye contact (when a pupil's gaze is directed out of the window for example, rather than at the teacher)
- too much eye contact (Why do they always stare, I feel like I'm being undressed)
- long unanticipated silences.

A psychodynamic perspective argues that our own response to groups is shaped by our earliest experiences of being in the family group. To some extent all our later experiences of group interactions contain echoes of our earliest group experiences. Our responses are shaped by what we have learned to love and fear in relation to our earliest group experiences.

My desire to shift paradigms was prompted by a view that within western cultures in particular, the twentieth century obsession of focusing on the individual as the paramount object of psychological study has marginalised and limited studies of the relational, both within education and beyond. Yet we know that learning takes place in the context of a relational dynamic, both informally and peripherally between actors in groups, as well as through the more formal discourses in which learners and teachers engage in classrooms.

Within mainstream schooling we currently lack a sufficiently robust language for exploring group processes, particularly in regards to the relational and the unconscious processes that shape classroom dynamics. Perhaps the most significant difference between a constructivist psychology focused on individual learning and a psychodynamic psychology is that the latter demands acknowledgement of the centrality of self-other relations. It does seem to me that to use a psychodynamic lens rather than an exclusively constructivist – even a social constructivist – one allows us to pursue more fruitfully our understanding of learning and to place the relational at the centre of the learning process. Additionally, a psychodynamic perspective offers us a language for exploring resistance to learning and the disturbance this causes. Everywhere we cast our professional gaze we see examples of resistance to learning, both within ourselves and in others. We need a discourse that takes us beyond discussion of motivation, control, reward, grades, carrot and stick and gold stars.

I see mathematics as being particularly rich for exploring the relational. Mathematical symbolism appears to be sufficiently abstract and generalisable for us to reveal aspects of our inner world through the unconscious attachment of metonymic signifiers to mathematical symbols. Mathematics and the discourses around mathematical activity can become invested with meanings that relate directly to the unconscious. Because of its symbolic nature and its power of abstract representation, mathematics appears to be a natural vehicle for representing our unconscious responses to the anxiety that 'education' provokes – our fears of what we might have to lose in order to become educated.

Notes

[1] Pourquoi les filles sont-elles craintives en calcul?
Les filles sont plus craintives en calcul parce qu'elle réussissent moins bien (p. 14).

[2] Le plus souvent, c'est ma sœur qui me corrige l'algèbre […] Bon, je fais une étourderie, une petite étourderie en algèbre, elle me donne deux autres exercices […] si elle est vraiment occupée à ce moment-là, je vais vers ma mère. Pour la géométrie, c'est vers ma mère que je vais ou vers mon père (Blanchard-Laville, 2002, p. 48).

[3] J: Bon, je voulais aujourd'hui qu'on parle de … un peu de révision, parce que demain, bon ben, on va faire un contrôle sur tout ce qu'on a pu faire depuis … depuis la rentrée. Euh, bon, en algèbre que j'ai très bien compris, ça va. Bon, je mélange un peu, quelquefois, mais je commence à m'habituer entre les additions et multiplications. Euh, à part ça, ça va …

I: Quand tu dis qu'en algèbre tu confonds la multiplication et l'addition, est-ce que tu pourrais préciser?

J: Je veux dire que, bon, je sais que si on a un +, si on a un –, je sais que c'est le – qui l'emporte toujours et …

I: Pour l'addition ou pour la multiplication?

J: Pour l'addition. Et quelquefois dans les multiplications, on a les signes –, +, –, et après, entre, on a les, le signe ×, quelquefois, mais pas souvent, et quelquefois je mélange un peu. Mais à part ça, ça va, très très bien.

I: Mais quand tu dis que, dans l'addition, c'est toujours le – qui l'emporte …

J: Ben, je veux, ça dépend, si c'est deux bon …

I: S'il y a un – et un +, par exemple.

J: C'est celui qui aura le, le plus grand résultat en – qui remporte, mais mes parents m'ont appris une règle et, bon, dès que je rencontre un – et un +, bon, je sais que c'est le – qui sera avant, mais ça dépend quelquefois (Blanchard-Laville, 2002, pp. 50-51).

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