

AN AFFECTIVE LENS FOR TENSIONS EMERGING FROM TEACHER PROFESSIONAL DEVELOPMENT

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Lacey is a primary school teacher with five years of teaching experience. We met her during a professional development session led by one of the authors, after which she agreed to be interviewed. Having been asked to describe her school and her relationship with her colleagues, her students as well as the parents, she shares in her narrative that she has been “pressured” many times by parents to have tests. She also states, “a lot of the parents seem to think that if their children know how to do multiplication in grade one, they are exceeding [expectations] in math.” Lacey, especially after having attended the professional development session, places little value in memorising and tends to focus on the process of understanding rather than the product. We see that a tension is emerging in Lacey’s words, namely a conflict between two “competing and worthwhile aims” (Ball, 1993, p. 193). On one side, parents consider memorised multiplication facts as “kind of the bar” by which they measure their child’s ability. On the other side, Lacey is unwilling to alter her pedagogy. A conflict between different views of mathematics is reflected in the tension between mathematics as skills and mathematics as sense-making.

For teachers, engagement with professional development may cause tensions to emerge as they transpose their professional learning to their classrooms (Neumayer-DePiper, 2013) and a *tension* appears to be much more than simply a conflict: it is rather “a situation in which a perfect solution is not available” (Katz & Raths, 1992, p. 376). Lacey tells us that she chose to explain her actions to some of her parents, but she also adds that she suspects that some parents give tests to their children at home—as if they do not trust her. Tensions with parents can be considered as laying at the intersection (Neumayer-DePiper, 2013) of mathematics teaching and social issues, since parents hold views of mathematics and its learning, which contrast with non-traditional teaching practices that particularly emerge from professional development sessions. Tensions arise when faced with the difficulty of having to choose between at least two forces of equal importance, as choosing one necessarily excludes the others. Lacey’s case also shows that an (at least, apparently) unsolvable conflict between two contrasting views of mathematics might be ‘solved’, at least to a certain extent. Lacey, indeed, has to live with the tension that some parents may give tests at home. We can find, in literature, a description of tensions that fit within this example: tensions have been described by Berry (2007a) as “the feelings of internal turmoil experienced by teachers as they [find] themselves pulled in different directions by competing pedagogical

demands in their work” (p. 119). In the case of Lacey, she has to compromise between her view of teaching mathematics and some parents’ practices that go in opposite directions.

The story of Lacey is paradigmatic of some fundamental features of tensions that have been captured by previous research and, at the same time, it highlights some critical aspects of research about teacher tensions. For example, literature posits teacher tensions as dilemmas between two forces of equal importance: is it always the case? Some scholars, like Lampert (1985), characterise teachers as dilemma managers, as they have to cope with internal conflicts about two or more *incompatible* options. Our data, however, tell us that in some cases tensions can be solved. Additionally, Berry (2007a) focuses on the internal turmoil that such a dilemma causes inside the teacher, but affective issues related to teacher tensions provoked by professional development, and their role in effecting teacher change, is left unexplored. We, conversely, believe that it is the nature of such an emotional strain that plays a key role in the transition from professional learning to teachers’ classrooms. An affective lens on tensions to examine how teachers accept or resist change is, to us, a means of understanding many of the open issues related to teacher education.

Tensions and emotions

Teachers experience a variety of emotions in their practice. This emotional investment can result in tensions when their practice is challenged, or new expectations are imposed (Kelchtermans, 1996). Being related to professional dilemmas, teachers’ tensions elicit strong emotions. Hence, emotions and tensions are inextricably intertwined, and we have to consider emotions to understand tensions. Malmivuori (2006) argues that complex emotions arise in events that are relevant to important goals or concerns. Emotions constitute a feedback system for goal-directed behaviour, and thus shape a person’s choices. In our view, emotions, cognition and actions are strongly intertwined and inseparable: it is necessary to consider their relationship in order to understand behaviour. Emotions are not only a by-product of a teacher’s choices, but they guide, influence and anticipate such choices.

Berry (2007b) presents a tension framework developed in a self-study of her role as a teacher-educator that resulted in the following pairs of interconnected tensions: (a) telling and growth—between informing and creating opportunities to reflect and self-direct; (b) confidence and uncertainty—between exposing vulnerability as a teacher and maintaining

students' confidence in the teacher as a leader; (c) action and intent—between working towards a particular ideal and jeopardising that ideal by the approach chosen to attain it; (d) safety and challenge—between a constructive learning experience and an uncomfortable learning experience; (e) planning and being responsive—between planning for learning and responding to learning opportunities as they arise in practice. As part of a larger, ongoing project, of which this article is a part, we expanded Berry's framework by identifying new tension pairings, such as: (f) time and results—between immediate and long-term gains (Liljedahl, Andrà, Di Martino & Rouleau, 2015). In our view, tensions are pairs of contrasting forces that pull a teacher in two different directions. Our aim is to both identify the two forces at play in different cases, and to understand the emotional stances that characterise each tension.

In teachers' words

Our interest in characterising tensions led to an exploratory and qualitative approach that focused on explicating the tensions rather than quantifying their prevalence. Toward that end, we designed semi-structured interviews for teachers of different school levels who participated in professional development sessions with the authors. Some of them agreed to be interviewed orally, while others preferred to give written responses to the same interview questions. The interviews ranged from 30 to 60 minutes in length and were audio-recorded and transcribed. We report in this article excerpts from the oral interviews of five teachers and the written responses of four.

The structure of the interview aimed at letting tensions emerge through the narrative, asking the teachers to describe their school, the relationship with their colleagues and with parents, without explicitly referring to the tensions they lived. The use of narratives makes it possible to take into account those beliefs and emotions that are *psychologically central* for the teachers (Di Martino & Zan, 2015). During the interviews, self-reported emotions were annotated, while tensions needed to be inferred from teachers' words. If a teacher, for example, said that she was frustrated by the discrepancies between her students' need to have everything annotated on slides, and her desire for more open, problem-solving activities in her mathematics classroom, we annotated the (self-reported) emotion *frustration*, then we inferred a (self-reported as well) tension pair. As DeBellis and Goldin (2006) point out emotional meanings are often unconscious and difficult to verbalise, but like Evans, Morgan and Tsatsaroni (2006) we believe that textual analysis of teachers' narratives allows us to identify how emotional expressions function in teachers' positioning. We start by focusing on an emotionally laden word that emerged from Lacey's narrative and that characterises other teachers' narratives: *pressure*.

Pressure

In the case of Lacey, she felt pressure from her relationship with parents with respect to tests and drills. It was this pressure that shaped her choice to explain her view to the parents, but also, in order to avoid pressure, she tolerates the parents' actions at home. This feeling of pressure also sur-

faces when teachers talk about their tensions with mathematical assessment. In this context, pressure emerges again as a push to conform to the norms and standards that appear to conflict with pedagogical beliefs. We see this for example in Carlotta, another primary school teacher, in whose words it is clear that imposed assessment is lived as an obstacle potentially conflicting with her assessment goals:

I firmly believe that to assign a numerical rating to a child is extremely simplistic. Moreover, it does not help the child in her learning process. This is why every time I am obliged to assign the numerical rating (for example at the end of the school year) I go into crisis!

Carlotta's tension is rooted in the mismatch between her goal (coming from recent professional development) and the activity imposed upon her. This is echoed by a secondary school teacher, Elirose, who shares:

My major difficulties have been in comparing my way of assessing with the one that sometimes has been imposed, and other times proposed, by the school.

In this we note that not only parents, but also the school, may act as a barrier to a change. We see two conflicting and worthwhile aims at play: namely, the aim of being part of a school with certain rules and practices and the aim of transforming assessment so that it is an opportunity for the students to learn and engage.

Pressure is a specific emotion that caught our attention, since it appears several times in different teachers' narratives. Berry (2007b) characterises tensions as forces that pull the teacher in one direction or another. This evokes a physical image of centrifugal force. However, pressure evokes the opposite force—namely to be compressed by different contrasting forces. Do tensions push or pull? When a teacher feels pulled, she might feel herself spread in space, and when feeling compressed, it is as if she has not enough space. Interestingly, pressure emerges in assessment, and in relationship with parents, two contexts where teachers may feel that someone is invading their space and compressing it. It is interesting to consider the role of teacher experience in facing this kind of 'invasion'. Several teachers, in fact, mention feeling tensions with parents earlier in their careers, as Carolina describes, "At the beginning of my work experience as a teacher, parents had a strong influence on me. I was very insecure, and I was scared by discussions with parents." We met several teachers who told us that they too felt insecure and scared when they were young, and when they had to confront parents, they found a way to engage in dialogue with them, to share and explain their pedagogical choices. Others tried to avoid the conflict by changing some behaviour, like Anna who said that she learned to have something written on the students' notebooks every day, to show parents that some "work" has been done.

Other emotions

For Lacey, we see another emotion appear as tensions arise when it is suggested she randomly group her students, which conflicted with her method of creating the groupings herself. She explains, "When [the facilitator] asked me to do random groupings the first time, I really didn't think it was going to

go well.” Mentioning being “stuck” on her preference for creating her own strategic groupings, her belief was that random groupings would “be a big mess” as she did not feel certain students would work well together. We suggest that Lacey was anticipating a loss of control as she envisioned the chaos that would ensue. For Lacey, choosing her own groupings provides a climate of safety in her classroom that is necessary for learning to take place, while random groups are seen as a form of pedagogy intended to challenge her thinking about teaching and learning. Lacey is struggling with the worry that this new practice would limit her students’ opportunities to engage in mathematics, or in particular mathematical practices (see also Neumayer-DePiper, 2013). Lacey, however, allows herself to be challenged and the result of her attempt is perceived as very positive: “I tried it. They were all working together really well and it totally surprised me.” Along with control, this suggests another area of importance for Lacey is effective learning. The emotions that highlight Lacey’s tensions move from being *stuck* to being *surprised*. We view *stuck* as an emotional attachment to her traditional groupings, but also as being in between two worthwhile aims: on one hand, to trust the facilitator and try something new, but on the other hand not to decrease effective learning just for the sake of trying something different. She is *surprised* when the implementation succeeds, namely when she figures out that learning was much more effective than she expected, and positive emotions spread in the classroom: “I noticed such a change in the room, everybody was engaged.”

Michela is another primary school teacher and in her written response we find a similar shifting of emotions. Noting that, “trying to put into practice what emerges in a professional development course is usually very hard” Michela shares an account of being asked by the facilitator of her professional development session to give up student note-taking in her classroom. She emphatically states: “my notebook of mathematical rules was my staple.” Recognising that she was being asked to “abandon certain well-established approaches in order to give space to other new approaches”, she shares that it created “confusion and uncertainty”. She ends the account by sharing that, “to give it up was initially traumatic.” As with Lacey’s implementation, we see a tension between a safe practice where students had opportunities to learn mathematics by recording relevant facts during the lesson, and a new one, where possible learning outcomes are less certain. However, her use of the word “initially” suggests that her emotions (hard, traumatic) regarding the tension have lessened somewhat. A central role in the emerging of this tension—related to the emotional charge of a significant change in personal teaching habits—is played by the teacher’s self-perception in mathematics.

The adjective *stuck*, which surfaces in Lacey’s and Michela’s accounts, points to an emotional state of attachment. In teachers’ narratives, it emerges along with the theme of control. For Berlak and Berlak (1981), control is very central, not only to individual teachers, but to the school system itself. In our data it seems that, as long as one is stuck in her need to control everything, no change can occur. Allowing herself to lose some control, Lacey was taken by surprise during her implementation of random

groupings as she had low expectations for its success. For teachers like Lacey, it is only when they allow themselves to let go, are they released from their unhappiness.

In their interviews, teachers mention several tensions related to the constraints of mathematics curriculum, but interestingly, they were from seemingly opposite ends of the spectrum. Viviane and Eric are two secondary school mathematics teachers with 10 and 15 years of teaching experience, and both them shared tensions from too much curriculum, after having attended a professional development session focusing on mathematics as sense-making rather than learning a lot of facts. Anna, conversely, felt a tension in being limited by her grade specific curriculum. She is a primary school teacher and says she struggled with the limitations of “This is grade one, this is grade two. You don’t teach grade two in grade one.” Keeping within the boundaries of her grade’s curriculum became more difficult when she began to incorporate a problem-solving based pedagogy. She says, “It’s not like I’m implicitly teaching them. It’s just now that we’re doing problem-solving activities or now they’ll be introduced new strategies, it just naturally comes out.” This tension, specific to mathematics teaching, between mathematics as skills and as sense-making, also emerged in Neumayer-DePiper (2013). Anna’s tension arises from her feeling that she was holding some of her students back, “I didn’t know grade ones can go beyond the curriculum, beyond grade one. And eat up grade two material, you know.” A mathematics-specific tension is, thus, linked to general pedagogical practices, which in turn can constrain students’ learning opportunities. We notice that in this excerpt Anna does not explicitly mention any emotion.

In Eric and Viviane we find tensions from having too much prescribed curriculum, which contrasts with deep learning. Eric shares, “I think I’ve always felt the pressure. I felt I had to teach them everything, make sure I didn’t miss anything.” A proposed new curriculum implementation has allowed Eric to shift his focus from “just teaching a lot of stuff” to finding a goal—what he calls, “a small idea of what can we connect it to. So there’s just always something central in what we’re doing today. Something that grows.” We see a tension between two views of mathematics and its learning: namely, between mathematics as a list of concepts and mathematics as a sense-making activity. We also see a tension between teaching as transmitting “a lot of stuff” and teaching as connecting ideas. For Viviane, curriculum changes have increased her tensions instead of relieving them as she notes, “The curriculum required by the new national programs asks for too many topics to teach.” Tensions between time and results emerge from the unrealistically high expectations from curriculum and the frustration this causes her. This is implied in her statement that “there is too much discrepancy between what is required and what is actually possible to do in a classroom at an average level.” Her tension involves the distinction between intended curriculum and “implementable” curriculum. She feels that the changes lead to superficial teaching “even if the final, national examinations require a high degree of depth.” We gain a sense that Viviane feels she is being set up to fail.

The feeling of being under pressure emerges again in these teachers’ accounts. Both Viviane’s and Eric’s narratives

about curriculum changes give the idea that too much “stuff” is invading their classrooms, as if they have to put too many “things” in their teaching agenda. We also get a sense that they are trying to find a degree of freedom for moving within this “invaded” space. A similar sense of “invasion” can be found in Anna’s class, where grade two curriculum invades her grade one program. A possible counterpart of pressure is *confusion*, when teachers do not have to add anything to their teaching agenda, whilst they are invited to change some established practice (students’ grouping, students’ notes, curriculum). Hence, an emotion that may go along with lifelong learning is feeling of being lost in space (*i.e.*, confusion), rather than being safely within one’s comfort zone. In Lacey’s account for random grouping, chaos or confusion is the expected outcome from her change and this causes her to be stuck. Michela more explicitly tells us that it was very difficult to give up an established practice and her words reveal just how hard it was for her. Anna was truly convinced that grade ones cannot “eat up” grade two’s material. At the beginning of their narratives, we sense that all the three teachers are somehow blocked. Lacey and Anna, however, were taken by surprise when they tried the novelty and figured out how well it works. These three teachers put themselves outside their respective comfort zones, they trusted their instructors, and their space was broadened—to their surprise. This is quite the opposite of Viviane’s and Eric’s situation, where a sense of suffocation comes out. We do not get the impression that Viviane and Eric are outside of their comfort zone. This suggests a spectrum of possibilities for teachers confronted with innovation in teaching and it seems that professional development experiences that broaden their perspectives (change grouping strategies, give up note-taking) occasion more effective change when compared with situations where they have the feeling of being invaded (curriculum requirements).

The last emotion we mention is *surprise*. In our data, the teacher, Lacey, who experienced surprise had positive feedback about the new practice she was initially reluctant to introduce in the classroom. This positive emotion reinforced her ongoing process of change. This episode in our data allows us to formulate two kinds of considerations: one on the relationship between positive emotions and willingness to change, and the other one on the nature of change itself. As regards the former, psychologists postulate that positive emotions enable human flourishing and optimal functioning (see Güsewell & Ruch, 2012). The latter allows us to see change as a process, not as an instantaneous switch on/switch off; it is a process that comprises ups and downs. Studies like Güsewell and Ruch teach us that positive emotions are necessary for the change to endure. So, if it is true that initial negative emotions (associated with tensions) provoke change, we also note that positive emotions should be experienced by the teachers in order to keep the change alive.

Further thoughts

As Brown and Reid (2006) stress, part of our work as mathematics teacher educators is to encourage teachers’ reflection on their own actions, didactical choices and feelings associated with these actions and choices. For mathematics teacher education, then, a specific focus on ten-

sion is crucial since traditional approaches to reasoning required the suppression of emotions or the control of them (Zan, Brown, Evans & Hannula, 2006). We add that, as teacher educators, our role is not only to tell teachers that a certain practice is ‘good’ for some ‘good reasons’. For change to be effective, our role is not only to broaden a teacher’s perspective, but also to support her when she does. This would necessarily occasion tensions, as many contributions in literature have pointed out, but our teachers’ narratives reveal that it is important for the teacher educator to understand how a teacher is managing the tensions and which choices she is undertaking.

In expressing their emotions connected to tensions, the teachers often first presented negative emotions. Since tensions are understood as the engine of change, it seems that negative emotional dispositions are a necessary step to provoke professional development and growth, foster dialogue with parents, or allow the teacher to introduce problem-based pedagogy. We acknowledge that there exist cases of teachers who come to professional development and have negative emotional reactions that lead them to disengage. Our small sample does not capture this aspect, as our teachers have been interviewed after having attended professional development. Tensions of teachers who abandon professional development before its end need further, specific investigation.

Our affective lens also takes into account teachers’ beliefs. In Michela, Anna and Lacey beliefs act as a barrier to change: for Michela it is hard to give away students’ note-taking, Anna believes that grade one students cannot eat up grade two math and Lacey is sceptical about random grouping. The relationship between beliefs and resistance to change is not as linear as it is claimed in the literature: for two other teachers it is the other way around, namely their beliefs do promote change. Tensions illuminate a non-trivial relationship between beliefs and change, which needs further exploration.

Finally, this article does not take into account a kind of tensions that can be of particular interest for a future study, namely: the tensions that bring the teachers to professional development. From our direct experience, we know that teachers come to professional development in order to alleviate their tensions, and sometimes we create new tensions in professional development. The picture that we see from the interviews is not, however, one of teachers who are ‘prisoners’ of their own tensions. It is, in contrast, one of teachers who are taken by surprise. In some stories, teachers struggle. The majority of their stories are stories of success. We might say that tensions are worth being considered beyond our research imperatives, since provoking tensions, talking about tensions and managing tensions are effective ways to promote teachers’ professional development.

References

- Ball, D. (1993) With an eye on the mathematical horizon: dilemmas of teaching elementary school mathematics. *The Elementary School Journal* 93(4), 373–397.
- Berlak, A. & Berlak, H. (1981) *The Dilemmas of Schooling*. London: Methuen.
- Berry, A. (2007a) Reconceptualizing teacher educator knowledge as tensions: exploring the tension between valuing and reconstructing

- experience. *Studying Teacher Education* 3(2), 117–134.
- Berry, A. (2007b) *Tensions in Teaching about Teaching: Understanding Practice as a Teacher Educator*. Dordrecht: Springer.
- Brown, L. & Reid, D. (2006) Embodied cognition: somatic markers, purposes and emotional orientations. *Educational Studies in Mathematics* 63(2), 179–192.
- DeBellis, V. & Goldin, G. (2006) Affect and meta-affect in mathematical problem solving: a representational perspective. *Educational Studies in Mathematics* 63(2), 131–147.
- Di Martino, P. & Zan, R. (2015) The construct of attitude in mathematics education. In Roesken-Winter, B. & Bepin, B. (Eds.) *From Beliefs to Dynamic Affect Systems in Mathematics Education*, pp. 51–72. Zurich: Springer.
- Evans, J., Morgan, C. & Tsatsaroni, A. (2006) Discursive positioning and emotion in school mathematics practice. *Educational Studies in Mathematics* 63(2), 209–226.
- Güsewell, A. & Ruch, W. (2012) Are only emotional strengths emotional? Character strengths and disposition to positive emotions. *Applied Psychology: Health and Well-being* 4(2), 218–239.
- Katz, L. & Rath, J. (1992) Six dilemmas in teacher education. *Journal of Teacher Education* 43(5), 376–385.
- Kelchtermans, G. (1996) Teacher vulnerability: understanding its moral and political roots. *Cambridge Journal of Education* 26(3), 307–323.
- Lampert, M. (1985) How do teachers manage to teach? Perspectives on problems in practice. *Harvard Educational Review* 55(2), 178–195.
- Liljedahl, P., Andrà, C., Di Martino, P. & Rouleau, A. (2015) Teacher tension: important considerations for understanding teachers' actions, intentions, and professional growth needs. In Beswick, K., Fielding-Wells, J. & Muir, T. (Eds.) *Proceedings of the 39th Meeting of the International Group for the Psychology of Mathematics Education*, Vol 2, pp. 193–200. Hobart, Australia: PME.
- Malmivuori, L. (2006) Affect and self-regulation. *Educational Studies in Mathematics* 63(2), 149–164.
- Neumayer-DePiper, J. (2013) Teacher identity work in mathematics teacher education. *For the Learning of Mathematics* 33(1), 9–15.
- Zan, R., Brown, L., Evans, J. & Hannula, M. (2006) Affect in mathematics education: an introduction. *Educational Studies in Mathematics* 63(2), 113–121.

Felix Klein and Hans Freudenthal Awards: call for nominations

Since 2003, the International Commission on Mathematical Instruction (ICMI) awards biannually two medals, the Felix Klein Award and the Hans Freudenthal Award, to recognise outstanding accomplishments in mathematics education research.

The Felix Klein medal is awarded for life-time achievement in mathematics education research. This award is aimed at acknowledging those excellent senior scholars who have made a field-defining contribution over their professional life.

The Hans Freudenthal medal is aimed at acknowledging the outstanding contributions of an individual's theoretically robust and highly coherent research programme. It honours a scholar who has initiated a new research programme and has brought it to maturation over the past ten years.

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Nominations for the Felix Klein Award should include the following:

- 1) a document (max. 8 pages) describing the achievements of the nominee (*e.g.*, his or her theoretical contribution and/or empirical research, leadership roles, graduate supervision and mentoring, and peer recognition) and reasons for the nomination (including a description of the nominee's impact on the field);
- 2) a one-page summarizing statement;

- 3) a curriculum vitae of the nominee (max. 20 pages);
- 4) electronic copies of three of the nominee's key publications;
- 5) three letters of support (preferably from different countries); and
- 6) the names and e-mail addresses of two persons other than the nominee herself or himself who could provide further information, if needed.

Nominations for the Hans Freudenthal Award should include the following:

- 1) a document (max. 5 pages) describing the nominee's research program and reasons for the nomination (including a description of the nominee's impact on the field);
- 2) a one-page summarizing statement;
- 3) a curriculum vitae of the nominee (max. 10 pages);
- 4) electronic copies of three of the nominee's key publications;
- 5) three letters of support (from different countries, if possible); and
- 6) the names and e-mail addresses of two persons other than the nominee herself or himself who could provide further information, if needed.

All nominations must be sent by e-mail to the Chair of the Committee (annasd@edu.haifa.ac.il, sfard@netvision.net.il) no later than 30 April 2019.

See also the announcement of the Emma Castelnuovo Award on page 47.
