Nonviolent communication, compassion and mathematical resilience.

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We consider mathematics anxiety to be a result of cultural violence. We explore the possibilities offered by Marshall Rosenberg's nonviolent (compassionate) communication (NVC), developed as a means of addressing conflict, to contribute to the existing work on mathematical resilience (MR), which seeks to address mathematics anxiety and avoidance. Nonviolent communication assumes that compassion is innate, that human behaviour comes from needs, which are indicated by feelings, and stresses the importance of empathy. This resonates with MR, and in particular validates the Growth Zone Model, an important and successful MR strategy involving the non-judgmental awareness and articulation of feelings and needs and the link between these.

Mathematical resilience, mathematics anxiety, nonviolent communication, compassion, empathy, human needs, emotion

Introduction

For most people, violence is assumed to be physical. In this article, we extend the definition to include emotional violence in order to explore the pervasive phenomenon of maths anxiety. Many mathematics classrooms are perceived as calm, orderly places. However, mathematics classrooms are produced by discourse (Foucault, 1990), created through practices that produce what is taken for granted as normal, defining what can be thought, said and done. We see classrooms as peaceful because we are living within a particular discourse, often blind to what is causing maths anxiety. Galtung, a major figure in peace studies, defines violence as follows:

> Violence is any avoidable insult to basic human needs [survival, well-being, freedom, and identity] … Violence to human beings hurts and harms body, mind and spirit. … Violence leaves deep wounds, trauma, that is difficult to heal. Violence to the mind takes the form of distorted cognitions and emotions, and to the spirit the form of hopelessness … (Galtung, 2013, p 35)

Thus, based on the stories of those who have developed maths anxiety, we claim that classrooms are indeed sometimes experienced as places of violence. For example, an adult learner might remember vividly being in front of the whole class as a child and the teacher calling them stupid (Cousins et al., 2018). We consider maths anxiety, of which much has been written (for example, Dowker, Sarkar, & Looi, 2016), as a symptom of harm to a learner's wellbeing and to their identity in the context of mathematics. We make connections with Galtung's notion of deep wounds, apparently difficult to heal, and how people who are maths anxious may become hopeless, helpless or avoidant of maths, or may start acting out.

However, many teachers see maths anxiety as inevitable – or do not see it at all. Although some teachers may act in ways that are directly harmful to students, most teachers would be disturbed by the idea of violence within their classroom. Here Galtung's notions of structural and cultural violence are important:

> The subject of violence can be any actor, as in intended actor or *direct violence*. Or, a structure at work, churning out harm, causing basic human needs deficits, as in un-intended, indirect, or *structural violence*. Or, culture at work when used to legitimize direct and structural violence, the legitimation then being indirect-direct/indirect, or *cultural violence*. (Galtung & Fischer, 2013, p.35)

While teachers, peers, parents, or even the student themself can be the subject of direct violence, much of the violence comes from the structure – and from the culture – a discourse which legitimates such violence. Maths anxiety is a symptom of psychological injury caused by *cultural violence*; some of the cultural conditions under which people learn mathematics cause harm to a sizeable minority of the population. Teachers are constrained both by overt pressures such as the need to produce results for league tables, and by constraints due to unquestioned beliefs – an important one being that students' ability in mathematics is fixed. Teachers are also constrained by the invisibility of mathematics anxiety.

Foucault (1990) claims that, although the power exercised by a discourse constitutes and constrains what is possible, it does not fully determine it, giving hope that teachers may also resist discourses. In this paper, we introduce an approach to conflict-resolution known as nonviolent communication and link this to existing work in mathematical resilience (MR), defined as maintaining self-efficacy in the face of personal or social threat to mathematical wellbeing (Lee &Johnston-Wilder, 2017). This link legitimizes the effectiveness of the existing work and offers new possibilities for thoughts, words and action within the classroom.

Nonviolent Communication

The practice known as nonviolent communication (or NVC) was developed by Marshall Rosenberg (Rosenberg, 2015), a clinical psychologist, who worked with Carl Rogers in exploring helping relationships, and who was influenced by the ideas of Gandhi. An alternative name for nonviolent communication is compassionate communication. NVC involves four basic assumptions.

Assumption 1: humans are compassionate by nature

The first assumption is that compassion, "giving from the heart", is natural and innate. Such an assumption was radical in the 1960s when Rosenberg's work began, contrasting strongly with religious beliefs about "original sin" and also the understanding of Darwinism as "survival of the most selfish". It is less radical today. Modern interpretations of Darwin note his emphasis on "sympathy" and his analysis of how this might have developed through natural selection (Ekman, 2010). There is also substantial research evidence of compassion in infants (e.g. Tomasello, 2019) and an increasing recognition that the ability to cooperate has been fundamental to the development of human society. An implication for MR is that the natural compassion of teachers is being thwarted in some way when students suffer and that strategies are required to enable teachers to deal with the structural and cultural constraints that make compassionate behaviour in mathematics classrooms more difficult.

Assumption 2: all human actions come from needs.

Another fundamental NVC assumption is that all human actions are attempts to meet needs, successfully or not (Bond, 2018), which creates commonality in contrast to explaining human actions as right/wrong, good/bad, and making should/shouldn't

judgements. One of the theories which bases human action on needs, self-determination theory (Deci & Ryan, 2000), has been used in mathematics education research and identifies many of the same needs (competence, autonomy, and relatedness) as does Rosenberg. An implication for MR is that learners who are avoiding maths or misbehaving are attempting to meet their needs, one of which is the need to keep safe from the perceived threat of mathematics. Learners will also only learn mathematics to meet their needs – but the needs being met may be about approval rather than growth, understanding, or clarity.

Assumption 3: feelings are a means of identifying needs

Giving us information about our needs (which can otherwise be hard to identify) is seen as the primary function of feelings. This is not a link that we have found explicitly made in the mathematics education literature. MR has strongly identified the value and importance of feelings in mathematics classrooms and has made some tacit links between feelings and needs. However, further links are likely to be made, as a wider range of feelings and needs are identified and explored.

Assumption 4: empathy needs to permeate

In describing the importance of empathy, Rosenberg quotes Carl Rogers:

> "When someone really hears you without passing judgment on you, without trying to take responsibility for you, without trying to mold you, it feels damn good!... When I have been listened to and when I have been heard, I am able to reperceive my world in a new way and to go on. (Rosenberg, 2015, location 2143)

Empathy involves hearing and recognising another person's thoughts, feelings and needs with respect. Empathy creates the safe space in which people can become aware of their feelings and needs – even if these needs cannot be met at that time. MR likewise recognises the importance of empathy and uses Baron-Cohen's (2002) distinction between systemizing (focusing on analysis of rules and patterns), and empathizing (recognising another person's perspective and emotions and responding appropriately), suggesting that many mathematics teachers are more comfortable with systemizing and hence may find it more difficult to develop skills in empathizing.

NVC in practice

> When I first started studying compassionate consciousness, I was amazed at how simple it was. This was immediately followed by my amazement of how difficult it was. How could something so simple be so hard? (Bond, 2018, location 749)

NVC involves ideas and actions that do not fit our prevailing discourses and are hence not easy to put into practice. Some cultures do not always encourage articulation of feelings and needs; they may be judged as "bad" and people may be frightened of being overwhelmed by their own needs and feelings and those of others. Rosenberg introduced a number of practices to support the transition to compassionate consciousness, but we feel that what is most important from NVC is to develop empathy, including self-empathy, and make visible and validate learners' (and our own) feelings, needs and the link between these in order to communicate in ways that lead to more of a learner's needs being met. Although seemingly simple, this is not straightforward. Secondary teachers might feel helpless when confronted by a child crying in their classroom: primary teachers have learned ways of responding to this with empathy and appropriate support.

Mathematical Resilience

The research into mathematical resilience focuses on enabling the learner to develop a positive stance, and to hold onto it, to manage their emotions, to develop a "can-do" growth mindset, and to assemble support and coping skills when needed.

Fixed vs Growth mindset

Growth mindset teaching is now prevalent in the UK; however, fixed mindsets in respect of mathematics are also prevalent. For example, the teacher who believes (and possibly communicates) that a particular child will never be any good at maths is demonstrating a fixed mindset in relation to mathematics. In contrast, teachers and students with a growth mindset believe that, with effort and support, becoming better at mathematics continues to be possible. NVC puts forward that beliefs are also attempts to meet needs. Is the teacher who tells the child that they are no good at maths acting to meet their need for efficacy and respect in the moment, or to cover their perceived lack of time or training? Is the child who refuses to make an effort with mathematics acting to meet their need for safety? Part of NVC involves becoming aware of one's beliefs, recognising the needs that these beliefs meet and considering whether there are alternatives that might better meet our needs as a whole.

Persisting, persevering and recruiting support when stuck

Maths resilience includes knowing what to do when stuck. NVC affirms that needing support is not a weakness, but rather a basic human need. On the other hand, NVC allows that someone may say "no" to a request for support, for example, refusing to directly answer a question. Instead of answering a question directly, a teacher may recognise the learner's need for more agency and autonomy and instead encourage the learner to explore alternative ways of becoming unstuck.

Some support will also come from being part of a classroom community, in which learners have suggested rules such as not laughing at mistakes and listening to each other in order to create safe space for learning (e.g. Johnston-Wilder & Moreton, 2018). This fits the NVC practice of becoming aware of and exploring strategies to meet the needs of all and also acknowledges the need for social connections and the need to contribute to the well-being of others.

Growth zone model

The growth zone model (Figure 1) is a simple tool which both reveals hidden maths anxiety and also enables the development of empathetic communication.

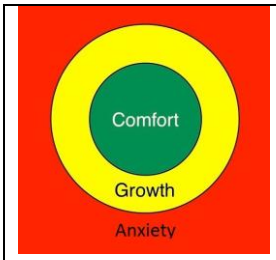	Each learner has a piece of paper showing this diagram and a coin to place in the zone that represents their current state. When, for example, a teacher asks a question and a learner does not respond, a glance at the learner's model will immediately give the awareness that the learner is temporarily not in a place to answer the question, whether they need to calm down if in red, or need to be encouraged if in green.

Figure 1 The Growth Zone Model

Or if a teaching assistant approaches a child, and notices that their coin is in the red zone, the teaching assistant knows not to talk about maths at that point, but to talk about recovery and how to stop panicking. Only if the coin is in the green or amber zone is it okay to talk about the maths. Importantly, in terms of NVC, using the model by placing a coin is a non-judgemental process. The learner hence develops both self-awareness and self-empathy. The teacher likewise develops awareness and empathy. Anxiety is made visible; the teacher is able to respond with empathy rather than judgement. The teacher may also be surprised to find that some high-achieving students also experience anxiety!

The work done already with subgroups of maths teachers across all phases (Johnston-Wilder and Moreton, 2018; Lee, 2016) indicates that the model is accessible, teachers are very willing to try it, and it works, in that teachers notice learners become more willing to engage with challenge, and behaviour improves (as self-safeguarding diminishes). Importantly, once there is a solution, teachers become aware of the existence of the problem, and begin to see the connections between behaviour and anxiety.

Conclusion

We have made the claim that mathematics anxiety is a symptom of harm to a learner's well-being, caused by violence. Such violence is usually unintended and unnoticed, a product of a discourse which sees little alternative to mathematics anxiety. Our work in mathematical resilience takes seriously the injury that many learners have experienced, and claims that such injury can be avoided by empowering teachers and learners to resist the prevailing discourse. In this paper we have explored the potential of nonviolent communication, an internationally-used method of conflict resolution, to both legitimize and extend our practice.

NVC and MR share views about the importance of compassion and empathy. NVC's claim that compassion is innate enables belief that teachers will respond compassionately to learners if given ways to work within structures that otherwise do not prioritise the well-being of students. NVC's emphasis on empathy validates the way in which MR has been considering ways to move teachers from a predominantly systemizing approach to an empathizing approach. Both NVC and MR stress the importance of feelings. However, NVC makes a link between feelings and needs that has not yet been made explicit in MR, but which is implicit in the growth zone model (GZM). NVC gives us a reason why the GZM is so effective: it enables learners to identify and clearly communicate important feelings which have been linked to needs, and strategies are available to meet these needs.

We see this explicit link between feelings and needs as important in furthering MR. We would like to explore a fuller range of needs that a learner might have in a mathematics classroom and the ways in which mathematics might meet or act against these needs. One of us experienced anxiety memorising times tables in a competitive, speed-driven environment but later discovered that other learners of her generation had memorized times tables by chanting together as a group − and remembered the experience fondly. What needs were being met, or thwarted, in each experience?
NVC holds that beliefs, such as those concerning maths ability, are seen as attempts to meet needs. This gives us a way to become aware of and challenge many of the beliefs that we take for granted, such as those involved in the prevailing practice of setting or streaming in mathematics classrooms in the UK. Alderton and Gifford

(2018) give the telling Norwegian example of prohibiting permanent "ability" grouping in order to safeguard the pupils' need for social belonging.

NVC also gives us space to be gracious with ourselves when we make mistakes or discover lacks of awareness that we experience as upsetting or embarrassing. A teacher may feel ashamed to have spent many years not noticing or dismissing anxious learners in their class. Learning to communicate with compassion is seen as a lifelong journey - at every moment in time we are simply acting to meet our needs, which include needs to contribute to the lives of others, as best we can.

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