ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/usep20

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Published online: 12 Nov 2020.

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I'm not as bright as I used to be – pupils' meaning-making of reduced academic performance after trauma

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ABSTRACT

Post-traumatic stress disorder (PTSD) is associated with temporary, distinct cognitive impairment. This study explores how cognitive impaired academic performance is recognized and explained by young Norwegians who survived the Utøya massacre of July 22, 2011. Qualitative interviewing of 65 students (aged 16–29 years) was conducted 2.5 years after the traumatic event. A total of 25% (n = 16) respondents reported no or no distinct change; only 6% (n = 4) reported some degree of positive change. By contrast, 69% (n = 45) reported negative changes in academic performance, with impaired concentration and feelings of chaos. Previously effective study techniques became less effective or inadequate. Respondents worried about lasting impairment of academic functioning, but reported little or no discussion with teachers. From the characteristics of the changes reported, attribution style, the use of metaphors and narrative structuring, we identify differences in the meaning-making processes of these young people. Some were left with an understanding that negatively affected their help-seeking activity and reduced the willingness to accept adapted education post trauma.

Introduction

Traumatic stress and academic performance

Mass trauma events such as terrorist attacks and natural disasters may be unpredictable, take various forms, and create societal chaos and disruption (Pfefferbaum et al., 2014). Adolescents' reactions to such disasters vary. Although most adolescents do not develop psychiatric conditions as a result of their exposure to a potentially traumatic event, many experience levels of distress that tend to subside naturally over time (Alisic et al., 2014). An event is considered "potentially traumatic" when exposure includes direct or indirect experiences of actual or threatened death or serious injury; post-traumatic stress disorder (PTSD) is a potential outcome from traumatic exposure (American Psychiatric Association (APA), 2013). The complexity in disaster settings is challenging for professionals seeking to develop and deliver disaster interventions – they must consider the various characteristics and needs of the population in question as well as characteristics of the disaster itself (Pfefferbaum et al., 2014). Studies of terrorist attacks and natural disasters provide a growing research base for predicting reactions and symptom levels and the need for post-disaster follow-up – immediate and long-term. A review of 60,000 disaster victims from 160 samples

(Norris et al., 2002) found that school-age youth were more likely to be affected than adults. Further, exposure to events of mass violence such as terrorism and shooting sprees tended to result in higher symptom rates than the case with natural disasters. PTSD is among the most-observed post-disaster reactions among youth, followed by depression and anxiety, with prevalence varying according to the type and aspects of the disaster. In most samples in the Norris et al. meta-study, up to one third of school-age youths showed considerable PTSD symptoms post-disaster, generally peaking during the first year after exposure, followed by gradual improvement. However, for a significant minority of participants, symptoms lingered for months and years (Norris et al., 2002). Another meta-study of more than 3500 trauma-exposed children and adolescents showed an overall 15.9% rate of PTSD, varying according to the type of trauma and gender. Least at risk were boys who had experienced non-interpersonal trauma, such as natural disasters; most at risk were girls exposed to interpersonal trauma (Alisic et al., 2014).

The negative impact of trauma on cognition is increasingly recognized. A new symptom cluster, "Negative alterations in cognitions and mood" was included in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5: APA, 2013). In order to fulfill

the PTSD criteria, two out of seven items from this cluster needs to be identified. DSM-5 draws on a strong foundation of studies for describing categories of potential symptoms of traumatic stress – behavioral problems, cognitive implications, somatic distress, and psychological reactions – all of which might interfere with learning. Further, numerous studies on cognitive implications have shown PTSD to be associated with cognitive deficits leading to poor cognitive functioning. The neurocognitive domains most commonly affected are episodic memory, attention, executive functioning, and speed of information processing – with the severest effects observed in verbal immediate memory and attention/working memory (see Malarbi et al., 2016: Scott et al., 2015). PTSD-related cognitive deficits are generally described as mild, temporary cognitive impairment (APA, 2013).

Several studies have investigated how trauma influences academic performance and functioning. A systematic review of research from 1990 to 2015 (Perfect et al., 2016) included 83 quantitative studies, with the focus on school-related outcomes of trauma exposure and traumatic stress symptoms in students. The review found that youth with cumulative or severe exposure to traumatic events were at significant risk for impairments in cognitive functioning, academic difficulties, and social-emotional-behavioral problems (Perfect et al., 2016).

However, there has been less research on how changes in academic functioning are experienced by the students themselves, and how impaired academic performance can be dealt with within an educational context by providing educational interventions.

Meaning making

In this study we explore aspects of the context of being a young person in school after having experienced trauma. We employ a meaning-making approach to the qualitative data, investigating conceptualizations of reality through the narrative and metaphorical linguistic structures (see e.g., Bruner, 1990, 2005; Fauconnier & Turner, 2008; Lakoff & Johnson, 2003). These are frames for thinking that influence how we feel and act. The narrative structures events temporally, and includes most often concepts of reason and cause. Narrative and metaphorical schema form the cognitive basis of any meaning making. Under the broader term of "meaning making," the cognitive metaphor theorists Johnson, Lakoff and Turner have created a new phenomenological field in recent decades. They define the cognitive as "any mental operations and structures that are involved in language, meaning, perception, conceptual systems, and

reason" (Lakoff & Johnson, 1999, p. 13); the basic structures are narrative and metaphorical (Turner, 1996). Narrative psychology holds that, in terms of how we think and act, our ordinary conceptual system is fundamentally metaphorical in nature (Lakoff & Johnson, 2003; Polkinghorne, 2005). Our concepts structure what we perceive and how we relate to other people. We think and act rather automatically along certain lines, with the conceptual system playing a central role in defining our everyday realities (Lakoff & Johnson, 1999, 2003). Essentially, a metaphor involves understanding and experiencing one domain in terms of another, where we grasp the meaning through other concepts that we understand in clearer terms. Matters requiring metaphorical definitions are concepts that are not clearly defined in everyday language, such as emotions and abstract thinking (Lakoff & Johnson, 1999, 2003).

We tend to use two different categories of metaphors in our discourse – cognitive metaphors, which largely constitute our everyday language; and innovative, or poetic metaphors, which reflects creative capacity. Both types build on the human capacity to create similarities between two distinct domains or phenomena. However, cognitive metaphors are less products of innovative linguistic creativity: rather, they are building blocks in the linguistic system that constitute language and part of larger systems emanating from language (Lakoff & Johnson, 1999, 2003: Turner, 1996). Cognitive metaphors may have the opposite effect on our thinking than innovative metaphors. Instead of bringing new insights and creating new meanings and understandings, they may capture and lock our understanding in everyday thinking in accordance with widely shared "folk theories." To view metaphors as creative and innovative implies that some metaphors assist us in understanding aspects of reality that they themselves help to constitute (Black, 1996). Such innovative metaphors open up our thinking, enabling us to perceive reality in new ways.

The study presented here explores how school pupils exposed to a traumatic event have recognized and explained PTSD-imposed cognitive impairment as influencing their own academic performance. Characteristics of their meaning-making process are analyzed based on their use of differences in attributing self-observed changes in academic functioning, their narratives and the use of metaphors.

Method

Context

On July 22, 2011, a car bomb exploded outside the main government building in Oslo, Norway, killing eight

people and injuring more than 200. The perpetrator then headed for the small island of Utøya, where the youth organization of the Norwegian Labor Party was holding its annual summer camp. There he carried out a massacre that lasted for more than one hour. In all, 69 persons were killed, many were injured, and 56 were hospitalized.

In connection with the Utøya Research Program, 490 survivors and their parents were invited to participate in semi-structured face-to-face interviews conducted 4–5 months (wave 1), 14–15 months (wave 2), and 31–31 months (wave 3) after the massacre. (See Dyb et al., 2014 for details of this research program.) In the first wave, 325 participants were recruited, 245 of whom were part-time or full-time students. These survivors had been directly exposed to a life-threatening situation where they experienced extreme trauma, trapped on a small island of only 26 acres. All heard gunshots; most of them hid or ran from the terrorist (96.9%); many witnessed someone being injured or killed (64.1%) or saw dead bodies (86.7%). Furthermore, 96.3% reported having lost a friend, which indicates a high degree of bereavement and loss. Post-traumatic stress reactions in survivors were significantly associated with general mental-health problems, functional impairment, and reduced life satisfaction four to five months after the terrorist attack (Dyb et al., 2014). Symptoms above the clinical cutoff for PTSD were found in 22.0% of those interviewed at wave 1, 8.4% at wave 2, and 7.7% at wave 3. The proportion of those with clinical levels of anxiety and depression symptoms was 44.8% at wave 1, 29.1% at wave 2, and 24.5% at wave 3 (Stene et al., 2016).

Trauma reminders are a part of the diagnostic criteria for PTSD (DSM-5: APA, 2013). They are described as psychological distress and/or physiological reactions to cues that symbolize or resemble some aspect of the traumatic event. Findings from the second wave indicate that trauma reminders were common 14–15 months after the massacre: 33% reported experiencing at least one trauma reminder often or very often in recent months, whereas only 7.4% had not experienced any at all. Auditory reminders were reported to be especially frequent and distressing (Glad et al., 2016a). At the third wave, 2.5 years after the massacre, almost 20% of the survivors reported being very distressed by their worst memories of the event. Findings indicate that distressing reminders are relatively common and may play a central role in the development and persistence of PTSD (Glad et al., 2016b). Although 48.4% of the survivors rated their health as "excellent" or "very good" 2.5 years after the event, 37.7% said that their health had worsened; and 16.5% reported very high/high current need for help in dealing with psychological reactions (Stene et al., 2016).

The year following the attack a study investigated survivors' (N = 237) perceived academic performance and wellbeing, showing 61% (n = 143) reporting impaired academic performance and 29% (n = 66) impaired school wellbeing. Female survivors more often reported impaired performance. Sleep problems, post-traumatic stress, anxiety/depression, somatic symptoms, and lower life satisfaction were associated with both impaired academic performance and impaired wellbeing. The findings demonstrate how severe trauma can affect young survivors' academic performance and wellbeing at school (Stene et al., 2018). Another study investigated academic performance in survivors (N = 64) who had successfully completed their three-year senior high school program. Their registered grades were compared against the national grade point average, before and after the event. The results showed that academic performance was reduced in the year immediately after the traumatic event, but for students who completed high school successfully, the school situation improved two years after the traumatic event. These findings underscore the importance of keeping trauma-exposed students in school and providing longer-term support (Strøm et al., 2016).

Participants and procedures

For the study reported here, 68 participants were selected from the third wave (N = 261) of the Utøya research program. These 68 informants, selected as a purposive sample, were assigned to nine interviewers according to geographic proximity. Experiencing PTSD symptoms was not a selection criterion. Three pupils were omitted from the study because they had dropped out of school early. At the time of the interviews, respondents ranged in age from 16 to 29 years (mean age: 21): 38 males and 27 females. All 65 had been students (junior high school, senior high school, college/university) during at least part of the period after the traumatic event and until 2.5 years after. The study was approved by the Regional Committees for Medical and Health Research Ethics, South-East and North.

The nine interviewers, including the two authors, were trained by means of a qualitative interview guide to achieve a common approach and minimize personal differences during the interviews. Participants were interviewed in face-to-face qualitative interviews with an open-ended prompt: "Think back on your school situation after July 22, 2011. Please give examples of how your experiences from July 22 have affected your schooling." This prompt provided a direct association of school functioning as being affected by the massacre. The interview guide gave instructions for stimulating

free narratives concerning the broader school situation and for ensuring that aspects of learning and social environment were included. Interviewers were followed up by the two authors, who discussed experiences and made sure the interview guide had been followed. The interviews were conducted with a high degree of similarity among the nine interviewers. All interviews were audiotaped and transcribed verbatim. Responses lasted from two minutes to more than half an hour.

Academic achievement or *performance* is defined as to which extent students have achieved their educational goals, whereas *academic functioning* usually refers more to the cognitive process of learning.

Analysis

This explorative study examines various aspects of being a young person in a school context after having experienced a potentially traumatizing event. The analysis is phenomenological, searching for and describing how informants construct meaning of their self-observed changes in academic performance. Using an inductive approach, each author worked separately with the transcripts before discussing and conceptualizing phenomena that emerged in the empirical data. When uncertainty or disagreement occurred between the two authors, two additional researchers were consulted. Themes for analysis were derived from examining informants' self-observed changes in academic performance, and their explanations for such changes. The thematic analysis approach was employed when formulating analytic categories (Braun & Clarke, 2006). In analyzing informants' speech acts, we used theoretical perspectives on meaning-making, focusing on narrative, metaphor and attribution theory. In formulating aims and categories for further analysis, we drew on established knowledge on trauma-related cognitive impairment and academic functioning, and categorization and classification of traumatic stress and PTSD symptoms. Our initial identification of changes in academic performance and selection of four categories of change drew on a deductive approach based on trauma research.

The two authors have a background in educational psychology (including trauma research) and education. Both live in Norway and were indirectly affected by the terrorist attack, which has been recognized as a Norwegian national trauma. A process of continual and deep self-examination was initiated to enlighten our pre-understanding and our own role and influence during the analysis (Berger, 2015). Particular attention was paid to professional beliefs, theoretical orientations and emotional responses to participants' negative experiences.

Of the 65 informants in our study, 69% (n = 45) described distinctly negative changes in their academic performance in the 2.5 years following the massacre. Only 8% (n = 5) felt unsure as to whether any changes had occurred; a further 6% (n = 4) had experienced predominantly positive change, whereas 17% (n = 11) reported no change.

Our analysis focuses on the narratives of the 69% (n = 45) who reported distinctly negative changes in their academic functioning. The following themes emerged as two core categories: *"attribution to trauma,"* where the cause of change in academic function was assigned to the traumatic event; and *"attribution to other reasons,"* where the cause was assigned to other reasons beyond the trauma. Three sub-categories emerged when we explored characteristics of informants' recognition and meaning-making of changes observed: *"attribution"* of cause and effect, the use of *"metaphors,"* and characteristics of the *"changes"* observed. (See Figure 1.)

Results

In the following we present the two core categories on how students explained their changes in academic functioning as an attribution to trauma or to other reasons. We further describe their search for understanding and their concern and worries over their reduced academic functioning. Lastly, the use of metaphors are presented and how they support the meaning-making process.

Observed changes in academic performance

Among the 45 students who reported distinctly negative changes in their academic performance, 47% (n = 21) had made changes in their study plans, either by postponing or extending the timeframe for certain subjects. Only 22% (n = 10) had temporarily abandoned their studies and returned later – for instance, postponing school start by one semester, or taking a year off. Reasons given for the latter include long-term sleep-related problems and impaired daily functioning. The quote below is typical of those for whom severely reduced daily functioning made ordinary life and school attendance difficult:

> Well ... first of all, when I walked into the school there were just too many people. I didn't have control; there were people everywhere. There was simply too much going on in my head. And when I managed to get to the classroom, I couldn't follow the teaching. I was constantly thinking: "Who's sitting there?" and "Who's that person?" ... and suddenly I would hear noises. No matter what the teacher said – I couldn't grasp it. Just
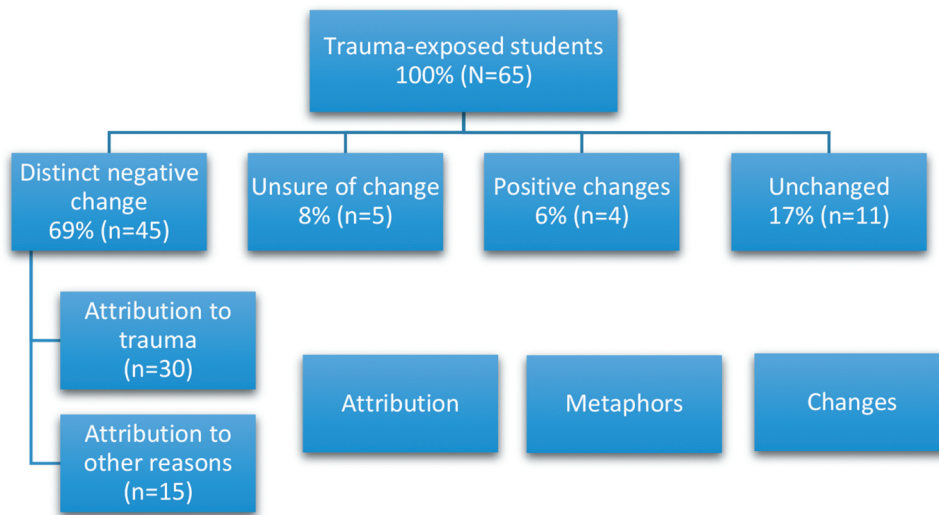
Figure 1. Analytic categories of students' self-observed change in academic performance and their attribution of cause and effect.

getting up in the morning, showering and getting ready was such a struggle. So I decided to study as an external candidate, so I could stay home and work on my own. (Female, high school)

Most respondents gave clear accounts of immediate and distinct negative changes in their academic performance, as shown in the quotes below.

No, I wasn't prepared at all; I understood on the first day that things were going to be different. After we were welcomed back in the schoolyard, we went up to the classroom … and I just felt I had to go, so I did. But I had to leave the first lesson. Then I realized: it might be hard, being at school. (…) Worst of all, I couldn't concentrate … when I was supposed to sit quiet and think. (Male, first-year high school)

Everything fell apart! It used to take me one minute to read a page, maybe half a minute. But now I had to read the page over and over again. I spent 20 to 30 minutes on a page – I'm not kidding. I just sat there staring at it, reading over and over, trying to make it stick. And in math … well, I simply couldn't concentrate (…) Everything went so slow. I used to have top grades, and then I ended up with Cs. My plans for university were blown … just like that. (Female, third-year high school)

The most frequently described changes in school performance were lack of concentration, and failure to remember what had just been read and extraction of information from written text. Another common problem was lack of perseverance in performing tasks that took more than a couple of minutes. Lessons dominated by oral lectures were difficult to follow. Students felt overwhelmed by too much information, experiencing feelings of chaos. Also mentioned were sleep problems, being restless and unmotivated.

Weak or indistinct changes in school performance were reported, especially by those with a previous history of poor grades, and those with preexisting learning disabilities. In the quote below the student describes how his learning problems got worse after the massacre.

I had concentration problems from before. I have ADD, which is ADHD without hyperactivity. So I've already struggled a bit with that, but … it is worse now. When the teacher or the topic wasn't interesting, I sort of faded out and did other things. Like sitting there and listening, without anything sinking in. (Male, first-year high school)

The majority of those reporting negative changes provided clear descriptions of the changes observed, with various changes occurring simultaneously. Some changes were observed early on; others became more pronounced as the semester progressed. Respondents who provided clear and detailed descriptions of change usually described themselves as being used to getting good grades; they appear to have an educational history of good or high academic performance. Some informants reported their school functioning as affected mainly by one dominant symptom, not a range of symptoms. A minority reported distinct changes appearing only three to six months after a fairly normal school start. Indistinct changes were especially common among students with a history of poor school performance.

That these changes were unexpected was a dominant theme in the interviews. The consequences were more severe and lasted much longer than expected, and made established study techniques less effective or even inadequate. Many respondents started to re-think their future plans, experiencing periods of great concern about being able to complete their studies, and their academic future.

That 69% (45 of 65 pupils) experienced periods of marked impairment of academic functioning after surviving a massacre should come as no surprise. What is striking is the frequent uncertainty as to the underlying reasons – with respondents often wondering whether the changes might have been caused by something else than the massacre.

Searching for reasons

Students were invited to tell a narrative concerning their school situation. Of the 69% (n = 45) informants who reported negative changes in their academic performance, 67% (n = 30) accepted this invitation and presented a narrative before and after the trauma, with the traumatic event as a clear turning point. Although 33% (n = 15) did not follow this narrative structure, they all reported distinct negative changes in academic performance, changes similar to those who reported a clear turning point. Naturally enough, a sudden, distinct change with negative consequences evokes worries and calls for explanation. The majority of those who reported poorer school performance ascribed the change directly to the traumatic event. Typically, our respondents would follow up the interview question by giving their narrative of how the massacre directly influenced their academic and/or social functioning. However, one third (n = 15) expressed considerable uncertainty whether, or to what extent, the observed changes in academic functioning could be ascribed to the traumatic event. The male student quoted below had just completed high school and was about to start university studies in mathematics and physics. He had always been a good student and enjoyed studying, but all that had changed.

> Yes … I have problems at school, but I don't know if it has much to do with July 22nd, I think there are other reasons. Because I didn't have any problems right away, but now I do. No, I don't believe that it has anything to do with July 22nd. Well, there was all the focus and attention, right afterward, and then the court proceedings that distracted me a bit. But otherwise I don't think it has influenced my schoolwork that much. (Male, first-year university studies)

This student described various changes, lack of concentration and motivation in particular. When asked why, he replied:

> I really don't know … I've been thinking quite a lot about it right now, that is what I try to figure out and try to get back on track. The last semester was terrible, I failed two exams and barely made it on the third. I failed in my favorite subject … because things simply went to hell, just like that. Then I lost all motivation, because I felt … I just can't make it anymore. The

reason for the last semester going to hell was maybe because it all felt so meaningless … things like that. But I don't think it had much to do with July 22nd.

At the time of the interview, his problems had developed into serious academic difficulties. He was not able to follow the regular study progression; he was in doubt about continuing with his chosen subjects and unsure whether he could even manage to study at all. He said he spent a lot of time trying to figure out the reason for the changes, and mentioned several possible reasons. His main explanation was that university-level study was new to him, with unexpected challenges. Moreover, recent radical changes in the set-up at his university had brought organizational challenges combined with new lecturers with little teaching experience. He went on to explain:

> I set pretty high standards for myself, so when I don't perform well I get very frustrated – I think that's the main reason … then I sort of just give up. I struggle with not being able to concentrate anymore, because in a way I feel there's no point in it all.

Steadily worsening grades had made him very frustrated, ready to give up. The lack of concentration was caused by the fact that he saw no point in studying – mathematics and physics had lost meaning, he explained. The only direct consequence of the massacre, in his view, was that following the lengthy court proceedings against the perpetrator made him lose several weeks of studying – but he added that being present in court was his own decision.

This student's sole explanation for the changes he had experienced assigned the cause to forces outside the traumatic event, such as the poor quality of teaching now offered by his university. He further provided internally attributed explanations: not being properly prepared, setting overly high standards, and his own shifts of priorities and focus in life.

The student quoted below had a school history of special needs education due to dyslexia and attention-deficit/hyperactivity disorder (ADHD). He explained that he had always experienced poor concentration and occasional periods of low energy. Since the massacre, all these symptoms had increased, but he himself felt unsure why.

> In the beginning of the fall semester that year [2011], I tried to avoid large crowds and new situations, but that gradually passed away. And then, since that first semester, there hasn't really been anything that … that I could link to it [the massacre]. But I've had lots of problems with low energy, poor concentration and memory – probably because of poor concentration, I don't remember anything. But if this has any connection to the experiences from July 22nd is impossible to say. (…) It's hard to say when you don't … when there's

nothing . . . no thoughts or intrusive things or anything like that . . . maybe it has something to do with it, maybe not. It's hard to say. (Male, third-year high school)

He explained his lack of concentration and problems in remembering by his low energy, with shifting energy levels directly affecting his academic performance. Although he held open the possibility that the massacre could have sapped his energy, mainly he felt that he had simply entered a low-energy period, as had happened before.

For the student quoted below, one clearly observed change was difficulty with keeping two thoughts in his head at the same time, as he put it. For instance, he felt overwhelmed if he had two tests coming up. He was unsure of the reason behind these changes, but mentioned absence from classes as a direct cause of his poor grades.

> I was absent quite a lot. I guess I was tired sometimes, and I don't know if this was because of Utøya, but I felt tired a lot of the time. . . . With some subjects like French and math, I didn't manage to attend class, so I fell way behind in math. My French grades were affected, too, since I couldn't manage to sit down and concentrate on the homework. (Male, high school)

The quote below provides another typical example of respondents finding internally attributed explanations for their worsening grades – they blame themselves for the change.

> Well, in a way I knew: "Well, no wonder you didn't pass, you should have read the book before you sat down for the test." It was obviously my fault. (Male, first-year high school)

In this section, we have presented quotes from informants who assigned the cause of the recent changes in their academic functioning to forces beyond the traumatic event itself. They did not necessarily deny a connection, but they focused on other causes – a mixture of externally and internally attributed explanations, especially the latter. In searching for explanations, they saw their own actions as having a direct cause–effect relation with their poor academic performance. Explanations were often constructed on the basis of practical and familiar causes – becoming tautological, as each component could potentially explain the other: *I failed the exam because I didn't study the book – because I couldn't concentrate – because I couldn't sleep – because I've developed bad sleep habits.*

Concern, worries and the use of metaphors

When students reported concerns about reduced academic performance, this was linked to not being able to understand the nature of the changes, and to uncertainty as to what to expect in terms of intensity, duration and help with these problems. The student in the quote below managed to maintain her grades by making great efforts. She is representative of the category of students who expressed concerns and rumination: they were worried about their worsening academic performance, but reported little or no help from teachers.

> I got through the year, but it came at a high cost. Studying was tough, and I had real problems with concentration and motivation. I kept thinking: "Why am I doing this?" And then I became more and more afraid, like: "Oh my God, I've always been so motivated for school and it's always been easy for me to learn new stuff" . . . but now everything just stopped. I wanted to do something else, just look out the window, just . . . just get away and do something else. (Female, first year, university)

At the time of the interview one student had no longer managed to follow the regular course of study. She had found it impossible to compensate for not being able to concentrate. Unsure whether she would manage to complete her bachelor's degree, she described her situation as "hopeless" and "extremely frustrating":

> It is . . . extremely frustrating, because I feel, I sort of feel that I've got brain damage, do you understand what I mean? Like: "Oh shit! Have my brain cells disappeared or something?" In a way I know that's not what happened, but . . . it's all so frustrating! (Female, third year, university)

The student quoted below had been following the normal course of study. Then, after the experience of July 22, 2011, he had fallen two semesters behind. His parents and his GP had "forced" him to apply for a reduction in his study loan, on grounds of "illness due to the traumatic event." However, he rejected the idea that experiences from the traumatic event had changed him and made him "stupid":

> I shouldn't have become more stupid . . . because of this [the massacre]. My brain should still be working. And it does, the logical part is still functioning. And my memory – yeah, everything still works. (Male, fourth year, university)

Now he has put off doing his academic work, instead spending time on non-study related projects, mostly alone. While acknowledging this considerable change in study behavior, all he can say was: "I don't know why it turned out like this, I honestly don't know."

The 45 respondents who observed distinctly negative changes frequently employed metaphors in trying to understand and explain what had been happening to them. This use of metaphors often came in a context where the student expressed worries and concern about

a lasting reduction in learning capacity, and did not know how to understand these changes.

We found two core types of metaphors, which we label *open* and *closed* metaphors. A metaphor becomes "closed" if it carries an explanation in itself, whereas an "open" metaphor is explorative and functions as a building block in the ongoing meaning-making process. In a typical closed metaphor, the study situation and grades were described as "going to hell" and "down the drain." This often appeared in a rather short narrative followed by internally attributed explanations that involved the respondent as a part of the cause–effect relation. There was no immediate need for further information: the explanation appeared sufficiently meaningful, and the meaning-making process ground to a halt.

Another example of a metaphor that restricted the meaning-making process was "getting back to normal," with its assumption that the situation would quickly return to "normal." On finding that there was no such thing as getting back to a "normal" school day, many respondents expressed surprise, and frequently concern and even fear. These pupils will need to reconsider their understanding and re-open their meaning-making process in order to understand their current situation.

Other examples: *I've turned into a "vegetable" because I don't sleep* or: *I was simply "out of myself."* These are metaphors that hold meaning. Such metaphors can be sufficient in themselves, or can at least create meaning for a while. By their nature they also bring closure to the meaning-making process, due to references to established facts in folk-theory and ways of speaking. Or, some respondents described their lack of verbal memory: *it went in one ear and out the other.* When not followed by further questioning, the metaphor becomes a self-sufficient bearer of meaning. By describing an unfamiliar situation with a familiar phrase, the metaphor turns it into a familiar situation, adding something known to the unknown.

By contrast, we noted very few instances of *opening* metaphors appearing in the narrative in an exploratory context. In one case, a high school student described his reduced academic functioning as being caused by a "dark cloud" that appeared in his brain, blocking out the regular functioning. This improved later, when his life and his brain finally regained "HD quality." The High Definition quality is a technical term for describing electronic picture definition, which he used to describe his lack of concentration and impaired executive functioning. This metaphor itself is "open" in the sense that HD quality can be improved if one has the right know-how and skills for fine-tuning the degree of definition.

Another example of open metaphors is the "collapsed bookshelf." Some respondents used this metaphor to explain a reduction in auditive memory, in short-term memory, in being able to accumulate new learning, and problems with retrieving stored knowledge. The metaphor also describes a lack of function: a broken bookshelf is no longer capable of holding books – but it can also be strengthened and repaired.

> The first half year was … it was really strange: first I was very apathetic, then I gradually took in more and more of what had actually happened, and then things went downhill, down and down. I kind of hit bottom around New Years, then it all started to go upwards again: I began to get hold of things, slowly. (…) So, in a way I kept on going upwards.

> That was in a way rock bottom. Slowly but surely the bookshelf started to give way and the books started to lean over and then, suddenly all the bookshelves collapsed – that was in those days where everything was in chaos. That's how it felt, everything felt wrong and threatening and … strange. So in a way I had to rebuild the library. Doing this is one of the things I'm most satisfied with, how I handled this and managed to rebuild myself from ground zero. In a way I've gained a lot of self-confidence and belief in myself … willpower and stuff like that … because I managed to fix it, in a way … in many ways. (Male, third-year high school)

Here the respondent used directional metaphors to describe the direction of the change in his daily functioning. This was described as a gradual process, first "down," hitting a "rock bottom" and then moving "up" again. He used the "collapse of the bookshelf" as a metaphor to explain aspects of how he observed and experienced the change. Before the traumatic event he had a good "library" (a working brain) full of "bookshelves" where everything he had learned was neatly arranged in proper order. He knew where to find everything. Then some shelves started leaning, books fell out, and some days he could wake up to find all the books in a huge heap, where it was impossible to locate anything in the chaos. With his teacher and his psychologist, he discussed ways of re-building the library by reconstructing the bookshelf, testing out alternative learning strategies and study skills. Together they found ways to adapt his school studies, so that he could maneuver in the chaos and could support, strengthen, and re-build those bookshelves.

This narrative carried an external attribution in describing the traumatic event as the direct cause of the change in his academic performance. His further systematic use of several open metaphors provided building-blocks of reasonable, manageable explanations. This meaning-making process enabled him to put himself in an active role where he could set about finding new and alternative learning strategies and study skills to compensate for his reduced learning capacity.

Discussion

Triggering the narrative process

A part of daily cognition is conceptualized as the process of storage and retrieval of action scripts, organized in narrative structures. It has been theorized that such scripts constitute schemas that incorporate generalized knowledge about event sequences, relations between events and causal understanding (see Schank & Abelson, 1977). Our respondents all have had many years of experience as school students, acquainting themselves with study techniques and their own learning processes. As part of their daily life experiences, studying and learning have become scripts and cognitive schemas that provide a framework for sequences of familiar situations. The script serves as a means for understanding events that conform to the expected – but then, when the unexpected occurs, the meaning becomes unclear. The narrative process is triggered by the unexpected; it reviews the unusual event, seeking to make sense of it. Creating narratives is a cognitive process that serves understanding by organizing and connecting events and happenings into frames of meaning (Bruner, 1990: Polkinghorne, 2005). The narrative is an instrument for meaning-making because we deal with the world, not event by event, but by framing events within larger structures (Bruner, 1990). Narrative reports tend to connect events in a structured way, with a beginning, middle, and an end – all motivated by *plots*:

> Narrative structuring operates by configuring actions and events into a temporal whole. As concepts serve to give meaning to particular objects and actions by giving them a categorical identity, plots serve to give meaning to particular happenings and actions by identifying them as contributors to the outcome of an episode.. (Polkinghorne, 2005, p. 6)

Of our 65 respondents, 69% (n = 45) reported changes in their academic performance that were so negative that they initiated a narrative process for exploring and understanding these changes. Explaining the cause of the change is the *plot* or the *motivation* for the narration. Of these 45, 66% (n = 30) provided narratives attributing the changes directly to the traumatic event as the turning-point, whereas 33% (n = 15) presented narratives assigning the dominant cause elsewhere – or were unclear, leaving their narratives with no specific turning-point.

Of course, there may be other factors causing reduced academic functioning for those 15 respondents. However, all our respondents had been exposed to traumatic events on Utøya, and 45 report self-observed, distinctly negative changes in their academic functioning. The way they describe these changes is in line with symptoms described in the diagnostic manual for traumatic stress reactions and post-traumatic stress disorder as being common and expected in the aftermath of traumatic events (APA, 2013). In addition, the Utøya study has found high clinical levels (24.5%) of anxiety and depression symptoms in the total population of Utøya survivors, 2.5 years post-trauma (Stene et al., 2016). There are co-morbidity and over-lapping symptoms between PTSD, post-traumatic stress, anxiety and depression (APA, 2013). How, then, can it be that 33% (n = 15) of 45 informants ignore the traumatic event in searching for explanations? Let us turn to their use of metaphors and characteristics of attribution in the meaning-making process.

Use of metaphors in the narrative process

Not surprisingly, metaphors are frequently used as building blocks in constructing a narrative to explain change. There is a categorical difference in the use of closed (cognitive) and open (innovative) metaphors. The metaphors used by those 30 respondents who employed trauma-attributions are dominantly *open* metaphors not intended to carry the full explanation. Whereas the open metaphor "collapse of the bookshelf" indicated temporary loss of function, the closed metaphor "brain damage" referred to functions as permanently damaged. Metaphors become open and explorative when their purpose is to add manageable bits of explanation. By contrast, closed metaphors provide a more comprehensive explanation: the student turned into a "vegetable;" everything "went down the drain". The closed metaphor "It all went to hell" provides a highly concrete image, explaining the result of wrong, morally bad behavior: I didn't read the book, I didn't do my job – so I got the punishment I deserved. Closed metaphors were employed mainly by the 15 (33%) respondents who used non-trauma-attributions, frequently combined with internally attributed explanations of observed changes. Using dispositional factors involved the respondents themselves in the cause–effect relation, making themselves responsible for the change.

Metaphors can provide understanding of aspects of the (concept of) changed academic performance, providing manageable explanations. The metaphors become open and explorative when their purpose is to add information to an ongoing meaning-making process, providing pieces of information needed to stimulate the construction of a framework for understanding the concept. By contrast, as closed metaphors appear to carry sufficient meaning in themselves for explaining the plot, the reason and cause for change, they halt the

meaning-making process. To what extent a metaphor provides closure or further stimulates meaning-making will depend on the context. In this study, the metaphors that served to halt the meaning-making process involved rather limited descriptions in brief narratives with predominantly internal attributions as to the cause of change.

Looking beyond trauma

We can note several differences between the narratives of respondents who attributed the change directly to the trauma and those who did not. Attributions of self-observed changes are generally influenced by when and how the changes are recognized. Respondents who assigned the cause to the trauma often described changes that were "quick and many" – not "late and few." Changes that emerge in close proximity to the traumatic event and do not appear in isolation are more readily recognized as linked to the traumatic event. Conversely, changes are less easily linked to trauma if they emerge as single, isolated changes relatively far removed in time from the event, and if they fluctuate. Those of our respondents who had a previous history of learning disabilities seemed to experience less marked changes, and were less likely to look for other explanations if the change was within domains of learning where they had already experienced challenges or low capacity.

In Western society today we can note widespread assumptions as to what "reasonable" reactions to trauma should be: immediately after the event there should be strong initial reactions, which subside gradually. Further, reactions should be readily recognized as a direct result of the trauma, as with sounds resembling shooting or screams, intrusive memories or images directly linked to the traumatic event. This "folk psychology" (Bruner, 1990) entails a set of descriptions or common understandings of what is to be expected in a certain situation. Any divergence from the expected reactions seems to open the way to attributional errors.

The narratives of all 45 respondents who reported changes in academic performance contained strikingly few references to diagnostic descriptions. In assigning cause, our respondents placed the negative changes in a context of ordinary language with general everyday descriptions: such references seemed to provide sufficient meaning.

The 30 (66%) respondents who used trauma-attributions provided clear external attributions that assigned the cause of change to trauma-linked situational factors: the event itself and the aftermath. Having completed their cause/effect narrative, they are in the first phase of their narrative structuring. Their trauma-attributions are unstable, as the observed changes are viewed as temporary. Western folk psychology expects the changes to subside gradually, and then disappear. This type of understanding triggers the second phase of the narration, where the plot is *recovery*. Meaning-making is now motivated by observing and describing ongoing changes, aimed at regaining lost learning capacity. A sense of control is obtained and self-efficacy is built by turning to alternative study techniques. Community efficacy (Bandura, 1997) can be built by consulting persons like teachers and psychologists. The total narrative has a clear structure: the traumatic event is identified as the cause of change, to be followed by recovery. The narrative can be closed once recovery is achieved, ending the meaning-making process.

However, the narratives of the 15 (33%) respondents with non-trauma-attributions involved no clear turning-point. Several hypotheses were often presented as a combined set of possible causes, with examples of situational (external: e.g., change of school) and dispositional (internal: e.g., laziness) attributions. Here, trauma-attributions appeared less stable than non-trauma-ones, but also the latter tended to be unstable – respondents saw themselves as currently undergoing a "phase;" they expected to resume old habits and regain academic capacity later on. However, as the changes had persisted for 2.5 years at the time of the interviews, the various hypotheses of unstable attributions must be questioned, making attribution to situational factors become less reasonable. Respondents now tended to admit that theirs may be a more stable condition attributable to dispositional factors.

In several instances, the narrative process of non-trauma attribution was headed toward a stable dispositional attribution. The changes were now seen as becoming permanent: "I simply don't function anymore" and "I lost interest – and it's stayed that way." Some students with trauma-attributions now found stable attributions more and more credible, for instance, wondering if they have permanent "brain damage." They have begun actively questioning the stability of their attribution, discussing and arguing with themselves: "It's not logical for one and a half hours on an island to define me for the rest of my life." Ehlers and Clark (2000) describe this type of negative appraisal as a dysfunctional strategy that can maintain PTSD by producing negative emotions and lead to negative coping strategies. When individuals fail to acknowledge symptoms as a normal part of the recovery process, this can produce a sense of ongoing threat to their physical or mental well-being, with the symptoms seen as being a permanent change (Ehlers & Clark, 2000).

Some one-third of our informants appear to have made attributional errors of cause and effect. Among the well-documented attribution biases is the *self-serving bias*, evident in the tendency to take credit for personal success but to deny responsibility for personal failure (see Zuckerman, 1979) – a psychological strategy used to enhance and protect self-esteem. The self-serving bias has been observed in various settings, influenced by the degree to which individuals feel that their self-concepts are threatened. Factors that influence the perception of self-threat include the importance of the task in question, the difficulty of the task, expectations of success or failure, and the competitiveness of the individual (Campbell & Sedikides, 1999; Coleman, 2011). Following the logic of this psychological protection strategy, the obvious option would be to use external attributions for impaired academic functioning – placing the blame on the traumatic event. Thus, we will argue that non-trauma attributions in our material may be interpreted as a protection strategy, and thereby a type of self-serving bias. The Utøya massacre became a national trauma with enormous mass-media coverage. A study of identity-work among survivors, with the same respondents as the present study, has shown how these young people systematically seek to avoid the stigma of becoming a "victim" (Skarstein & Schultz, 2017). They deny or resist the changes in their social identity and student identity (from high academic performance to low) by disassociating themselves from Utøya and trying to seem as "normal" as possible. They appear restricted in their ability to negotiate their identity. In trying to take charge of their own identity work, they focus on controlling the attention drawn to their Utøya identities, thereby denying or hiding aspects of their traumatic experiences and symptoms of traumatic stress (Skarstein & Schultz, 2017). Ignoring or downplaying the traumatic event as the cause of change can help to avoid stigmatization – you are in charge of your own identity-work, attributing the change to dispositional factors that you can control yourself.

The advantage of perceived control over outcome has been repeatedly demonstrated in classical social psychological experiments (see e.g., Glass & Singer, 1972). A similar function is found in a certain type of self-blame being a positive psychological mechanism in the aftermath of trauma. Behavioral self-blame is control-related; it involves attributions to a modifiable source (one's behavior), and is associated with the belief that negative outcomes can be avoided in the future. By contrast, characterological self-blame is related to self-esteem; it involves attributions to a relatively non-modifiable source (one's own character), and is associated with feeling that past negative outcomes have been deserved (Janoff-Bulman, 1979). Similarly, the tendency of our informants to use non-trauma attributions can be viewed as a desire to maintain a sense of control – and might be a short-term positive psychological mechanism for recovery. More problematic is when those with non-trauma attributions develop chronic stress-related symptoms. They lack the advantage of achieving the second phase of recovery-narratives, because there is insufficient information to trigger that second phase.

A classic challenge after exposure to trauma is viewing the psychological trauma as an external event of the past, or as an ongoing internal process with perhaps lasting internal changes. When the outer and inner worlds have changed dramatically, the balance needs to be restored. The individual must re-build the inner world by reestablishing positive fundamental assumptions of the world – and all this in a state of anxiety, fear and loss (Janoff-Bulman, 1992). In this turmoil, the search for a causal attribution is influenced by social surroundings, opinions, and available information. Our study found only a few instances where informants reported support from teachers who could provide useful information and engage in dialogue. The majority seem to have been left on their own, trying to make sense of complicated and unfamiliar concepts like PTSD-related, temporary and distinct cognitive impairment.

Finally, gender emerges as a factor regarding attributional style. Among the 46 students who reported reduced academic functioning there were slightly more females than males, whereas only two of the 15 students who employed non-trauma attributions were female. If non-trauma attribution is viewed as a psychological mechanism for remaining in control and avoiding the victim-label, it is noteworthy that this mechanism was employed predominantly by male adolescents. This finding is in line with studies that show males to be generally more likely to engage in externalizing rather than internalizing behaviors after trauma (Hankin et al., 1998; Tolin & Foa, 2006).

Strengths and limitations of this study

The study design provides unique qualitative data on how 65 Norwegian young people experience and explain their academic performance and functioning after exposure to traumatic stress. The large sample offers a broad picture, with in-depth examples that highlight prominent tendencies and patterns evident across different schools and genders. However, this study also has some limitations. The interview prompt invited the informants to make a direct association between academic functioning and the traumatic Utøya event. Even

so, 16 informants denied such an association or did not find it relevant, and another 15 were highly uncertain whether such changes could be ascribed to the traumatic event. Secondly, we cannot guarantee that all self-observed changes of academic functioning have been caused by PTSD-imposed cognitive impairment. Furthermore, the interviews were conducted at the beginning of a 60- to 90-minute standardized questionnaire; in some cases, this might have meant a somewhat hurried situation with insufficient time for follow-up questions and elaboration. Moreover, due to purposive sampling within the main sample of the Utøya study (Dyb et al., 2014), these 65 informants might not be a representative sample.

Conclusions

This study has explored how PTSD-imposed temporary cognitive impairment influencing academic performance and functioning is recognized and explained by young people who were exposed to a traumatic event, the 2011 Utøya massacre in Norway. Using a phenomenological approach to survivors' narratives, we have identified several prominent aspects of the meaning-making process of self-observed change in academic functioning.

Among our 65 respondents, self-observed changes in academic functioning in the aftermath of the traumatic event were significant to the extent that a meaning-making process was triggered in 75% (n = 49) of them. Further, 69% (n = 45) reported negative changes characterized by a sense of chaos, impaired concentration and auditive memory, and by experiencing previously used study techniques as less effective or inadequate. Our respondents said they had not been prepared for these changes: the consequences were more severe and lasted longer than expected.

From characteristics of the observed symptoms, the use of metaphors, attribution style and narrative structuring, differences emerge in respondents' meaning-making processes. Of the 45 respondents who reported negative changes, 67% (n = 30) offered clear trauma-attributions as to cause; the attribution was often unstable, with changes seen as temporary. Their narratives tended to be descriptive and complex. Stories revolved around a clear turning-point (the massacre), describing school-life after the trauma as opposed to pre-trauma by highlighting the changes. The use of metaphors was generally open and explorative. Narrative structuring extended into a second phase, of recovery, where the turning-point was a reduction in the intensity or number of changes/symptoms.

Non-trauma-attributions (33%, n = 15) were predominantly external (e.g., change of school), with some internal (e.g., "I've changed because I shifted my focus and priorities"). Narratives with internal non-trauma-attributions have no clear turning-point; indeed, the narrative process is characterized by an ongoing search for a turning-point. Non-trauma attributions are characterized by symptoms like late onset, single reaction, not intuitively connected to the event and not among the expected patterns set by folk psychology. Preexisting learning challenges or disabilities cause uncertainty when trauma-induced changes occur within already affected cognitive domains. Metaphors tend to be closed, without stimulating further meaning-making, leaving the individual with an explanation partly understood in metaphorical terms but lacking the precision and information necessary for a sound conclusion. Further, non-trauma-attributions in our study did not appear to trigger the second phase of meaning-making of constructing "recovery narratives."

If post-traumatic stress symptoms subside fairly quickly or do not cause significant long-term problems, the clinical correctness of the meaning-making might not be of importance. Examples of unstable non-trauma attributions, which we describe as attributional errors, can function as a psychological mechanism that fosters recovery by allowing the student to maintain a sense of control: "I didn't prepare for the exam *[so it's my own fault that I failed]*" and avoid the stigma of being a victim: "Oh, I can manage."

When symptoms persist for 2.5 years and significantly affect academic performance, the type and quality of meaning-making appear significant. A more clinically correct attribution becomes important for reducing rumination, correcting negative appraisals, stimulating help-seeking activity, the willingness to accept adapted education and recovery. Previous meaning-making is up for revision – in particular, all forms of unstable attributions are challenged when academic functioning has not been regained as expected. This is a vulnerable phase in the meaning-making process, where more information is needed to maintain the unstable attribution and trigger or maintain the recovery narrative.

The following appear to be the most constructive qualities of meaning-making with lasting symptoms found among our respondents: an unstable trauma attribution with use of open metaphors where the second phase of a recovery-centered narrative has been triggered. These recovery narratives entail an active search for reduced symptoms, and experimenting with alternative study techniques to compensate for lost learning capacity or to restore impaired academic functioning. They are characterized by sense of control, self-efficacy, and community efficacy.

Many of our respondents ruminate and worry about their impaired academic functioning, but report little or no discussions with teachers. They appear to have been left largely on their own in their meaning-making processes, struggling to make sense of the complicated concept of PTSD-related cognitive impairment.

Implications for practice and further research

Given the long-term disruption and impairment of academic performance, we hold that greater educational follow-up on the part of the teacher may offer a good point of intervention with these traumatized students. Improving the students' own understanding of their academic functioning may lead to positive effects on their academic work. Further, we would recommend that educational psychologists provide counseling for teachers, so that they can give psycho-education and help students in exploring their functional study skills to improve their self-efficacy – to recover their academic functioning.

A review of intervention research on the treatment of those exposed to disasters and mass violence (Hobfoll et al., 2007) identified empirically supported principles that are widely used to inform intervention and prevention efforts, in the immediate aftermath of a critical event and up to three months thereafter. Examples of practical and evidence-informed guidelines with modular approaches are Psychological First Aid (PFA) (Brymer et al., 2006) with a version adapted for schools (Brymer et al., 2012) and Skills for Psychological Recovery (SPR) (Berkowitz et al., 2010). In recent decades, the concept of *trauma-informed approaches* has spread, attracting interest among practitioners and scholars in various fields including education (Champine et al., 2019). Trauma-informed schools (see, e.g., Luthar & Mendes, 2020; Overstreet & Chafoulea, 2016) are often anchored in theoretical frameworks such as Guidance for Trauma-informed Approach (SAMHSA: Substance Abuse and Mental Health Services Administration, 2014). However, despite the growing support and increased implementation of trauma-informed approaches in schools, evidence to support this approach is lacking (Maynard et al., 2019). This is partly explained by the lack of rigorous evaluations, and by unclarity as to actual practice in schools that claim to use trauma-informed approaches. Several studies have noted teachers' uncertainty about their own role and how to go about supporting and teaching traumatized students (e.g., Alisic, 2012; Alisic et al., 2012; Røkholt et al., 2016).

In view of the limited literature on teachers' support of traumatized students, more research is needed on the use of specially adapted measures to stimulate and recover academic functioning. Students with lasting impaired academic functioning are a vulnerable group, and would benefit from investigations that can identify the most efficacious educational support to help their academic recovery from post-traumatic stress. More qualitative research on what teachers do and how students experience their situation and the educational support offered would be a valuable supplement to the empirical literature.

Disclosure statement

The authors declare no conflict of interest.

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