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On epistemological violence in mathematics education research –
An exemplary study in the Journal of Mathematics Teacher Education

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ABSTRACT: The contribution introduces the concept of epistemological violence from critical psychology into the discourse of mathematics education research. The concept is specific to violence produced through 'knowledge'. It addresses the negative impact of research on the Other – the group being studied as distinct from the ones studying. It holds the possibility to link research ethics and the idea of scientific correctness to each other, by focussing on the relationship between theoretical propositions about the Other and practices of data interpretation in empirical research products. An exemplary study in the *Journal of Mathematics Teacher Education* illuminates how easily epistemological violence is (re-)produced in the dissemination of research results when it goes unreflected. Finally, the scope and limits of this concept in mathematics education research are discussed.

Keywords: Epistemological Violence, Research Ethics, Mathematics Education Research

I. Introduction

In everyday language, the term 'violence' is mostly used to describe physical aggression against a person or a group of people. The label 'emotional or psychological violence' describes other types of behaviour, which do not directly harm the physical body, yet deserve the name 'violence' for having a negative impact on a person's quality of life. It denotes acts that violate the human dignity of others. Within the public discourse, acts of

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either physical or emotional/psychological violence are often thought to be intentional (see for example WHO 2017).

Using the term 'violence' holds strong moral underpinnings. Assigning a notion of being violent to a certain practice challenges it and carries a strong impetus for change. This moral impetus is used in academic publications, too, and so do I when using the term 'violence' in this publication to refer to particular practices within mathematics education research.

In the following, I will first elaborate on the distinction between *subjective* and *objective violence* and different conceptions of violence in mathematics education research. I will then introduce the concept of *epistemological violence*, which is specific to violence through academic practices. This concept provides an analytical framework for unravelling how research methodology plays a role in the (re-)production of violence. It furthermore has the potential to link concerns about research ethics to the idea of scientific correctness. To illustrate this, I am going to employ the analytical framework of epistemological violence to examine publications about (future) mathematics teachers and their learning and development.

II. Subjective violence versus Objective violence

The discussion about violence and the role research plays in its (re-)production depends on how violence is conceptualised and what counts as violence. In his discussion on violence, Slavoj Žižek (2008) categorised several different meanings of what could count as violent acts according to the distinction between *subjective* and *objective violence*. He characterises *subjective violence* as an immediate direct experience of aggressive acts against an individual or a group of people that is "performed by a clearly identifiable agent" (p. 1). Objective forms of violence are hidden behind directly visible forms of subjective violence. To him, the hidden objective violence generates outbursts of subjective violence. The strong focus on subjective forms of violence within the public discourse distracts from acknowledging objective forms of violence that we ignore or even unconsciously participate in. Within the public discourse, these often do not count as violent acts.

Objective violence is divided into *symbolic violence* and *systemic violence*. With the term symbolic violence, Slavoj Žižek refers to the concept of Pierre Bourdieu (1977, 1990). *Symbolic violence* describes a form of violence that works through the imposition of universal meanings: Systems of categorisation, constructed for example in the educational process, appear as the natural way of how things are. Therefore, they are neither questioned nor even recognised as shaping our actions. Taken-for-granted categories mask the power relations behind these constructions, making persons accept a practice as legitimate, which might even work against their interests. The categorisation of students according to their performance on tests is one example of symbolic violence in educational settings: If students perform poorly on a test, they are labelled to be 'less able' or 'poor learners' of a particular subject and blamed for it. These labels are accepted by students, parents and teachers instead of being questioned in terms of their construction and legitimacy.

Systemic violence describes a form of violence that is inherent in a specific system that becomes the 'agent' of violence (Žižek 2008). According to Slavoj Žižek, it is a consequence of the smooth functioning of our economic and political system. He argues that in our current societal system new forms of domination have been established that are legitimised by scientific discourse (Žižek, 2004, p. 388). He explains the functioning of these new forms of domination with the discourse formation of the 'university discourse' – a discourse formation initially described by Jacques Lacan. Within the discourse formation of the university discourse, the agent is not an individual or a group of people, but knowledge itself becomes the agent (Parker 2005, Žižek 2004). Ian Parker focuses on the role of the university discourse in the academic realm. He outlines that the specific discourse formation of the university discourse enables the researcher to define phenomena within a certain methodological paradigm that guides the research process. At the same time, researchers make use of the discourse and are subjected to this discourse formation (Parker 2005). In addition, Slavoj Žižek brings into focus the role of the university discourse within the current political system:

> The 'truth' of the university discourse is power: the constitutive lie of the university discourse is that it disavows it performative dimension presenting what effectively amounts

to a political decision based on power as a simple insight into the factual states of things (Žižek 2004, p. 383).

Within the concept of systemic violence, knowledge is considered, in an abstract sense, as an agent. Thus, violence can be performed through knowledge, and since research plays a crucial role in producing knowledge, it plays its part in the production of violence.

Conceptualisations of violence in mathematics education research

We can find a number of different attempts within mathematics education research that shift the focus from subjective to objective violence. The conceptions of violence differ and so does the perception of the role that research plays within the (re-)production of violence.

Ubiratàn D'Ambrósio (2009, 2015) perceives education to be playing an important role in overcoming present forms of violence and voices the call for a change in educational practices:

> [v]iolence comes from fear, fear comes from incomprehension, incomprehension comes from ignorance […] we eliminate ignorance with education (Leah Wells, cited in D'Ambrósio 2009, p. 242).

He explicitly expresses the potential negative impact of contemporary mathematics education and calls for peaceful practices that lead to a non-killing mathematics education, a mathematics education respecting human dignity instead of violating it. He extends the notion of violence further to include violence against nature. By arguing that education has been favouring violence towards nature and varying groups of human beings, the responsibility lies within the realm of education - including mathematics education research - to end practices that support violence and its reproduction. Ending those practices would include taking responsibility for society's (mis-)use of the intellectual output of the research community. Ubiratàn D'Ambrósio thus conceives research as an entangled confederate in violent practices, if it is not actively working against the reproduction of violence.

Specific variants of symbolic violence have been identified in mathematics education. Robyn Jorgensen, Peter Gates, and Vanessa Roper (2014) describe the symbolic violence of ability grouping, which limits working class students from access to mathematics. They characterise this practice as being only one of many that marginalised groups willingly participate in, despite the fact that these very groups fall victim to said practices. Kathleen Nolan (2012) focuses on symbolic violence and the role of teacher educators (which are often researchers, too). She sees a potential in breaking through the reproduction cycle of symbolic violence by making the core values and discourses visible that are misrecognized to be natural or inherently necessary and thus opening them up for questioning. Within this strand, research is seen to be useful in uncovering practices of symbolic violence and challenging misrecognition that create conditions for the exercise of symbolic violence in educational institutions, thus serving in overcoming violence.

Researchers identifying themselves with a critical stance towards current approaches to mathematics education (research) start to question the knowledge production in mathematics education research and its role in capitalism. In the introduction of the book "The Disorder of Mathematics Education", the editors argue that fixed methodologies which provide a 'plan' on how to do research might be aligned with the "operating modes of global capitalism" (Straehler-Pohl, Bohlmann, & Pais 2017, p. 4). They point out that research conducted under a sociopolitical banner, too, faces the danger of (blindly) following fixed theories and methodologies that tend to reproduce the cycle of symbolic violence. Alexandre Pais (2017) argues for the need of a different perspective in mathematics education research, because the negative sides of mathematics education – students' systematic failure, increased testing, etc. – are "violent expression of the disavowed part of itself" (p. 70). Hence, for Alexandre Pais, mathematics education is not 'only' responsible for not intervening in the reproduction of different forms of violence, rather he points to mathematics education being an agent that produces violence itself. Instead of researchers trying to fix practice, he suggests, research practices themselves are in need of being fixed. What is different within this emerging strand of mathematics education is the exclusive focus on research practices, rather than educational practices happening e.g. in schools or university seminars. Alexandre Pais and Paola Valero (2012) call this type of research "researching research".

Research here does not serve the aim to overcome violence in the educational practices which research is done upon. Instead, the negative impact that research itself has on educational practices is made the subject of the discussion.

Locating myself in this emerging strand of research, I will introduce the concept of *epistemological violence* in the next section in order to specifically focus on precisely those forms of violence that are (re-)produced in academic discourses. Epistemological violence is specific to empirical research and the communication of research outcomes in publications. The focus lies on ethical and methodological considerations of academic research practices.

As I perceive it to be a form of objective violence, identifying epistemological violence in a publication does not and can not imply any judgement of the authors' intentionality. Undoubtedly, research products are produced under specific conditions (e.g. scientific monitoring of intervention projects), and many different factors influence the production (e.g. a particular style of reporting findings accepted by the research community). It is my position that individuals are simultaneously able to shape and are shaped by discourses and structures they live in. Therefore, researchers – including myself – are shaped by academic and public discourses, and structures in which they work, but at the same time, they shape those discourses and research practices.

III. Epistemological Violence

> The term epistemological violence is introduced in order to identify interpretations [of data] that construct the 'Other' as problematic or inferior, with implicit or explicit negative consequences for the 'Other' even when empirical results allow for meaningful, equally compelling, alternative interpretations (Teo 2008, p. 47).

Thomas Teo (2008) argues that interpretations of empirical data that have implicit or explicit negative consequences for the *Other*, should be perceived as a violent act. He refers to Gayatri Chakravorty Spivak's (1988) work on *epistemic violence*, describing a form of violence by the academic constitution of the subaltern subject as the *Other*, that leads to the *Other's* voice not being represented in the discourse. Transferring this idea to the methodological component of research practices, the crucial point in the concept of

epistemological violence is *how* the *Other* is constructed and presented in research products. The term the *Other* stands here for any (sub-)group of people studied by researchers and constituted in the communication of research. Within mathematics education research, groups of relevance could be mathematics learners (e.g. learners from a marginalised group, learners attending a particular school type), mathematics teachers (e.g. school teachers, kindergarten teachers), teacher educators, parents, et cetera.

Thomas Teo (2010) argues that when human beings are studied, researchers hold an ethical and epistemological responsibility. Adding the audience (other researchers and practitioners) of research products complicates this issue. Based on her observation that her own research outcomes are interpreted differently than intended in the communication of findings, Candia Morgan (2017) reasons that research outcomes are always viewed relative to the practice within which they are functioning. She shows that an empirical result can lead to different interpretations and exemplifies this case by looking at data from one of her research projects and elaborating on how these findings could be understood differently within different branches of research. She also points out how value-laden interpretations played a significant role in this and how one could come to different implications depending on the research strand and personal convictions. She argues that even though researchers may not have full control over how research results may be incorporated into different discourses to support another reading according to pre-existing positions and values, the question of the mode of communicating research outcomes still should be relevant for researchers. With the concept of epistemological violence, Thomas Teo focuses on just a partial aspect of this mode of communication: giving interpretations of empirical data.

Thomas Teo (2010, 2011a) emphasises that interpretations of inferiority or problematizations are never determined by empirical results. Therefore, empirical results always "allow for meaningful, equally compelling, alternative interpretations". With this second part of the definition of epistemological violence, he seeks to establish the link between ethical considerations and scientific correctness. He substantiates his argument by referring his concept back to the process of data interpretation, which he perceives to be an epistemological and ethical problem if human beings are the object of study.

A fundamental problem of empirical research is that empirical data can never fully determine their interpretation. This problem is formulated by the 'underdetermination thesis', which states that "radically different theories can be supported equally on empirical grounds" (Teo 2011a, p. 245) and therefore, even contradictory interpretations are possible. Consequently, researchers have to speculate about how the obtained data can be interpreted and how it relates to theory. The presentation of data is more than just a description. Thus, he favours to acknowledge inherent speculation and labels it 'interpretative speculations' instead of 'empirical results'. Here, speculation is not seen in a pejorative manner, but this speculative moment in relating data to theory is seen to be a necessary part of the research process. Ignoring potential alternative interpretations may lure researchers into unknowingly committing acts of violence in the research process (Teo 2008, 2011a).

Interpretations of data have an important hermeneutic function. It is essential for the process of gaining and substantiating knowledge. During the process of collecting, analysing, interpreting and presenting data, meanings are imparted to make research outcomes understandable. By assigning meaning to data through the establishment of connections between theoretical and empirical propositions, a 'hermeneutic surplus' is created (Teo, 2010). The surplus is strictly necessary for the communication of research results and therefore not to be regarded as problematic per se. Already, in the symbolic representation of data, there is a surplus to the concrete data (Žižek 2004). Different pieces of information, which represent an individual or a group, are linked together in a symbolic network, which makes further meanings available. It is only because of this surplus, generated by the combination of data and interpretation, that data obtains meaning. As Thomas Teo (2008) explains further to understand concrete data an interpretative superstructure is needed that makes it comprehensible to the person that seeks to communicate their research outcomes and also for the reader. But he criticises the idea of empirical knowledge and the related 'rhetoric of facts' that presents this combination as facts. By presenting only a single interpretation as knowledge, the 'hermeneutic deficit' of having just one interpretation among many is turned into a hermeneutic surplus. This masks the relativity of interpretations of data, which manifests

in the dependence of their relevance upon the sociopolitical context of their time, and the dependence of their significance upon the particular hermeneutic context.

Interpretative speculations and the hermeneutic surplus can also be found in 'hermeneutic summaries'. Hermeneutic summaries present summarised results of different empirical studies and are therefore interpretations of interpretations. This format can be found in textbooks, reviews of handbooks, meta-analyses, and introductory sections of empirical articles (Teo 2010).

It should be noted that theories, too, contain speculations. Theories often are a result of a process of abstraction from a set of data based on various empirical studies. This process of abstraction always includes some level of speculation. Furthermore, it operates with particular axioms that cannot be 'tested', and hence premises of empirical studies hold moments of speculation, too (Teo 2008).

To sum up, the practice of not presenting alternatives to those interpretative speculations that construct the *Other* as inferior or problematic and lead to negative consequences for the *Other* is identified as epistemological violence.

IV. Analytical Framework

The analytical framework (Teo 2010, 2011a) - that is based on the concept of epistemological violence - seeks to identify violence through knowledge in research products. It offers three different contexts of reflection: The **context of discovery**, the **context of justification** and the **context of interpretation**. The different contexts overlap in the process of research and its presentation; the distinction is made for analytical purposes only (Teo 2011b). The context of discovery and the context of justification play a crucial role in the construction of data. The construction of a given data interpretation is located in the context of interpretation. Since the concept of epistemological violence strongly emphasises the role of data interpretation, the primary focus of the analysis lies within the context of interpretation. Within this context, the *impetus for action*, an impulse for creating a need for action, that is inherent in the problematization of the *Other* is categorized in a three-staged scheme.

In the following, the foci of the three different contexts are explained, and examples of research that are concerned with these contexts in mathematics education are mentioned.

Contexts of reflection

Central questions of the analyses of the **context of discovery** are: Is the underlying socio-historical, political, economic and personal background taken into account? How is knowledge about a certain subgroup constituted within those backgrounds? (Teo 2011a, 2011b). These backgrounds may be involved in the decision on whether to look for similarities or differences. Therefore, research hypotheses can already be violent. Since hypotheses are usually not presented as 'knowledge', 'violent hypotheses' would not be named epistemological violence, yet, the 'confirmation' of this hypothesis would fall into this category (Teo 2008). Of course, using the concept of epistemological violence entails the above-described perception on knowledge production within empirical research and the role of research in our current societal system.

Studies with different foci are concerned with the context of discovery in mathematics education. One example concerns the adaptation of constructs from other disciplines. Lisa Darragh (2016) takes a closer look at how 'identity' is used in mathematics education research. She figured out that research on identity within the field often lacks a definition of the construct and that it is not always clear if the study follows a sociological or a psychological framing. This manifests in research findings being at odds with the theoretical propositions stated in a given publication, or articles not containing any statements whatsoever on the chosen stance regarding the term identity. Another example is the researching research approach (Pais & Valero 2012), which seeks to uncover implicit assumptions in the background of mathematics education research that limit didactic research: It is always about learning, it is always about improving teaching and learning, and the specificity of mathematics education is only pointed out in order to differentiate from other fields of education. Conclusions of these two examples differ according to the focus, from making the background of a construct transparent to

asking different research questions that are based on a political conceptualisation of mathematics education as a whole.

In the analysis of the **context of justification**, the problem of representation is crucial. The question is how the research object (e.g. mathematics teachers, mathematics students) is represented in empirical and theoretical propositions. It furthermore asks how the environment is represented in the propositions (e.g. classroom, university lectures, communities) and how specific actions are represented that the research subject performs (e.g. filling out a questionnaire, teaching a class). Within the context of justification, the critique goes beyond selection biases and quality criteria in qualitative and quantitative research. It brings to question the very logic of research. (Teo 2008, 2011b).

The connection between epistemological violence and the idea of scientific correctness becomes most notably apparent in the overlap between the context of justification and the context of interpretation. Certain research strands in mathematics education are criticised for being deficit-oriented, for marginalising subgroups and for the reproduction of stereotypes (e.g. Gutiérrez 2008). Deficit models in educational contexts are characterised for example by 'victim blaming' - focusing on cognitive or/ and affective deficits of the studied subjects -, the oppression of a particular group and 'pseudoscientific' explanations that rely on a negative bias. However, it is claimed that deficit-research can be overcome with approaches that are sensitive to the backgrounds mentioned within the context of discovery (Frade, Acioly-Régnier, & Jun 2012).

The **context of interpretation** focuses on the relationship between the presented data and its discussion. Data interpretations predominantly found in the results-, discussion- and implication-section of empirical articles, and in hermeneutic summaries (Teo 2008, 2011a). Within this context, formulations in research products are identified as an act of epistemological violence.

By not taking into account the subject representation within the research stream of choice, one could unintentionally construct the *Other* in a way that was not intended. Anna Chronaki (2011) criticises that within hegemonic discourses of equity subjects are constructed with static identities, marginalised and voiceless, while within constructivist and socio-cultural approaches the subject is seen to make rational decisions as 'autonomous subject'. Both these conceptualisations of the subject [often not made

explicit] influence the interpretation of data and could also lead to having a negative impact on the *Other*.

The negative consequences that acts of epistemological violence have on the *Other* vary in their qualities, for example, from misrepresentation to the neglect of voices to statements of inferiority and policy recommendations. To acknowledge this, Thomas Teo (2008) differentiates between three levels of the impetus for action that a formulated problematization has on the *Other*. It can be interpreted as a scale, describing how directly it affects the studied group. A *descriptive interpretation* has the least impetus for action. Descriptive interpretations can appear, for example, in the reports of statistics, representing a subgroup as subordinate. A *normative interpretation* carries an ethical dimension through certain labels, words, and concepts that have a value-laden meaning. Normative interpretations have a middle impetus for action. Here a careful look has to be taken especially towards concepts in everyday language because many do have normative connotations. A *prescriptive interpretation* has the strongest impetus for action by expressing explicit recommendations. These recommendations, for example, can be the call for policy measures or concrete demands that concern the *Other* (Teo 2011b).

It should be noted, that not the speculation per se that empirical results could be explained by a specific characteristic that has a negative connotation (normative interpretation), nor speculation on what could be done to address a presumed negative condition (prescriptive interpretation), is termed epistemological violence, but the presentation of the *Other* to be inferior or problematic. What is criticised is that no alternative explanations are presented (or alternatives are ignored in the 'conclusion'-section), and this way, supposed 'knowledge' about the *Other* is construed.

V: Applying the Framework to research on teachers: An exemplary study of epistemological violence in the Journal of Mathematics Teacher Education

To provide an example, I applied the afore presented analytical framework to research outputs on in-service and prospective mathematics teachers. I chose this subgroup for two reasons: First, my own research interests are located in the field of prospective teachers' learning experiences in the university setting. Being involved in educating future

mathematics teachers and in a research project with the aim of improving teacher education in general, I am concerned with how future teachers are constructed in different discourses and how those discourses have an impact on this group. The discourses on prospective and in-service teachers are intertwined. Second, it is a group of relevance specific to mathematics education research. Therefore, the research community should be considered with the presentation of this group in different discourses and its implications.

Explicating my own context of justification: The teacher as the Other

The following studies have broadened my view of the context of justification concerning the representation of (future) teachers in different discourses on teachers and teaching. These articles have surely influenced my understanding of the contexts of the lines of argument in the research publications that I have analysed.

Alex Montecino and Paola Valero (2017) show how official documents present a picture of the teacher as a 'sales agent' of mathematics, who has to adapt to changing ideas and ideals to 'sell' her or his product. The authors reveal how the mathematics teacher is construed as in need of permanent training, and within this framing always has to remain incomplete. Following this official notion of teachers and teaching lays the trap of only describing teachers in terms of what is still needed for them to be 'complete' and thus only approaching their 'deficits'.

Eva Jablonka and Christer Bergsten (2017) focus on research discourses on 'good teaching'. They criticise the logic of research behind the signifier 'good teaching' and question common assumptions in recent studies that seek to promote specific actions that are identified with 'good teaching'. 'Good teaching', for example, was associated with the term of 'effective teaching', which does not stand alone but is related to students test scores. If following this logic, 'good teachers' would be first and foremost those that enhance students' test scores, while consuming the least economic and time resources.

Kathleen Nolan (2012), with her reference to symbolic violence in the practice of teacher education, focuses on the prospective mathematics teachers as they construct (and are constructed by) official pedagogical discourses, and draws attention to the trap of blaming this group for not adapting fast enough to theory-practice transitions, which she also observed in research discourses.

The official, research and pedagogical discourses are intermingled, and it can be assumed that they are influencing each other. By presenting prospective and in-service teachers as the reason why a certain desirable aim has not been reached (e.g. a fast transition between different phases of education), or a certain norm has not been accomplished, teachers are being problematised. Speaking in a speculative manner, this could lead to the assumption, that the problem lies within the group of teachers, the problem thus being attributable to the *Other*, leading to the conviction that interventions are needed.

Data and method

To provide an example, publications in the Journal of Mathematics Teacher Education (JTME) published in the years between 2012 and 2016 were analysed. In this time period, the Journal comprised 141 publications [113 papers, 27 Editorial Notes/ Introductions to Special Issues, and 1 Book Review]. This journal was chosen because it is specific to research on teachers and provides different theoretical and methodological approaches. It explicitly invites to consider "institutional, societal and cultural influences on teachers' learning", and welcomes "[c]ritical analyses of particular programmes, development initiatives, technology, assessment, teaching diverse populations and policy matters" (JMTE 2017). Therefore, the aims of the journal open up a space for reporting research findings within the thematic scope of teacher education and development without the need to focus the data interpretation on characteristics of the studied group.

The research products have been analysed following the logic of document analysis (using structuring techniques provided by Miles, Huberman, & Saldana 2013). The identification of epistemological violence in research products starts at the result-, discussion- and implication-section of empirical studies, followed by tracing back arguments to the introduction and method part. Also, presented data and their interpretations in hermeneutic summaries were considered.

Lines of argument that were of relevance for interpretations of data concerning in-service or prospective teachers were systematically followed through the research product to unravel how the *Other* is represented and how these interpretations were justified

within the specific background of the study: What arguments were presented? (How) Were those arguments backed up (either by references or within the publication)? How was the setting of the study described? What (implicit) pictures about teachers and their environment affected the data interpretation?

Publications, in which teachers were problematized, were rated according to their impetus for action: descriptive, normative, prescriptive interpretations. The boundaries between the different categories are fluid, and judgements rely on my own understanding.

Furthermore, publications were categorised according to the subgroup they focused on [in-service versus prospective teachers], and the methodological approaches [quantitative versus qualitative] and different theoretical stances were coded.

Instances of epistemological violence against teachers

In this non-representative sample, 21 publications contained epistemological violence against (future) teachers. The impetus for action of the presented data interpretations varied: 4 provided descriptive interpretations, 15 normative interpretations and 2 prescriptive interpretations. The methodological approaches of the publications varied strongly: Quantitative and qualitative, single case and large-sample studies, interventions and surveys. The underlying theoretical stances varied, too. In the following, findings are presented in the order of descriptive, normative and prescriptive interpretations.

One descriptive form of epistemological violence against teachers is the presentation of one group of teachers to be superior to another one. In the text, prospective Taiwanese teachers are described as "superior" (Lo & Luo 2012, p. 484) to US prospective teachers. Which is linked to higher ranks of Taiwanese students in PISA-studies [Programme for International Student Assessment] and TIMSS [Trends in International Mathematics and Science Study] and substantiated through citing different studies in which is claimed that US (prospective) teachers have "insufficient understanding of mathematics" (Lo & Luo 2012, p. 483). Since in the study, prospective Taiwanese teachers are found to have quite secure content knowledge, it is proposed that this serves as a benchmark for the US context, to "break the cycle" (Lo & Luo 2012, p. 497) of 'poor mathematics education' in the US.

In a hermeneutic summary of articles of a particular issue, the importance of change is highlighted, and it is expressed that teachers need to change their thinking and teaching to what is "being proposed to do" (Chapman 2016, p. 5). The role of teachers is to follow and adapt to the proposed way, which has been figured out by researchers. By depicting teachers of being a potential hindrance if not recognise the need to change and to understand the difference between their behaviour and what they shall do, another descriptive form leaves aside the teachers' voices.

One form of epistemological violence with a normative impetus for action manifests in the following line of argumentation: An intervention (e.g. in the form of professional development, or university course) is designed to address a particular 'deficit' in mathematics education. Undesired outcomes of this intervention are attributed to specific characteristics of (prospective) teachers alone, while the intervention is highlighted to be suitable to address the stated 'deficit'. This line of argumentation was found in a variety of different forms. One example text presented a professional development programme for in-service teachers that "works toward equity […] through teaching mathematics for understanding" (Rubel & Chu 2012, p. 42). Those who did not show the desired outcome of the intervention, where problematised for resisting to change their practices and beliefs. At the same time, the offered programme was pictured positively with examples of successful implementation (Rubel & Chu 2012).

In another example, teacher quality was linked to students achievement. In the 'rationale' of the article it was stated, that teachers need to change their practices for students to be successful in high school algebra. The teacher quality was said to be enhanced with an intervention described in the article. By applying an intervention-control-group-design, the study followed the logic of experimental research. Desired changes in teacher practices and dispositions, that "can help explain student achievement" (Hegedus, Tapper, & Dalton 2016, p. 11) were attributed to the intervention. The recommendation for "teachers to be open to changes in their practice" (Hegedus, Tapper, & Dalton 2016, p. 29) was stated.

The second form of epistemological violence with a normative impetus for action appeared in searching for the most efficient way to foster a desired goal. A specific group

or characteristics of the group is identified to be a hindrance for this endeavour. This occurred in one example text that presented a qualitative study. It is taken for granted that teachers need to improve their capabilities in teaching mathematics and, therefore, it was focussed on finding an effective intervention for improvement. The chosen framework, differentiated between various levels of "incompetence" (Geiger, Muir, & Lamb 2016, p. 462) and behaviours of the participating teachers were categorised in these levels. In the 'discussion and conclusion'-section, it was highlighted that a certain level of reflection is necessary so that teachers are capable of changing, in which researchers were presented to play a "crucial role" in "facilitating" this change (Geiger, Muir, & Lamb 2016, p. 472).

In linking a 'problematic' state of mathematics education to specific characteristics of in-service teachers, the third form of epistemological violence with a normative impetus for action occurred: In one publication, the state of mathematics education was described to be in crisis, despite several different efforts. The professional identity of teachers was established to be essential for 'good teaching'. Several characteristics of 'good teaching' were listed. Hence, the study focused on identity, self-perceived and actualised in the classroom, of prospective teachers in their practicum. Different observed behaviours (perceived as actualised identities) where described to be problematic. The self-perceived and the actualised identities were found to be not congruent, which was explained by either prospective teachers' misperception of their actual practice or the standards of 'good teaching' to be "not integrated effectively in their [identities]" (van Putten, Stols, & Howie 2014, p. 388). In the conclusion-section, the incongruency was linked to prospective teachers' capability of reflection. The need of guidance into practical means of reflection was postulated.

In another example, effective teaching was linked to the reduction of the resistance to algebra in secondary years of schooling, which was hypothesised to be due to the misconception of the subject matter. Teachers were said to often have a narrow understanding of the subject matter. After highlighting this negative picture of the state of algebra-education, a survey was administered to capture teachers' pedagogical content knowledge. Those teachers that scored below an expected level were labelled to have an "inadequate understanding" (Wilkie 2014, p. 418) and as one reason was provided that

teachers "may not comprehend the actual content in the curriculum" (Wilkie 2014, p. 420).

A fourth form appeared in publications that focused on specific courses or programmes for prospective teachers. In these publications, a desired aim of a course that either considered a specific content or affective-motivational factors were presented. If prospective teachers were not showing the intended results, it was attributed to characteristics of prospective teachers that fall into the affective-motivational or cognitive domain. In one example text, both domains are attended to. 'Progressive beliefs' related to the nature of mathematics and mathematics teaching and learning were presented to relate to 'successful student learning', and it is said that most prospective teachers "[fail] to hold progressive beliefs" (Weldeana & Abraham 2014, p. 303). Prospective teachers that did not exhibit a desired change despite an intervention were described to "[demonstrate] little interest"(p. 319). Overall the intervention is assessed positively, and it is stated that "most of the prospective teachers fail to detect their 'intellectual needs' in the learning of mathematics" (p. 321), if not exposed to the contents provided in the intervention.

In instances of epistemological violence with a prescriptive impetus for action, specific recommendations for practice were given. In one case, recommendations concerning in-service teachers are made, even though they have not even been participants in the particular study. The "importance of selecting mentors [mentor-teachers] with adequate PCK [pedagogical content knowledge]" (İmre & Akkoç 2012, p. 224) was stated. It was indicated, that in-service teachers in their role as mentor teachers may be a hindrance to the progress of prospective teachers. In-service teachers are thought to be a potential obstacle for educating prospective teachers effectively. In another publication about attitudes of prospective teachers, the need for "closely monitor[ing]" in-service teachers and their alignment with curricula (Afamasaga-Fuata'I & Sooaemalelagi 2014, p. 361) were presented. The idea of 'closely monitoring' implies a general mistrust and frames teachers as manageable items that can be repaired or removed from the system if not functioning correctly.

Recurrent elements in the different instances of epistemological violence against (prospective) teachers were that the line of argumentation built up on a short hermeneutic summary that painted a negative picture about the status quo. Consequently, practices of teachers shall be changed to improve students' learning (see Pais & Valero 2012). That teachers are in need of learning (see Montecino & Valero 2017) and shall be educated to teach effectively (see Jablonka & Bergsten 2017), as well as teachers' alignments to curricular norms and that teachers are in need of the help of researchers to change their practice were taken-for-granted. What is meant by the term 'effective teaching' was only clarified in one case.

VI. The scope and limits

The topic of research ethics that the concept of epistemological violence deals with is certainly not new to mathematics education research. In my opinion, the concept is a valueable addition to this field. I would argue that its narrow framing holds the potential to challenge argumentations that hide behind methodological excuses. It shifts the focus from technical considerations concerning data interpretation to ethical considerations of how the group that is researched is conceptualised and presented. So, it provides an opportunity for methodological critique irrespective of theoretical stances, offering a way of critique that does not reinforce fixed research approaches. The concept deliberately does not favour a specific research methodology or theoretical stance; it thus plays with the idea that one could judge different strands in an unbiased manner. Taking into account that researchers' understanding of society and their political orientation are always involved, this idea, of course, does not come without exception.

The concept focuses on a finalised text and thus cannot provide any insights into the conditions and considerations made in the process of its production, which would surely be a valuable extension. The presented findings do not allow any judgement about the authors, the quality of the journal in question, or about whether teachers were problematized intentionally or unintentionally.

I hesitate about the classification of instances of epistemological violence into the categories of different qualities of the impetus for action. In the context of mathematics education research, I am sceptical that it generates any additional yield. Maybe for the

specific context of educational research publications, a different set of categories could provide more insights into different qualities of epistemological violence. It should be acknowledged that mathematics education research has a strong normative component and this aspect as well as the strand of research that furthers specific educational approaches should not be played down lightly. Therefore, the differentiation between descriptive, normative and prescriptive might not be helpful to unravel the phenomenon further. The question whether further differentiated categories specific to the context of mathematics education could be productive, to me, is linked to the following questions: What is specific about mathematics education that affects the construction of the researched *Other*? Is there anything specific in contrast to other educational fields?

VII. Final thoughts

In confronting myself with this topic, I became doubtful that the ideal of a non-violent research is possible within the current societal system that frames and provides possibilities for the practice of research. I acknowledge that I myself struggle to express my academic thoughts in a language that is non-violent and that my own academic ideas and interpretations of data are not always free of those lines of argumentation that I criticise.

In striving for my ideal, I find the idea of Ubiratàn D'Ambrósio (2015) promising: He argues that we should start thinking outside of our 'epistemological cage' if we want to start ending violent acts in education and educational research. Thinking about and presenting different interpretations of our empirical data that possibly are not in accordance with our initial interpretation could challenge our epistemological cage. One step towards freedom from the epistemological cage would be to deny the position of the research discourse as neutral knowledge. The question whether this practice would contribute to eliminating violence from academia, or whether violence would then manifest itself in a different form remains open.

As Mônica Mesquita (2017) elaborates, our research is located within the capitalist wile, and we should not be so naïve to think we are independent of the societal system we live in. Bringing this thought together with Slavoj Žižek's (2008) argument

that our economic and political system needs violence to reproduce itself, I am doubtful of whether a non-violent research is possible. Maybe, within this system, we cannot eliminate violence in mathematics education and mathematics education research. But, at least, it would be a disturbance to start striving to be non-violent and to not participate in the reproduction of violence.

I prefer to not end this contribution by speculating on if and how it is possible to not participate in the reproduction of violence. Rather I would like to end this contribution with an invitation to an open discussion about violence through mathematics education research:

- How should we deal with instances of (epistemological) violence as a research community?
- Should we use the notion of violence, which is always coming along with a moral impetus?
- Should we address this within terms of scientific correctness?

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References

Afamasaga-Fuata'i, K., & Sooaemalelagi, L. (2014). Student teachers' mathematics attitudes, authentic investigations and use of metacognitive tools. *Journal of Mathematics Teacher Education, 17*(4), 331-368.

Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge: Cambridge university press.

Bourdieu, P. (1990). *In other words: Essays toward a reflexive sociology*. Cambridge: Polity Press.

Chapman, O. (2016). Approaches and challenges in supporting mathematics teachers' change. *Journal of Mathematics Teacher Education, 19*(1), 1-5.

Chronaki, A. (2011). Disrupting 'development' as the quality/equity discourse: Cyborgs and the subalterns in school technoscience. In B. Atweh, M. Graven, W. Secada, & P. Valero (Eds.), *Mapping equity and quality in mathematics education* (pp. 3–19). New York: Springer.

Darragh, L. (2016). Identity research in mathematics education. *Educational Studies in Mathematics, 93*(1), 19-33.

D'Ambrósio, U. (2009). A nonkilling mathematics?. In J. E. Pim (Ed.), *Toward a nonkilling paradigm* (pp. 241-268). Honolulu: Center for Global Nonkilling.

D'Ambrósio, U. (2015). From mathematics education and society to mathematics education and a sustainable civilization: A threat, an appeal, and a proposal. In S. Mukhophadhyay, & B. Greer (Eds.), *Proceedings of the eighth international Mathematics Education and Society* (pp. 19-30). Portland, OR: Ooligan Press.

Frade, C., Acioly-Régnier, N., & Jun, L. (2012). Beyond deficit models of learning mathematics: Socio-cultural directions for change and research. In M. K. Clements, A. Bishop, C. Keitel-Kreidt, J. Kilpatrick, & F. K. S. Leung (Eds.). *Third international handbook of mathematics education* (Vol. 27) (pp. 101-144). New York: Springer.

Geiger, V., Muir, T., & Lamb, J. (2016). Video-stimulated recall as a catalyst for teacher professional learning. *Journal of Mathematics Teacher Education, 19*(5), 457–475.

Gutiérrez, R. (2008). A 'gap-gazing' fetish in mathematics education? Problematizing research on the achievement gap. *Journal for Research in Mathematics Education*, 39(4), 357–364.

Hegedus, S.-J., Tapper, J., & Dalton, S. (2016). Exploring how teacher-related factors relate to student achievement in learning advanced algebra in technology-enhanced classrooms. *Journal of Mathematics Teacher Education, 19*(1), 7–32.

İmre, S. Y., & Akkoç, H. (2012). Investigating the development of prospective mathematics teachers' pedagogical content knowledge of generalising number patterns through school practicum. *Journal of Mathematics Teacher Education, 15*(3), 207-226.

Jablonka, E., & Bergsten, C. (2017). Installing 'good mathematics teaching': Hegemonic strategies and alliances of researchers. In H. Straehler-Pohl, N. Bohlmann, & A. Pais (Eds.). *The disorder of mathematics education: Challenging the socio-political dimensions of research* (pp. 107-120). New York: Springer.

Jorgensen, R., Gates, P., & Roper, V. (2014). Structural exclusion through school mathematics: Using Bourdieu to understand mathematics as a social practice. *Educational Studies in Mathematics, 87*(2), 221-239.

Journal of Mathematics Teacher Education [JMTE]. (2017). *Journal of Mathematics Teacher Education: Aims and Scope*. Retrieved October 7, 2017 from http://www.springer.com/education+%26+language/mathematics+education/journal/10857

Journal of Mathematics Teacher Education [JMTE]. (2012). *Journal of Mathematics Teacher Education, 15*(1–6), 1–500.

Journal of Mathematics Teacher Education [JMTE]. (2013). *Journal of Mathematics Teacher Education, 16(*1–6), 1–482.

Journal of Mathematics Teacher Education [JMTE]. (2014). *Journal of Mathematics Teacher Education, 17*(1–6), 1–582.

Journal of Mathematics Teacher Education [JMTE]. (2015). *Journal of Mathematics Teacher Education, 18*(1–6), 1–601.

Journal of Mathematics Teacher Education [JMTE]. (2016). *Journal of Mathematics Teacher Education, 19*(1–6), 1–594.

Lo, J.-J., & Luo, F. (2012). Prospective elementary teachers' knowledge of fraction division. *Journal of Mathematics Teacher Education, 15(*6), 481–500.

Mesquita, M. (2017). Urban[Boundaries] Space. Disturbing choices and the place of the critical research/researcher in the capitalist wile. In H. Straehler-Pohl, N. Bohlmann, & A. Pais (Eds.). *The disorder of mathematics education: Challenging the socio-political dimensions of research* (pp. 307-319). New York: Springer.

Miles, M. B., Huberman, A. M., & Saldana, J. (2013). *Qualitative data analysis*. Los Angeles: Sage.

Montecino, A., & Valero, P. (2017). Mathematics teachers as products and agents: To be and not to be - that's the point!. In H. Straehler-Pohl, N. Bohlmann, & A. Pais (Eds.). *The disorder of mathematics education: Challenging the socio-political dimensions of research* (pp. 135-152). New York: Springer.

Morgan, C. (2017). Communicating research in mathematics education: Theoretical and ethical problems. In H. Straehler-Pohl, N. Bohlmann, & A. Pais, (Eds.) (2017). *The disorder of mathematics education: Challenging the socio-political dimensions of research* (pp. 121-134). New York, NY: Springer.

Nolan, K. (2012). Dispositions in the field: Viewing mathematics teacher education through the lens of Bourdieu's social field theory. *Educational studies in Mathematics, 80*(1-2), 201-215.

Pais, A. (2017). The narcissism of mathematics education. In H. Straehler-Pohl, N. Bohlmann, & A. Pais (Eds.). *The disorder of mathematics education: Challenging the socio-political dimensions of research* (pp. 53-63). New York: Springer.

Pais, A., & Valero, P. (2012). Researching research: Mathematics education in the political. *Educational Studies in Mathematics, 80*(1-2), 9-24.

Parker, I. (2005). Lacan, die Psychologie und der Diskurs der Universität. *Psychologie und Gesellschaftskritik, 29*(3/4), 151-173.

Rubel, L.-H. & Chu, H. (2012). Reinscribing urban: Teaching high school mathematics in low income, urban communities of color. *Journal of Mathematics Teacher Education, 15*(1), 39–52.

Spivak, G. C. (1988). Can the subaltern speak?. In C. Nelson & L. Grossberg (Eds.), *Marxism and the interpretation of culture* (pp. 271–313). Urbana: University of Illinois Press.

Straehler-Pohl, H., Bohlmann, N., & Pais, A. (Eds.) (2017). *The disorder of mathematics education: Challenging the socio-political dimensions of research*. New York: Springer.

Teo, T. (2008). From speculation to epistemological violence in psychology: A critical-hermeneutic reconstruction. *Theory & Psychology, 18*(1), 47-67.

Teo, T. (2010). What is epistemological violence in the empirical social sciences*?. Social and Personality Psychology Compass, 4*(5), 295-303.

Teo, T. (2011a). Empirical race psychology and the hermeneutics of epistemological violence. *Human Studies, 34*(3), 237-255.

Teo, T. (2011b). Theory and empirical research: Can scientific ideas be violent?. In P. Stenner, J. Cromby, J. Motzkau, J. Yen, & Y. Haosheng (Eds.), *Theoretical psychology: Global transformations and challenges* (pp. 239–246). Ontario: Captus.

van Putten, S., Stols, G., & Howie, S. (2014). Do prospective mathematics teachers teach who they say they are?. *Journal of Mathematics Teacher Education, 17(*4), 369–392.

Weldeana, H. N., & Abraham, S. T. (2014). The effect of an historical perspective on prospective teachers' beliefs in learning mathematics. *Journal of Mathematics Teacher Education, 17*(4), 303-330.

Wilkie, K. J. (2014). Upper primary school teachers' mathematical knowledge for teaching functional thinking in algebra. *Journal of Mathematics Teacher Education, 17*(5), 397–428.

World Health Organisation [WHO]. (2017). *Health topics: Violence*. Retrieved October 7, 2017 from http://www.who.int/topics/violence/en/

Žižek, S. (2004). The structure of domination today: A Lacanian view. *Studies in East European Thought, 56*(4), 383-403.

Žižek, S. (2008). *Violence: Six sideways reflections*. London: Profile.