

2. Epistemic Violence as a Violence on Subjectification

Violence on the Thinking-Being-Becoming Continuum

I had ventured outside the human community, landed beyond the moral universe, beyond the realm of predictable events and comprehensible actions, and I didn't know how to get back.

Susan Brison, Aftermath (2003), xv-xvi

2.1 Violence as a Continuum

Epistemic Violence and Other Forms of Violence

Chapter One has established *Mathematics* as an Image of Thinking-Being that emerges from the *Mathematics-Rationality-Human* Continuum. All three players of this continuum share the epistemic value and framework of universalism and the generalization of specifically Western images of thinking-being (cf. e.g. Wynter 2003, Fanon 2021, Braidotti 2020, – 2018).

This second chapter explores the role of *Mathematics* and the *Mathematics-Rationality-Human* Continuum in contemporary relations of power. The notion of *epistemic violence* guides this endeavor. As I established in the introduction to this thesis, I understand the notion of epistemic violence through the work of Sylvia Wynter and in close relation with the theoretical movement of New Humanism. In this understanding, epistemic violence at its core is a hegemonic exclusion from the notion of *the Human*. Considering the thinking-being of *the Human* is created and kept alive through the *Mathematics-Rationality-Human* Continuum, as we have witnessed in chapter one, understanding *the Human* as epistemically violent calls for an exploration of the entire continuum in rela-

tion to epistemic violence. In this endeavor I draw from feminist and decolonial work on the epistemic violence of *Rationality* and *the Human*. In what follows, I will explore a) how *Mathematics* might unfold epistemic violence and b) relate these findings on the epistemic violence of *Mathematics* back to the *Mathematics-Rationality-Human* Continuum.

I understand different forms of violence as building a continuum of violence. Epistemic violence is a distinct form of violence, but not one that can be separated from other forms of violence. Epistemic violence continuously unfolds its precisely through its interwovenness with other forms of violence. Throughout this chapter sexual violence will function as a case study to illustrate the interwovenness of epistemic violence with other forms of violence. I understand sexual violence as any violence enfolded within the realm of sexuality and thus as a form of violence that always already bears an epistemic dimension. The epistemic dimensions of sexual violence will be explored in this chapter through an exemplary case that shows how epistemic violence builds a continuum with other modes of violence. The exclusion from *the human* in both concept and practice is what I understand as the common denominator moving through all forms of violence. Violence is the practice that actualizes the exclusion from *the human*, which happens because of the conceptual exclusion from *the human*, which, also realizes this very exclusion at the same time. The exclusive conception of *the human* causing the *human*-centric world of violences is *the human* that is birthed by the *Mathematics-Rationality-Human* continuum.

Sexual violence is a violence that grows from within the world that the *Mathematics-Rationality-Human* continuum builds. Sexual violence, as I understand it, is a practice of excluding as a being from the realm of *the human*. This exclusion occurs along various dimensions, which will be explored. Firstly, living through sexual violence bears the potentiality to hinder the victim-survivor in their self-understanding as *human* and thus to alter the conditions of their participation in being and becoming *human*. But even before the aftermath of sexual violence – to lean on the words of Susan Brison here (Brison 2002) – the violence itself, I will argue, comes from a place of the exclusive human. Women are subjected to sexual violence especially often precisely because they are less-human than men in the world of the *Mathematics-Rationality-Human* continuum because their thinking-being is less accounted for in the continuum-based notion of *the human*. Women of color are subjected to even more sexual violence because their thinking-being is even less accounted for in *the human* birthed by the continuum. Autistic women too are subjected to sexual violence in especially high numbers because their thinking-being too is largely

unaccounted for and largely excluded from the continuum-based *human*. And it is these exclusions from *the human* that birth many floods of sexual violence in which sexual violation is a practice of being treated someone as *not-quite-human* – it is the practice of the conceptual exclusion from the human – the consequence of being unaccounted for.

The objective of this chapter is to explore the consequences of the *Mathematics-Rationality-Human* Continuum through my notion of epistemic violence. This endeavor entails examining the consequences and dimensions of epistemic violence and their interwovenness with other forms of violence. For this aspect of chapter two, I mainly rely on three terms that I understand as inextricably interwoven: meaning-making, sense-making, and subjectification. Meaning-making describes how the attribution of meaning is formed, while sense-making, as a term, centers sensing and feeling in order to establish that epistemic violence not only permeates the analytic, definitory attribution of meaning, but rather affects all areas of minds and bodies. Subjectification is employed to explore the depth of this shaping of sense-making. Black Studies scholars such as W.E.B. du Bois (1994) and Sylvia Wynter (2003) or sexual assault survivors such as Susan Brison (2002), have established the that systems of sense-making and whether our experiences fit within these systems or not, shapes how simple or hard it is for us to understand ourselves as *human* – or as rational, as *thinking* – mathematically or otherwise. I employ the term subjectification to account for this experience – this systemic hardship in knowing oneself to be *human*. My study in this chapter asks how the *Mathematics-Rationality-Human* Continuum shapes these interwoven areas of meaning-making, sense-making, and subjectification.

This chapter moves at three levels- Firstly, I study the thinking-being produced and legitimated through the *Mathematics-Rationality-Human* Continuum. Secondly, I study how the continuum and the thinking-being it allows and disallows affects processes of meaning-making, sense-making, and subjectification. Thirdly, I further develop my notion of epistemic violence by relating it to the *Mathematics-Rationality-Human* Continuum.

From chapter one, we know that epistemic violence is not purely epistemic because the epistemic and the ontological build a continuum: So, I understand epistemic violence as a violence inflicted on thinking-being and a violence that shapes and limits possibilities for thinking-being. From chapter one, we also know that the *Mathematics-Rationality-Human* Continuum builds images of thinking-being. So, now, we need to understand the implications of these images of thinking-being formed through the continuum. The notion of epis-

temic violence guides this exploration into the politics of power built into and built through the *Mathematics-Rationality-Human* Continuum.

I understand explorations of epistemic violence as explorations of the intricacies of different forms of violence as I understand epistemic violence to build a continuum with other forms of violence. This relationality and continuum of violence of which epistemic violence is part, is examined throughout this chapter. Understanding epistemic violence as a violence enacted upon thinking-being – as a silencing of marginalized modes of thinking-being, emphasizes how epistemic violence moves in a world of interrelated continua.

I proceed in six steps:

First, I introduce the current state of research on patriarchal and colonial dimensions of *Mathematics* and relate these findings to my understanding of epistemic violence. Particularly central here is the discussion of the works of Denise Ferreira da Silva (2017), Bonnie Shulman (1996), and Sara N. Hottinger (2017).

Second, I explore varying dimensions of epistemic violence. I explore how epistemic violence affects meaning-making, sense-making, and subjectification by making use of illustrative case studies in each step.

Third, I examine the notion of *credibility* in relation to the *Mathematics-Rationality-Human* Continuum.

Fourth, I explore the politics of interpretation built by the *Mathematics-Rationality-Human* Continuum.

Fifth, I examine the relation of binarism to *Mathematics* and epistemic violence.

Sixth, I close the chapter with discussing of my findings on: a) specific ways in which *Mathematics* enfold epistemic violence and b) as part of a broader examination of the epistemic violence of the *Mathematics-Rationality-Human* Continuum.

2.2 The Depth of the Continuum

The *Man*-centric World is the *Mathematics*-centric World

Now that my historical reconstruction has established the many lives of the *Mathematics-Rationality-Human* continuum, it is time to listen in on what the lives of the continuum engender. What are the continua of violence caused by the continuum? What sorts of lives does *Mathematics* as an image of thinking-

being live in these worlds of violence fashioned by the *Mathematics-Rationality-Human* continuum?

My first endeavor of examining this will draw from the work of sociologist Sara Hottinger, philosopher Bonnie Shulman, and philosopher Denise Ferreira da Silva, who have all previously examined *Mathematics* in relation to colonial-patriarchal worlds of violence. I will explore their respective work in relation to my notion of the *Mathematics-Rationality-Human* continuum.

This endeavor is guided by my notion of epistemic violence as a violence enacted upon thinking-being, i.e., a violence that shuts down the more-than and a movement of limitation that hinders what Erin Manning calls *emergent creaturing*¹. Epistemic violence is a living body, and its heart is the exclusive *human* – the *human* birthed by the *Mathematics-Rationality-Human* continuum. This exclusive *human* is both a notion and a mode of thinking-being, which builds a continuum with other notions and modes as well as with other images of thinking-being, namely *Rationality* and *Mathematics*.

The examination that follows seeks to bring the work of Hottinger, Shulman, and da Silva in conversation with my understanding of epistemic violence and of the *Mathematics-Rationality-Human* continuum. This will provide a more concrete account of the other images of thinking-being that are entangled in the constant making and re-making of the *Mathematics-Rationality-Human* continuum. As such, this analysis creates an opening for further exploration of epistemic violence in its relationality to other forms of violence and in its lives and consequences. Furthermore, drawing from Hottinger, Shulman, and da Silva will establish three core aspects of thinking-being that enfold epistemic violence: *Rationality*, *Necessity*, *Binarity*.

In 2017 Hottinger published, her remarkable discursive analysis of how the notion of the *Mathematician* is constructed in Western discourse. However, what she finds exceeds a study of a representation of *Mathematicians* because she comes to study what she terms *Mathematical subjectivity*, i.e., a notion and a mode of subjectivity that references *Mathematics* as an image of thinking-being. Much like I do with my notion of the *Mathematics-Rationality-Human* continuum, Hottinger too emphasizes how subjectivity derived from *Mathematics* exists in relationality to other images of thinking-being:

1 The notion of emergent creaturing is established by Erin Manning in *For a Pragmatics of the Useless* as an expression for relationality that is not human, but more-than human or as she puts it the 'coming into relation' that does not hinder all that is in non-accordance with *the human* (Manning 2020, 63).

I trace the entangled relationship between the construction of mathematical subjectivity and the construction of Western rationality and subjectivity; these constructions both define what it means to be human and limit who is allowed to see themselves within that ideal.

Inventing the Mathematician, 47

Hottinger establishes how *Mathematical subjectivity* is an implicit point of reference for Western concepts of *Rationality* and *subjectivity*. Through the life of *Mathematics* within *Rationality* and *subjectivity*, *Mathematics* becomes part of 'what it means to be human.' This is precisely what my notion of the *Mathematics-Rationality-Human* continuum describes in its portrayal of *Mathematics* as an image of thinking-being and as a form of inhabiting subjectivity, which is mutually interwoven with *the Rational* and *the Human* as images of thinking-being and as modes of subjectivity. Hottinger too understands the interwovenness of *Mathematics* with *the Rational* and *the Human* in relation to power relations when she writes: "Those who are Othered in the West are also Othered (conceptualized as 'the other' to an alleged norm) in mathematics" (Hottinger 2017, 163). Here Hottinger asserts that *Mathematical subjectivity*, like *Rationality* and the *Human*, is interwoven with the question of who is 'the other.' and *Mathematics*, as an image of thinking-being, constructs who is 'the normal human' and who is not – it makes 'the other,' in concert with *Rationality* and *the Human* as images of thinking-being.

In her analysis of Othering constructed through *Mathematical subjectivity*, Hottinger centers *race*, *gender*, and *class*. as it is femininity, blackness, and non-bourgeois social classes that are excluded from the *Mathematical*, from *the Rational*, and *the Human*. The notion of *Rationality* is a central mediator in the *Mathematics-Human* continuum and bears many histories of colonial-patriarchal exclusion that have been brilliantly examined by scholars such as Sylvia Wynter (e.g. 1994, 2003, 2006) and Sandra Harding (e.g. 1982). Hottinger writes the following on the relation of *the feminine* and *the Rational*:

We, as a culture, simply cannot process the feminine in relation to mathematical rationality. [...] as a culture we understand reason, rationality, and mathematics and antithetical to the feminine.

Inventing the Mathematician, 46

Hottinger here further establishes *Mathematics* as a mode of *Rationality* that comes into existence precisely through and because of its exclusion of *feminine*

modes of thinking-being. Just like *reason* and *Rationality*, *Mathematical thinking* comes into itself as an image of thinking-being through its construction in opposition to *the feminine*. This is to say, *Mathematics* as an image of thinking-being moves with a binary conception of gender in its heart and bones and this binary conception exists through the hierarchized *Rationality-Emotionality* binary.

In my historical reconstruction of *Mathematics*, I have established that the logic of the binary and the logic of separability move through *Mathematics* deeply and characteristically. This is to say that *Mathematics* as a mode of thinking-being draws from existing dualisms – such as the *Rationality-Emotionality* dualism and from a general invocation to think within a logic of binary and a logic of separation. The logic of the binary thus fashions *Mathematics* and is fashioned and authorized my *Mathematics* at the same time.

Shulman too examines this mode of thinking and identifies it, as Hottinger does, with Western intellectual history:

Our Western theories are so dominated by the oppositions between mind/body, emotion/reason, thought/desire (and the linkages with rational masculinity and emotional bodily femininity), that we find it almost impossible to conceive of reality in any other terms.

What If We Change Our Axioms?, 432

Shulman thus establishes the normalization of hierarchized dualism as embedded so deeply into Western understandings of *thinking* that they automatically structure our sensing and meaning-making of the world and our very ways of living. She situates this inclination to dualism, to take up the logic of perceiving the world with notion of binarity in its political dimension:

Since the Sophists were Plato's political as well as philosophical rivals, the defeat had to be final, not merely a debate between rhetorical systems. Logic had to be defensible as reflective of a higher reality. It had to appear to be above and beyond any political agenda. Thus, it was necessary to assert the independent and prior reality of these Platonic Forms if the dialectical practice was to have final authority.

What If We Change Our Axioms?, 434–435

Shulman situates *axiomatic Mathematics* as having its origins in Ancient Greek philosophy and contextualizes it by reference to how the in the concept of 'a

knowledge with final authority' as we have witnessed it in Plato's construction of *Mathematics*, is intrinsically political because it implies a search for a final, untouchable knowledge. It is also intrinsically political, in the sense described by philosopher Isabelle Stengers as a question of authority (Stenger 2000, 102 f.). So, the 'epistemic certainty' conflated with *Mathematics* by Plato, Aristotle, Descartes, and Kant as well as Pinker and Ellenberg is to be understood as a struggle for epistemic authority – that is a struggle for political authority. Shulman further explores this in relation to the axiomatic method as an *image of (Mathematical) thinking*:

This view of mathematics as a deductive system is linked with the assumption that mathematics constitutes a body of infallible or absolute truths. [...] *Upapatti*, or the Indian proof, is viewed as a 'convincing' demonstration [...]. [...] the *Upapatti* are not about 'compelling assent' but rather are more concerned with communication than control [...].

This draws attention to the distinction between utility and verisimilitude (workability and truth) as the goal of knowledge-making. Workability is defined from within particular projects situated at a time and place. Truth is defined by standardized methods (obedience to predetermined criteria) which deny contingent and subjective intrusions [...].

What If We Change Our Axioms?, 436

A politicized understanding of the notion of *proof* helps us see how a distinct notion of *proving* arises in the context of the *Mathematics-Rationality-Human* continuum. A notion in which, as the conceptualization of *Mathematics* as a 'body of infallible truth' is upheld through a distinctly Western notion of *proving* that is understood as an intellectual method bringing about 'infallible knowledge.' The *Mathematics-Rationality-Human* continuum and the epistemic violence it births thus move with this distinct notion of *proving* as one of the modes of thinking-being that is made by and upholds the continuum-based world. This notion of *proving* and its interwovenness with the concept of *Mathematical necessity* thus have direct bearings upon questions of subjectivity – as the work of da Silva teaches us:

When considering the "Subject without properties" it is always helpful to recall [how it emerged] to describe the world in such a way as to make it possible to establish that the human mind can know the truth of things in it without the need for divine revelation? [...]

For Descartes locates efficient causality in the very movement of thought

that establishes *I think, therefore I am* as the ultimate ground for ontological and epistemological statements. He was not the first or the only one to make a case for replacing syllogistic logic with mathematical necessity; Galileo had done the same.

$$(life) \div 0 (blackness) = \infty - \infty \text{ or } \infty / \infty, 4-6$$

Da Silva speaks of the 'subject without properties' as a distinctly white and Eurocentric understanding of *the subject*. Such an understanding in which – the subject is supposedly 'neutral,' and *without properties*. She contextualizes this notion of subjectivity as an answer and a reaction to a conception of *the human* as other to the world and to truth that emerges when one seeks to both conceptualize *the human* as a 'subject without properties,' while still conceptualizing *the human* as 'having access to truth.' Resultingly, a distinct notion of *subjectivity* arises – one in which the notion of *Mathematical necessity* becomes the cornerstone for existence: the *proof* for being. Da Silva further examines this notion of Mathematical necessity and the lives it lives:

Both the scientific and ethical figurings of determinacy would enter into nineteenth-century scientific accounts of human difference, which produced the notions of racial and cultural difference. [...] Further, these procedures deploy the European/white mind as the universal gauge, since it alone shares a key quality with universal reason [...], namely, self-determination. In this way, this earlier moment of racial knowledge yielded indexes of human difference [...] that transformed economic differences resulting from conquest, colonization, settlement, and enslavement into presentations of [...] universal reason [...].

$$(life) \div 0 (blackness) = \infty - \infty \text{ or } \infty / \infty, 10$$

Da Silva understands *Mathematical necessity* to be part of the conceptual underpinnings of the idea of *determinacy* that shapes conceptualizations of 'human difference.' The notions of *Mathematical necessity* and *determinacy* birth the notion of *universal reason* that characterizes and universalizes the notion of *the human* as European/white. It is therefore distinctly the notion of *necessity* – a notion birthed through *Mathematics* as an image of thinking-being – that establishes this universalization. *Mathematics* is part of forming the universalization of the European/white human by instituting *necessity* as a notion that legitimizes and conceptually de-politicizes universalization. The universalization of one mode of being *human* is what brings about the world, in which some life *matters* more – possess more *value* – than another life:

Why don't black lives matter? [...]

Let me briefly elaborate on this by situating blackness in the Kantian design of the modern ethical scene of value. Here, as we know, the guiding ethical entity is humanity, which Kant describes as the sole existing things possessing dignity, that is, possessing intrinsic value. Among existing things, humanity [...] alone shares in the determining powers of universal reason, since it alone has free will, or self-determination. [...]

My point here is that the very arsenal designed to determine and to ascertain the truth of human difference already assumed Europeanness/whiteness as the universal measure, that is, as the bodily, mental, and societal actualization of universality.

$(\text{life}) \div 0 (\text{blackness}) = \infty - \infty \text{ or } \infty / \infty, 11$

Da Silva here establishes how we come to inhabit a world in which 'black lives don't matter.' *The human*, as conceptualized by Kant, is the only creature possessing intrinsic value. This value is ascribed only to this particular mode of being *human* through the notion of universal reason. It is therefore the *thinking* the being in question partakes in that decides the value ascribed to the life of that respective being and its status as a being. *Mathematics* shapes which *thinking* is the *universal thinking* – which *thinking* is the *thinking* that qualifies one as *human*, which makes one's life possess intrinsic value. As such, the *Mathematics-Rationality-Human* continuum governs whose lives are *human lives* and thus *lives of value*.

The work of da Silva bears crucial similarities to the work of Sylvia Wynter on the exclusivity of *the human*. Wynter speaks of the *Man*-centric world as the world that creates a universalized, but distinctly male and Western version of *the human*. This *Man*-centric world is the *Mathematics*-centric world too. Building on the work of da Silva, as we can derive that it is *Mathematics* that conceptually determines the universalized *human*. The notion of the *Mathematics-Rationality-Human* continuum aims to speak to this relation and to the relation of the *Man*-centric world as being the *Math*-centric world too.

Through thinking-with Hottinger, Shulman, and da Silva I identify three aspects of *Mathematics* as an epistemically violent image of thinking-being: a) the logic of *binary*, b) the notion of *necessity*, and c) the notion of *proving*. I will further explore each of these three aspects in its respective relation to *Mathematics* as an image for thinking-being.

The aim of this examination is twofold: First, to further make sense of *Mathematics* as a form of epistemic violence. Second, to situate epistemic violence as a form of violence that builds a continuum with other forms of violence.

2.3 Violence as a Continuum

Sense-Making, Meaning-Making, and Subjectification in the *Mathematics*-centric World

Before examining the three epistemically violent aspects to *Mathematics* I have just established, I will deepen my account of epistemic violence building a continuum with various other forms of violence. I understand epistemic violence to affect sense-making, meaning-making, and subjectification in a limiting manner that is in a manner that deepens the exclusion of marginalized positions and their thinking-beings.

Both sense-making and meaning-making are shaped by epistemic violence and actualize epistemic violence through the exclusions they carry out. I understand both notions in inextricable interwovenness with epistemic violence and *the human* as the epistemically violent exclusions from the human are woven in and carried out through normalized practices of sense-making and meaning-making. My notion of epistemic violence conceptually guides this chapter and will therefore take up the most space. However, sense-making and meaning-making are always being echoed whenever I utter the notion of epistemic violence because they are how the exclusions from *the human* – that I term epistemic violence – are continuously made, actualized, and transhistorically kept alive.

As I have established before I believe the exclusivity of the notion of *the human* to live at the very core of epistemic violence and to be the heartbeat of violence more generally. I will establish here that sense-making, meaning-making, and subjectification are interwoven with one another and live in a relationship of mutual construction with the exclusive *human*. Thereby, the limitations placed on the forms given to sense-making, meaning-making, and subjectification by the epistemic violence of the continuum, uphold the exclusivity of *the human*.

Let me further establish this account by recalling Wynter:

[...] we [the blacks] are the bearers of "human otherness" to the West's conception of "Man." If we are the bearers of "human otherness," it means that

the world of the human remains subordinated to the world of "Man."
Sylvia Wynter, PROUD FLESH INTER/VIEWS: SYLVIA WYNTER, 15

The Man is the universalized 'genre of being human.' It is the thinking-being of *the human* that is brought to life and kept alive by the *Mathematics-Rationality-Human* continuum. And as Wynter writes this exclusive image of thinking-being call the *human* construes black lives as the ones 'other to the human.'

In other parts of her work Wynter establishes that the universalized *human* is not only white, but also *male* and *bourgeois* as *the human* universalizes the very distinct lives and the thinking-beings, of those with the most power historically (Wynter 2006 B).

As I have briefly established in the beginning of this chapter, I understand there to be a relation of *the human* to sexual violence constituted by many lives. This is one of the many consequences of what Wynter describes as the exclusivity of *the human* and as da Silva established – over whose lives possess value. It is *the human* that governs whose bodies and whose sexualities are of 'intrinsic value' as well as whose sexual bodies and bodyings are human enough to remain unscathed and unviolated. It determines the degree to which one's thinking-being participates in the thinking-being of *the human* that decides one's vulnerability to sexual violence. Furthermore, once a person has lived through sexual violence, they will be estranged from the realm of *the human* precisely because of their survival and the violence they have lived through:

Ten years ago, a few months after I had survived a nearly fatal sexual assault and attempted murder in the south of France, I sat down at my computer to write about it for the first time and all I could come up with was a list of paradoxes. Things had stopped making sense. [...] I turned to philosophy for meaning and consolation and could find neither. Had my reasoning broken down? Or was it the breakdown of reason? I couldn't explain what had happened to me. [...] I had ventured outside the human community, landed beyond the moral universe, beyond the realm of predictable events and comprehensible actions, and I didn't know how to get back.

Aftermath, Susan Brison, ix-x

Susan Brison describes the afterlife of her survival of rape as one in which she '*had ventured outside the human community*'. She arrives at this feeling, this conclusion of her non-humanness after having detailed how her writing and her thinking consist of *contractions* since surviving the assault whereby it is her

thinking – in particular her *thinking* in contradictions – that excludes her from being *human*. As we have witnessed in the historical reconstruction of *Mathematics*, contradiction is constructed as the ultimate irrationality and the ultimate signifier of error, and of falsity. This concept of ‘the contradiction as a signifier of error’ is authorized through *Mathematics* as an image of thinking-being and through the notion of *Mathematical proving*. So, Brison describes thinking and writing in contradictions and feeling that ‘her reason broke down.’ As such, she considers her own non-humanness to be a consequence of the feeling of ‘a breakdown of reason’ because in the world authored by the *Mathematics-Rationality-Human* continuum, it is the participation in reason, and in this particular thinking that qualifies one as human. Brison’s survival, however, makes her inhabit a thinking-being in non-accordance with the thinking-being of *reason*. Her survival makes her inhabit a thinking-being that is excluded from *the human*.

As she can no longer sense herself as *human*, she cannot attribute meaning to her experience by the modes of thinking she had previously known and cannot inhabit a ‘human subjectivity’. As a result, these interwoven layers of epistemic violence shape her sense-making, meaning-making, and subjectification – the *non-humanness* – she faces.

So – as Hottinger established – there is an exclusive subjectivity, one that is device for determining *how human* one is. When a person is degraded or violated, the violence is thus not necessarily an ascription of the status of ‘an object,’ but might also take the shape of a subjectivity or a subjectification that is simultaneously rendered exclusive. Cultural and literary theorist Saidiya Hartman examines *subjectivity* in a similar vein when writing on enslavement:

I argue that the barbarism of slavery did not express itself singularly in the condition of the slave as object but also in the forms of subjectivity and circumscribed humanity imputed to the enslaved. [...]

The enduring legacy of slavery was readily discernable in the travestied liberation, castigated agency, and blameworthiness of the free individual.

Saidiya V. Hartman, Scenes of Subjection, 5–7

Here Hartman establishes the notion of *the subject* as an integral aspect of enslavement as the restricted participation of enslaved people in *the human* is integral to their enslavement. *The human* is a *subjectivity* that is demanded while it is restricted through the *Mathematics-Rationality-Human* continuum and of thinking-being.

So, epistemic violence moves to create an exclusion from *the human* and as a shared denominator of different forms of violence. Epistemic as well as other forms of violence share the infliction of this exclusion from *the human* through interwoven layers of sense-making, meaning-making, and subjectification.

I will now further explore *Mathematics* as a form of epistemic violence in relation to other modes of violence by examining each of the previously established epistemically violent aspects of Mathematics in their own subchapter.

2.4 The Hegemony of Rationality

Epistemic Dimensions of Sexual Violence

This section further explicates how the notion of *epistemic certainty*, as established by *Mathematics*, is as a form of epistemic violence. In this endeavor, I establish how *Mathematics*, as an image of thinking-being, fashions notions of *Rationality* and *credibility*. These notions of *Rationality* and *credibility* are a) established through the notion of epistemic certainty authorized by Mathematics as an image of thinking-being and are b) built to discredit victim-survivors of sexual violence. This section will thus further establish *Mathematics* as a form of epistemic violence and showcase violence as a continuum by examining the relationship of sexual violence and the *Mathematics-Rationality-Human* continuum with regards to *Rationality* and *Credibility*.

In doing so, I do not aim to produce a comprehensive examination of the epistemic dimensions of sexual violence. Rather, I take up a case study of sexual violence as a in order to make the lifeworld and socio-political consequences of epistemically violent notions of *Rationality* and *Credibility* tangible. Furthermore, this case study serves as an initial exploration of the interconnectedness of forms of epistemic violence with other forms of violence. To do so, I first locate the question of *credibility* in the context of sexual violence and from there move on to *Mathematics*.

Testimonies of sexual assault, whether they take place in the media or in person, are accompanied by questions of *credibility*. This could recently be observed in the media in the accusations against the German band Rammstein²:

2 Content Note for descriptions of sexual violence:

The German band Rammstein, internationally known for many decades, faced various severe allegations of sexual assault in the summer of 2023. In particular, lead singer Till Lindemann has been reported by many women to have drugged and sexually abused

With every testimony from a woman, hundreds of questions, assessments and calls were raised around the issue of her *credibility*. Being *credible* usually exists as a demand that is as unspecific as it is persistent. Those affected must study this obscure criterion as they must decipher it and fulfill it. These attempts to fulfill credibility have different levels. They have an intrinsic level: a need to believe oneself, to trust one's own perception and naming – in short, to experience oneself as *credible*. There is also an extrinsic level: a need to be believed, to have one's own experience not denied but taken seriously, to react to it and act on it – in short, to be experienced as *credible*. Both of these levels are interwoven and can exist simultaneously or individually. Susan Brison, for example, describes how she did not experience any questioning of her story thanks to evidence that was perceived as unambiguous (Brison 2017). However, this does not spare her the ongoing struggle to take her own experience seriously and to perceive herself as *credible* and *rational* (Brison 2003, 2017). In the time after her rape, Brison experiences herself as outside of the *human* and outside of the *rational* (Brison 2003, ix). Her perception of what she has experienced and continues to experience after the crime seem to lie outside of what her life consisted of before. I assume that there is a close connection between the idea of *credibility* and that of *Rationality* as both concepts form norms that shape the experiences and expressions of victims.

When aspects of our expression or experience lie outside of the idea of *credibility*, it does not necessarily mean that an experience of violence is denied as such. This denial does take place, and it takes place to a specific extent in the context of sexual violence (Brison 2017). However, this direct denial is not the only way to consign people, modes of expression or worlds of experience to a supposed 'outside of credibility.' Exclusion from the idea of *credibility* can also take the form of conceptualizing certain aspects of one's own experience or expression as *implausible*. Brison, for example, experiences continual devaluations of her philosophical work on sexual violence in which *rape* is understood by her philosophical peers as a biographical element specific to her. This

them – the sexual abuse often being especially brutal and physically harmful and leading women to awake from a state of unconsciousness due to heavy bleeding.

When an increasing number of women came forth, many fans as well as a wider public denounced the accounts of the women who had come forth or would withdraw from the conversation by saying they would 'wait for proof.' Till Lindemann and Rammstein faced various forms of feminist resistance but ended up successfully touring that same summer as well as the summer after, in 2024.

is the only existence that is conceded to *rape*. It is explicitly not understood as a philosophically relevant topic. Instead, Brison is summoned by superiors and encouraged to turn her attention back to the "real questions of philosophy" following the completion of her personal coping with *Aftermath*. I also see a question of *credibility* in this experience of Brison as Brison is believed to have been raped but is not believed when she says that *rape* is a structural problem or that it is of philosophical relevance or that she knows how to assess this topic in all its dimensions. Even here, then, there is an exclusion from the idea of *credibility* that affects Brison specifically in her marginalization as a *raped woman*.

However, the question of *credibility* often also relates to the violence itself. People who report experiences of sexual violence often experience one of two reactions, or a mixture of both, in and out of court in which their naming of the violence is seen as an *exaggeration* or their story is not doubted, but they are denied the right to tell it, or they are accused of a conscious or unconscious form of lying, whereby the story as such is denied. Both of these strategies, as well as Brison's experience, which takes place in the context of the recognition of rape, reflect exclusions of *credibility*.

In her essay *Men explain things to me*, Rebeca Solnit writes about a conversation in which her professional expertise as an author is not acknowledged. She recounts and negotiates the experience and finds herself at the end of the essay in a description of court proceedings on sexual violence (Solnit 2019, 11). In an epilogue, she describes how she was initially surprised to have written about rape in her processing of this conversation. However, she quickly realized that the core theme of her essay is the question of *credibility* and that it is precisely this idea of *credibility* that connects the annoying party conversation with the courtroom as patriarchal criteria of *credibility* are produced and reproduced in both situations (Solnit 2019, 11). And, according to Solnit, *credibility* is ultimately a question of survival (Solnit 2019, 28 f.). This dimension of survival also has many dimensions. Survival can be about access to protection and resources or also about one's own survival – the attempt to feel *human* again after experiencing violence and to inhabit a lifeworld again that does not just feel *outside* of hegemonic norms.

The implicit and explicit demands for the *credibility* of modes of expression, ways of life, narratives, and names imply *credibility* as a form of superior authority and in doing so, implicitly or explicitly, refer to *rationality* as a concept, *Credibility* is assumed to be something that can be clearly assessed and can be fulfilled equally by all. In doing so, reflection on the fact that criteria of *credibil-*

ity are established and maintained by society and conceptually include socio-political exclusions is preempted.

The concept of *credibility*, I argue, is conceptually intertwined with the *rationality-emotionality-binarity* because *emotionality* serves as one of the most prominent criteria for *non-credibility*. Another criterion of credibility is lack of *contradiction*. Narratives that show *contradictions* or expressions that are understood as *emotional* serve as prominent criteria, in the context of testimonies about sexual violence as well as in other cases, for conceptual exclusion from the idea of *credibility*. In this sense, *rationality* appears implicitly in the demands for *credibility*. Both concepts, are conceptualized in their essence through their opposition to *emotion* and *contradiction* and thus order, organize, include and exclude (Jones 2002, Harding 2009, Shulman 1996, Nye 1990). Moreover, both concepts assume the possibility and desirability of a *neutral point of view* without subjecting the criterion of neutrality itself to scrutiny. In the search for *Rationality* and *credibility* lies a search for *unambiguity*, which I propose to look at by considering the concept of *proof* as a constitutive idea of *Rationality* and *credibility*. The demand for *proof* is also a prominent reaction to testimonies of sexual violence and as such it is similar to the ideas of *credibility* and *Rationality*, as it is also about realizing an ideal of *determinability*.

Such a concept of *proof* suggests a conceptual interweaving with *Mathematics* and pose the following questions: what conceptual connections exist between the concept of proof in *Mathematics* and that non-mathematical concept of proof that becomes effective, for example, in the media, personal and legal settings as well as in political disputes regarding sexual violence?

As an initial insight into these entanglements, let us first consider the rhetorical effect and political efficacy of the demand for evidence in response to testimonies of sexual violence. These demands for evidence are closely interwoven with two central narratives. The first is that there is a substantial probability that the narrative is untrue and thereby fundamental doubt is correct. Secondly, there is a possibility of *evidence* that actually creates *clarity* about the specific case and thus also about the fundamental use of the term sexual violence.

The first of these narratives is essentially rooted in patriarchal social structures. That incline us to believe as we grow up or have a preference with for seeing sexual violence as major exceptions, so-called isolated cases, or as something that is supposedly far removed from modern Western culture. This preference is personally, politically and epistemically relevant and it results in said fundamental doubt, especially in the light of empirical data that impressively

demonstrates the rarity of false statements (see e.g. Leithead 2021, Kay 2018, NSVRC 2012). The second narrative refers to the epistemic, political and personal need that the demand for evidence seeks to fulfill: a need for *unambiguity* and ‘seclusion of knowledge.’ This desire for unambiguous knowledge, according to my argument, exists for the respective case and also explicitly beyond it. The question of whether a testimony of sexual violence can be *proven* requires criteria (*criteria of proof*) about the *correctness* and *incorrectness* of the application of the term ‘sexual violence.’ If a specific narrative is classified as *proven* or *disproven* in the media, legally, or personally, this shapes a certain understanding of *sexual violence* as a whole.

The notion of *proof* demands *unambiguity*, *neutrality* and *closure*. Thus, assuming that sexual violence can be *proven* means assuming a *politically neutral* concept of *proof*, *sexual violence*, *sexuality* and *violence*. And it is this credo and this power-political search for a *neutral*, *universal* perspective that is reproduced in *Mathematics*. The concept of proof in *mathematics* forms a conceptual basis for non-mathematical concepts of proof, which are interwoven into the very same power-political search for interpretative sovereignty which *mathematics* exerts.

The concept of *Mathematical proof* secures the socio-political idea – the possibility, desirability and necessity of a closed, unambiguous, and universal knowledge. The *Mathematical proof* is implicit reference in non-mathematical concepts of *proof*, such as those used in the context of sexual violence³. I also see this conceptual interweaving of the idea of *Mathematical proof* in the concepts of *credibility* and *Rationality*; both of these terms cultivate an existence as epistemic ideals as well as rhetorical and political figures. The efficacy of rationality and credibility can only exist against the basic collective assumption that *total knowledge* (unambiguous, complete, and universal) can be produced by *humans* and that the production of such knowledge is desirable – even necessary. My core argument here is to point out that both of these basic premises are fundamentally secured by *Mathematics* as a concept. In this sense, *Rationality*, *credibility* and concepts of proof implicitly refer to *Mathematics* as they are committed to those ideals of knowledge and basic methodological ideas that *Mathematics* is considered to fulfill.

The notion or demand of *credibility* as faced by victim-survivors of sexual violence is a form of epistemic violence. It is a notion built on excluding those

3 This analysis evokes feminist discourse on evidence that cannot be recaptured here but is crucially shaped by the voices of Francis and Smith 2021, Childs and Ellison 2000, Bryden and Lengnick 1997 or Hunter 2000.

who have faced sexual violence and its survival. It does so by excluding those who are less-*human* or non-*human* according to the standards set by the continuum-based *human* – *the human* grounded in the *Mathematics-Rationality-Human* continuum. This epistemically violent notion of *credibility* restricts access to legal and social resources and further restricts one from being experienced as *human*. Resultingly, this exclusive notion of *credibility* is birthed by the exclusive *human* and further establishes the exclusive *human*: exclusive *credibility* partakes in the continuous making of the exclusive *human* i.e., the *Mathematics-centric human*.

I have established here that this exclusive *credibility* – *human credibility* is established through a *Mathematics-centric Rationality* and through the notion of *proving* birthed by *Mathematics* as an image of thinking-being. Both *credibility* and *Rationality* conceptually reference the *Mathematics-centric* notion of *proof* and are conceptually authorized by their interwovenness with the idea of *proof*. This conceptual interwovenness is especially explicit when victim-survivors of sexual violence are evoked to provide proof of what happened to them in order to be understood as *credible* in their accounts. However, this same interwovenness of *proof* with *credibility* and *Rationality* is prevalent in a multitude of ways. Victim-survivors live the ‘contradiction as falsity’ – logic in the context of sexual violence, as they are regularly attributed ‘contradiction’ or ‘contradictory behavior’ as a means of allegedly showing them as non-*credible*, non-*Rational* – and thus non-*human*. This figure of ‘contradiction as falsity’ is one of the instances showing how exclusive notions of *credibility* and *Rationality* are rooted in an axiomatic idea of *proof* as well as in *Mathematics*.

The world grounded in the *Mathematics-Rationality-Human* continuum births the axiomatic proof and exclusive credibility; both are symbols of the continuum-based metrics as well as actors in upholding the bodies of the *Mathematics-Rationality-Human* continuum and the epistemic violence of the continuum.

2.5 Struggles for Interpretative Sovereignty Necessity as Dominance

As I have established in my reconstruction of *Mathematics* in chapter one, the notion of *epistemic necessity*, of ‘necessarily true knowledge’ is established in a conceptually continuous relationship with *Mathematics* – more concretely – with the figure of *Mathematical necessity*. As Shulman and Stengers demon-

strate, the notion of 'epistemic certainty' built into the notion of *necessity* is a question of power because it is a question of epistemic authority, of interpretative sovereignty, and of narrative power. The notion of *necessity* is construed as a mode of thinking-being and a quality of specific forms of knowledge. The knowledge to which *necessity* is attributed is the knowledge that gains distinct epistemic authority. Thus, I explore the notion of *necessity* as a) being established through *Mathematics* and b) enfolding epistemic violence in the form of fashioning an interpretative sovereignty that limits and silences marginalized narratives, accounts, and thinking-beings. In each case of all four of my explorations of *Mathematics* as epistemic violence, I will draw from sexual violence as a case study.

I understand the epistemic control enacted through the notion of *necessity* as a form of epistemic violence in the sense that it is an attempt to control narratives and epistemes that move in accordance with the *Mathematics-Rationality-Human* continuum. As such, *Mathematics* is the image of thinking-being that births and is implied by those notions of necessity that foster epistemic control.

I will begin by examining the notions of epistemic control and dominance as forms of epistemic power. In my consideration of sexual violence, I highlighted demands for *proof* and *credibility*. These conceptions are as fundamental as they are inaccurate and are therein a tool for exercising epistemic dominance as they claim sole and total dominion over processes of naming, narrating, interpreting, signifying, and evaluating. Kate Manne describes forms of such control and dominance on an epistemic level as integral components of sexual violence, its normalization, and thematization. Manne characterizes the control over the naming and non-naming of an act as a patriarchal, male-dominated exercise of control that has an unsettling effect on sexual violence (Manne 2018, 4 f.). This uncertainty extends throughout the existence of sexual violence – in its systemic components as well as in very specific cases. According to Manne, the classic narrative of sexual and domestic violence is that it is a mistake or an escalation, but not *sexual violence* (Manne 2018, 7).

The implication here is that violence – especially patriarchal forms of violence – form a very specific, particular category of action, i.e., something that rarely or never occurs and that *cannot simply be asserted*. The paradox lies in the fact that concepts of *sexual violence* and *domestic violence* are placed outside the norm, while at the same time those very forms of violence are continually normalized and thus conceptualized precisely as the norm. The naming of violence is thus de-normalized while the violence itself is explicitly normalized. This

paradox is one that secures power in rendering even the act of naming *domestic violence* or *sexual violence* *implausible* in principle. This is due to the fact that according to prevailing conceptual networks, these forms of violence are *eternally different* – meaning they take place in *a different place*, in *a different time*, or take place at the hands of *other people* (Manne 2017, 34). This supposed demarcation also conceptualizes the apparent unambiguity of the term *sexual violence*.

Cases and issues of sexual and sexualized violence are thus understood in binary terms. It is sexual violence, or it is *not* sexual violence. The result is the appearance of unambiguity and binarity. This view makes it impossible to discuss what is considered as sexual violence, nor what is considered as the sexual norm or “abnormal.” Instead of a common process of interpretation and understanding, questions of sexual violence become a question of *being right and wrong*, which exists legally, politically, personally and epistemically as all these dimensions are closely interwoven and intrinsically related to each other.

My argument is that this way of looking at and treating sexual violence follows the axiomatic logic that Shulman describes and problematizes. This thematization represents a transfer of the axiomatic way of thinking to the topic of sexual violence as an epistemic system that distinguishes between *true* and *false* through the criterion of *contradiction* is imagined. The central epistemic ideal of the axiomatic method is *necessity* – the *inevitability* of knowledge. Interwoven with these ideals of *necessity* and *inescapability* are the concepts of *universalism* and *neutrality*.

At the core of all these ideas is what Shulman calls the desire for epistemic control – understood as being able to force someone to say or not to say something (Shulman 1996, Nye 1990). It is the desire for epistemic dominance in a very literal sense whereby one is able to control what is said and not said and how it is interpreted and not interpreted. The ideas of *necessity*, *inevitability*, *universalism*, and *neutrality* are to be understood in t as tools for exercising such epistemic control. They imagine and conceptualize that ‘epistemic univocity’ that must be assumed in order to enable, legitimize, normalize, and even affirm forms of epistemic control and dominance. The normalization of the search for and exercise of epistemic control is a central element of epistemic power protection as it enables invisibility of these dominating relations of power and thus a (largely) unhindered continuation of power and violence.

Mathematics serves as a central conceptual safeguard and source of legitimization of the practices that seek and have epistemic control. *Mathematics* exists implicitly as an image of thinking in all those epistemic practices that fundamentally serve the production of epistemic dominance. *Mathematics*

secures the idea of the possibility and desirability of epistemic control and produces an imaginary of legitimate epistemic control by creating methodological and epistemic ideals that supposedly legitimize the claim to epistemic dominance. The notion of legitimacy, even desirability, of epistemic dominance feeds ideas of *rationality/irrationality*, *credibility/incredibility* and their political and personal consequences as those narratives, persons or modes of expression that become legible as *irrationality* or *untrustworthiness* become objects of epistemic dominance and are themselves excluded from this form of control.

Mathematics as an image of thinking produces standards for the exercise of epistemic control as it legitimizes and affirms epistemic dominance as *scientific* or *progressive* (e.g. Pinker 2018). However, the good of epistemic control remains exclusive to existing power relations. *Mathematics* is Western and patriarchal in its core project of producing and affirming epistemic coercion, and it is Western and patriarchal as to whom these forms of exercising power accrue.

The particular normalization of epistemic control, which emanates from *Mathematics*, makes it a central player in processes of epistemic power and itself a carrier of epistemic violence. *Mathematics* exists as the ultimate conceptual safeguard in the production and reproduction of epistemic dominance. This safeguarding of interpretative sovereignty through epistemic dominance takes place in four dimensions: 1) *Mathematics* forms a point of reference for every other concept of proof; 2) *Mathematics* forms a point of reference and conceptualizes the legitimization of struggles for epistemic control; 3) *Mathematics* functions as a supposed *proof* of the possibility and desirability of a certain kind of truth, a *neutral* kind of knowledge; and 4) *Mathematics* provides a specific image of what *knowledge* should look like in order to be considered as such.

Mathematics as an image of thinking-being is part of endeavors of epistemic control as they come into existence through the notion of *necessity* birthed by *Mathematics*. This *Mathematical necessity*, as established in chapter one, is part of *the Rational* and *the Human* too; the knowledge derived through *necessity* is the knowledge construed as the most valuable knowledge of *human thinking* thus making *necessity* into a conceptual cornerstone for the *Mathematics-Rationality-Human* continuum.

2.6 The Logic of the Binary as Oppression

Epistemic Hegemony

I now examine the logic of *binary* that moves continually with the logic of *separability* and hierarchized dualisms. As established in chapter one, the understanding of *binary* conceptions and modalities of thinking based on binary conceptions, such as the practice of the ‘indirect proof’, are integral to *Mathematics*. The *Mathematics-Rationality-Human* continuum thrives off of and establishes binary modalities of thinking and a continuous infatuation with dualism whereby *Mathematics* as an image of thinking-being relies on and authorizes and produces binary modalities of thinking. *Rationality* comes into itself only through its construction as the opposite of *Emotionality*. And so too is *the Human*, made an allegedly closed category in opposition to notions such as *animal* or *nature*.

These inclinations to hierarchized dualism and to binary modalities of thinking are a form of epistemic violence that continue the exclusion from *the human* of every thinking-being in non-accordance with the *Mathematics-Rationality-Human* continuum.

I connect several existing decolonial and feminist problematizations of binarity and dualism situate *Mathematics* relation to these conceptions (e.g. Plumwood 1993A, B). I start with *thinking-in-binaries* – a concept that is characterized by two epistemic tendencies and ideals: a tendency to think within and through existing binary concepts (dualisms) –that is, to use them as one’s epistemic horizon; and a tendency to assume fundamental epistemic duality (*true* – *false*, *credible* – *untrustworthy*, etc.).

First, I characterize and problematize thinking-in-binaries on the basis of six aspects that I understand as constituting the epistemic stance of *Mathematics* and as intrinsically power-securing. Subsequently, I shed light on how *Mathematics*, as an image of thinking, secures these six power-securing effects of *thinking-in-binaries*. In doing so, I focus primarily on the specific role and relevance of *Mathematics* as a conceptual safeguard and legitimization of *thinking-in-binaries*. The conclusion of this chapter indicates the effects of *thinking-in-binaries* for processes of subjectivation.

Let us first look at *thinking-in-binaries* understood as a basic epistemic attitude that structurally permeates the socio-political life of the Western world. It can be found and is maintained for example, in and by institutions, interactions, individuals and media representations. *Thinking-in-binaries* is characterized by the fact that existing dualisms, such as the *rationality-emotionality*

dualism or the *nature-culture dualism*, function as an unquestioned epistemic basis and are while being reproduced by *thinking-in-binaries*. Moreover, *thinking-in-binaries* assumes, implicitly or explicitly, an epistemic duality – it assumes a fundamentally existing *true* or *false*, a *credible* or *untrustworthy*, or a *scientific* or *non-scientific*.

I propose that the following six aspects be noted as potential epistemically power-securing effects of *thinking-in-binaries*.

- 1) In establishing an epistemic duality (*true – false*), the conceptual basis for practices and attempts at epistemic dominance and control is constituted.
- 2) *Thinking-in-binaries* establishes the epistemic expectation of the *closedness* of *categories* as the norm. Bivalence thus becomes a fundamental norm a simplification of *thinking*-, and thereby the hegemonic immobility of concepts of violence are established and maintained.
- 3) *Thinking-in-binaries* favors and is based on the prediction of existing hierarchized dualisms, such as the *rationality-emotionality dualism* or the *nature-culture dualism*. In this way, central patriarchal and colonial conceptions are actively kept alive and maintained in their epistemic and socio-political relevance.
- 4) *Thinking-in-binaries* forms a central epistemic basis for hegemonic norm-setting and the forms of othering that result from it.
- 5) *Thinking-in-binaries* forms *objects* and *subjects*. It constitutes those who look and those who know as well as those who are looked at and known about. This is accompanied by forms of epistemic objectification, which reproduce these conceptual foundations and legitimize other forms of objectification.
- 6) *Thinking-in-binaries* shapes hegemonic modes and concepts of *credibility* that are informed by the stigmatization of *contradiction* and the denial of an *in-between*.

I will summarize each of these aspects as a dimension as epistemic violence. Firstly, the establishment of an epistemic duality, for example through a binary conception of *truth/falsity*, *lie/truth*, *credibility/incredibility*, already contains attempts to claim epistemic authority (Stengers 2000, 102 f.). It is precisely the binary character of these conceptions that enables what Shulman calls epistemic dominance i.e., *getting someone to say something*. Such a practice requires an epistemic binary as well as a way to claim the side established by such as *epistemically superior* (true, credible, proven, etc.). The establishment of an epistemic norm grounded in the value of binarity informs the epistemic frame-

work against the background of which a struggle for *epistemic winning and losing* is possible as it is what ensures that there is an epistemic sense of *winning and losing*. c. In this dimension, a fundamental establishment of epistemic bivalence as a norm is the central conceptual foundation upon which struggles for epistemic authority take place. Epistemic bivalence establishes the playing field on which ground practices of epistemic dominance and control can – even must – take place.

Secondly, the epistemic claim and the epistemic norm of the *seclusion of categories* bears a three-fold form of epistemic violence.

On the one hand, bivalence is elevated as a fundamental epistemic norm as the fundamental expectation of an *either/or is created*. This shapes epistemic practices as well as fundamental social images, for example of *gender* or *sexuality*. For, central basic structures of knowledge and coexistence, such as having two values becomes the norm: *either man or woman, either heterosexual or homosexual, either rational or emotional, either true or false, either ... or ...* This normalization and universalization of binarity marginalizes and unsettles equivalencies and spaces in between. It creates a compulsion to "choose a side." The epistemic safeguarding of power here is twofold. Firstly, identities and groups, which contest binarity are systematically made insecure, for example bisexual people through a binary understanding of *sexuality* and trans, intersex and non-binary people through a binary understanding of *gender*. Secondly, the *either/or* norm establishes a conceptual framework that makes the exercise of epistemic dominance possible in the first place. This is because practices of epistemic dominance require a conceptual network of bivalence – a *true* and a *false*, a *credible* and an *untrustworthy*, a *rational* and an *emotional*.

Thirdly, the idea of the *closure of categories* characterizes a fundamental tendency to think *in isolation*. If the closedness of *categories* represents the epistemic and social norm, then thinking in contextually becomes systematically more difficult. The norm of *closedness* reproduces the idea one should speak in terms of *individual cases* instead of systems and resultingly *individual closedness* emerges as a norm for thinking and political and personal interpretation. In accordance with this *habit of thinking in terms of closedness*, it is also more logical, for example, to assume the existence of *individual cases rather than systems at the root of violence*. Due to the established habit of *closure created by this norm, thinking in contexts* is decisively less obvious than *thinking in isolation*.

Fourthly, the expectation of seclusion serves as a structural shield against a *dense reality* of marginalized lifeworlds. Elsa Dorlin, in her book *Self-Defense*, (2020) describes an epistemic difference between the rulers and the oppressed.

According to Dorlin, the rulers have no *dense reality* other than their own and for them, there is no tangibility, no experience of not being *the norm* themselves. What Dorlin describes is impressively demonstrated in media and social discourses on *sexual violence* as in questions of *sexual violence*, definitions are used without being understood as contingent expressions of their socio-historical origins. The term *sexual violence* is flattened and becomes two-fold. *Either it exists or it does not exist*. This denies and refuses profound insights into these forms of violence and ongoing patriarchal and colonial understandings of the term are codified and, in a sense, naturalized. This dynamic, I argue, is fed by the fundamental expectation of the *closed nature of categories* in which epistemic and social norms lead to a suppression of interrogations of concepts and categorizations that are critical of power relations, such as *sexual violence*.

Fifthly, *thinking-in-binaries* gives authority to existing binary concepts (*dualisms*) and keeps them alive and meaningful. In Western structures of power, for example, dualisms exist that are inextricably linked to the production and reproduction of patriarchal, colonial, and racist power relations, such as the *rationality-emotionality dualism* or the *nature-culture dualism* (Plumwood 1993, 43). *Thinking-in-binaries*, as a fundamental, general, and collective habit of thinking and interpreting favors and maintains precisely such dualisms.

Sixthly, *thinking-in-binaries* is closely linked to othering and hegemonic norm-setting. The structure of thinking and practice of interpretation of *either/or* calls for thinking and interpreting within the framework of binary concepts. These binary concepts are usually hierarchized in so far as they are understood as either *superior* or *an inferior to each other*. This hierarchization is closely linked to a form of norm setting in which the *superior* points to what is considered as *normal* and the *inferior* as *deviant*. *Thinking-in-binaries* as a basic social and epistemic order calls for an understanding of the *self* and the *other* as distinct from one another and thereby favors those hegemonically shaped norms.

Seventhly, *thinking-in-binaries* forms a binary distinction between *objects* and *subjects on the basis of: an either-or structure, in which* there are those who *look* and *know* and those who are *looked at* and *known about*. This epistemic power relation ignites and is founded along existing power relations and produces and reproduces them (Haslanger 2002, 209 f.).

Eighthly, *thinking-in-binarity* produces and reproduces hegemonic concepts of *credibility* in two ways. First, collective, Western ideas of *credibility* stigmatize *contradiction* by understanding it as an indicator of untrustworthiness. This takes away crucial spaces of expression that are typical, for example,

for the expressions of traumatized people or negotiations of socio-politically complex cases of violence. Secondly, an in-between is denied by categorizing statements, narratives, and narrative styles as *credible* or *untrustworthy*. There is no room for *hearing* and *being heard* without these judgments.

I will now further examine how *Mathematics* as an image of thinking-being births and authorizes *thinking-in-binarities*. First, I consider each of the six aspects again in order to show separately how *mathematics* participates in establishing and securing the power of the specific aspects of thinking-in-binarities. I then go on to discuss the specific role and relevance of *Mathematics* for *thinking-in-binarities*.

To begin, *Mathematics* characterizes its methodological approach and justifies its special epistemic authority precisely by reference to epistemic bivalence as a criterion of the *certainty* of the knowledge produced. As such, the axiomatic method and the rules of deductive reasoning⁴ are based on and reproduce epistemic bivalence. Accordingly, the central epistemic ideal of *mathematics* lies in the production of *incontrovertible truths*. This fundamental ideal is fed by the idea of a *truth* and a *falsity* with nothing in between. Concrete proof is also based on this epistemic bivalence, in that the rule of the "excluded third" is used for proof. Moreover, *Mathematics* is also characterized by a specific attitude in relation to the epistemic norm of having two values as this norm it is both understood as inescapable and treated as the reason for the special epistemic authority of *mathematics* (Shulman 1996).

In this sense, epistemic bivalence is indispensably interwoven with the idea of producing *compelling truth*, which makes the epistemic structure at the core of the *either-or* compulsion possible in the first place.

Secondly, *mathematics* takes the *closedness of categories* as the norm in its understanding of axioms. An axiom should be a *truth that is compelling in itself* and as such the axiom should have an inner closedness, which is what renders it epistemically usable and utilizable in the sense of *mathematics* (Shulman 1996). The criterion of *closure* is thus the criterion for epistemic participation within the framework of *mathematics*. It is precisely this dynamic that is also transferred to socio-political processes as forms and performances of closure are

4 Deductive reasoning seeks to establish *necessarily true* statements by establishing statements (axioms) that count as *necessarily true* and to then derive further statements from these axioms in ways recognized as *logically necessary*. For more detailed accounts on deductive reasoning see Dutilh Novaes 2021, Shulman 1996, Nye 1990.

required from modes of expression, concepts, etc. in order to qualify for epistemic participation, (Shulman 1996).

Thirdly, the role of *mathematics* in the preservation of patriarchal and colonial dualisms is less direct, but no less influential. Dualisms are characterized by a) the construction of the absence of an *in-between* or *beyond* and b) by an implicit or explicit hierarchization between individual dualisms. *Mathematics* exhibits both of these criteria by organizing itself along the two dualisms of *true/false* and of *contradictory/free of contradiction*. This organization appears as a *normality*, and even, an *imperative normality* (Shulman 1996, Nye 1990). The fundamental structure to secure power of dualisms is thus produced, reproduced, normalized and authorized by *mathematics*.

Fourthly, the axioms of *mathematics* can be understood as a form of standardization. Axioms constitute *the incontrovertible*, *the unquestionable* and *the unquestionable* – they constitute *norms* (Shulman 1996, da Silva 2017, Hottinger 2017). In *Mathematics*, this norm-setting is inextricably interwoven with the figure and ideal of *necessity*. Axioms are allowed to take on the role of norm-setting because they are conceived as *necessarily existing*. This conceptual interweaving of *norm* and *necessity*, I argue, inscribes itself into socio-political relations. *Mathematics* produces, normalizes, and naturalizes this interweaving and thus creates and shapes lifeworlds and political realities.

Fifthly, the division into *objects* and *subjects* is inscribed in *Mathematics* itself, insofar as binarity is evident in the conceptual frameworks of *mathematical knowledge production*. *Mathematical concepts*, *formulas*, *equations*, and *questions* are often described, treated, and understood as "mathematical objects." In this imagery, *mathematicians* are the *subjects of mathematical knowledge*, and the *mathematical objects* are the objects to be known. It is this clear *subject-object division* that is a central component of the establishment of epistemic authority and the authorization of *Mathematics*, and it is this clear division that reinforces the *sense of certainty* that surrounds *mathematics*. As such, in the methodological logics of axiomatics as well as in that the fundamental epistemic bivalence manifests itself, in the concrete form of this *subject-object division*.

Sixthly, I have previously demonstrated that a figure of *credibility* exists in the Western worlds and that this *credibility works to secure power* along the lines of identification with *credibility* and *non-contradiction* and the refusal of an *in-between* or *beyond*. *Mathematics* establishes both of these criteria as central characteristics of *correct and reliable thinking* and in this sense plays a decisive role in the construction of this figure of *credibility*. Furthermore, in the axiomatic method, *contradiction* serves as a central indicator of *falsity* (Shulman

1996, Nye 1990) and it is precisely this conceptual proximity of *contradiction* and *falsity/credibility* that occurs in socio-political contexts and negotiations. The collapsing of the *in-between* or *beyond* arises from the fundamental epistemic bivalence of *Mathematics* as in its world there is a *truth* and a *falsity* and nothing that cannot be categorized by reference to one of these two terms.

Thinking-in-binarities, as well as other hegemonic modes of thinking and being, are socially established in many ways through many interwoven concepts. In this sense, I consider *mathematics* to be one of many "players", but also a "player" with specific and particularly serious relevance to the production and reproduction of hegemonic *thinking-in-binarities*. *Mathematics* establishes itself as a discipline and way of thinking that demonstrates the possibility and desirability of a *necessary truth*. *Mathematics* thus exists as a central and final safeguard for universalist claims and normalized, binary modes of thought as such.

For example, *Mathematics* as a modality of thinking permeates the basic structures of analytic philosophy and classical philosophical logic (Mangraviti 2023, Nye 1990): This interweaving suggests that *mathematics* can exist as an explicit or implicit reference in the constitution of other fields and ways of thinking. Similar entanglements can also be observed in socio-political and legal uses of the concept of *proof through reference* to the figure of *Mathematical proof* through implementation of its epistemic ideals and methodological modes of operation in contexts other than *Mathematics*.

Thinking-in-binarities assigns the roles of *being an object* and *being a subject* constituted by hegemonic power relations. This dynamic is to be understood as a form of epistemic safeguarding of power. Shaped by existing power structures and grown to maintain them, safeguarding has a further dimension of bringing about 'a crisis of subjectivity' – in which people are often only granted very limited access to prevailing ideas and practices of *subjectivity*⁵ in line with their marginalization. *Thinking-in-binarities* as a whole reproduces crisis-ridden subjectivity by creating epistemic, social and political worlds in which an understanding of oneself and others as a *subject* is dependent on how well one moves in accordance with the *Mathematics-Rationality-Human* continuum and its modalities for thinking-being.

5 In alignment with the work of Saidiya Hartman, my notion of *subjectivity* is interwoven the notion of *the human* and understood as a potential perpetrator of violence (Hartman 1997).

2.7 The Thinking-Being of Epistemic Violence

The *Mathematics-Rationality-Human* Continuum

This chapter has established that the *Mathematics-Rationality-Human* Continuum creates systems of meaning-making, sense-making, and subjectification that continuously reproduce the existence of the continuum. I understand these movements of the continuum as epistemic violence – as forms of violence that shape and limit thinking-being according to colonial-patriarchal relations of power.

There are three decisive findings in this chapter.

- 1) The *Mathematics-Rationality-Human* Continuum lies at the heart of epistemic violence as the continuum produces exclusive notions and practices of what it is *to think* and of what it is *to be human*. These exclusive notions of *thinking* and *being* are themselves a form of epistemic violence that begins at the level of notions – the level of the epistemic – and from there it permeates all other spheres, and it permeates and shapes thinking-being itself by fashioning images of thinking-being according to hegemonic standards.
- 2) There are four distinct and interwoven ways through which *Mathematics* enfold epistemic violence. All four aspects far exceed *Mathematics* but are fundamentally created, legitimated, and upheld through *Mathematics: Binarism, Universalism, Proving, epistemic Necessity*.
- 3) The epistemic violence of the *Mathematics-Rationality-Human* Continuum is at the core of its world. This claim follows in connecting the findings of chapter one and two. Chapter one showed the transhistorical existence of the continuum and chapter two showed its violence. Connecting these two findings establishes that the *Mathematics-Rationality-Human* Continuum is an endeavor of world-making because it moves transhistorically to shape and limit thinking-being.

In conclusion, this second chapter established the interwovenness of epistemic violence with other forms of violence and it established the crucial role that the *Mathematics-Rationality-Human* Continuum plays in continuously reproducing the continua of violence. If we want to make visible the many violences of the *Man-Math*-centric world, we need mathematical modes of disobedience and mathematical modes of resistance so that our revolutions, our re-makings of the world account for the role *Mathematics* played and plays in (re)creating the world as it is now in which the *Man-Math* centric version of the world is hege-

monic. Chapter three and chapter four will respond to how this critical knowledge can be used for mathematical re-makings.