1-2018

Mathematics education and the juggernaut of capitalism

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ABSTRACT: This article undertakes an ideological critique of mathematics education from a capitalist perspective. By replacing 'society' with 'education' and 'the figure of the Jew' with 'mathematics' in quotations from philosopher Slavoj Žižek, we characterize mathematics as the symptom of educational ideology. From such substitutions, we get statements like: *Education does not exist and Mathematics is its symptom*. In order to explore the kernel of truth in these statements, we introduce two concepts: *identity-quilted-speech*, to specify the so-called certainty of twentieth century mathematics (M20), and *qualified-labor-power*, to characterize the commodity that results from school production. Through the development of these concepts, we show how M20 actualizes Kant's radical ethics. We indicate the need to consider the mathematics classroom from the sociological perspective of *jouissance*. We present three instances of the inescapable production of meaning imposed on us by what we call the juggernaut of capitalist society. This inescapable production leaves us no apparent alternative but to either become a devotee of Capital or to follow the path of the Great Refusal: a re-signification of terrorism. Against this dead-end alternative, we suggest ways of decelerating the juggernaut, trying to curb it from within our classrooms.

Key words: Production of Meaning; Evaluation and Promotion; Qualified Labor Power; Ideology of Education; Capitalism and Terrorism.

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Introduction

By simply looking around, we can immediately recognize how Capital-driven technology determines our reality. We become more and more dependent on a generalized ritual where technology-loaded gadgets determine the meaning of everything we do. These gadgets become signifiers; we cannot use them without producing meaning. There is no 'breathing space' for ceasing to be meaningful.

For instance, while you are thinking whether you should insert a five-dollar bill into a vending machine to get a sandwich, you still do not exist for Capital. As soon as you press the button, you produce yourself as meaning: you are a consumer and, as such, you are expected to automatically behave according to certain laws. Even your way of walking is meaningful. Consumers have no breathing space; production of nonsense becomes unfeasible. Furthermore, even doing nothing may be meaningful, as the following paragraph indicates.

Imagine a vending machine equipped with a camera (or the like) that registers people standing in front of it, walking by, etc. In such a situation, even these "non-interactions" with the machine can be fraught with meaning. The machine could save information such as how many people passed by, how many stopped, for how many seconds people stopped in front of the machine, etc. Once in a while, the machine could change its color, its display of advertisement, or the like. This could then be used e.g. to search for patterns in the data in order to determine how much the machine needs to capture the person's attention to ensure that she will make a purchase. Standing in front of a vending machine without buying yields a surplus value that is yet to be explained. [2]

Lacan would say that the appearance of the subject in front of the machine is the first, or unary signifier that represents the subject to another signifier, in this case, to Capital. This second signifier produces the *aphanisis* of the subject, in this case her reduction to a consumer. "Hence the division of the subject – when the subject appears somewhere as meaning, he is manifested elsewhere as 'fading', as disappearance" (Lacan

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[2] This paragraph is a contribution of Hauke Straehler-Pohl.

1978, p. 218). Commenting on Descartes's *cogito, ergo sum*, Lacan stresses the mismatch between thinking and being: "I think where I am not, hence I am where I do not think" (Lacan 1966, p.277).

In one word, capitalism leaves no room for the old and trustworthy 'free will'. Our conclusion is that the impossibility of a nonsensical action produces the sensation that we are *acting out pre-established roles that are only fulfilled when we think that we have managed to avoid them*. All-pervading meaning nullifies us into *"shallow mechanical dolls"* (Butler et al. 2000, p.134) and life becomes a deep permanent certainty of *déjà vu*. At the end of his book with J. Butler and E. Laclau, Žižek indicates the alternative to this political capture of the subject at the most intimate level: "My point, of course, is that today's 'mad dance', the dynamic proliferation of multiple shifting identities, also awaits its resolution into a new form of Terror" (Butler et al. 2000, p. 326). We suggest that the resignification of Terrorism asked for by Žižek is the Great Refusal to the constraints resulting from all pervasive capitalist meaning.

We call such automatism of meaning the *juggernaut of capitalism* and consider it from the point of view of mathematics education. Through a parody of a text by Žižek, we suggest that mathematics is to school what the 'figure of the Jew' is to society, namely, a *symptom* of failure. Mathematics' and 'the figure of the Jew' enter this parody as *rigid designators*, that is, meaningless signifiers whose function is to assign unity to ideological fields. To surpass the theoretical deficiency of the rigid designator, we make precise what we understand by 'mathematics': a historical form of speech that we call *twentieth century mathematics* (M20) and that we show to be a *metaphysical language convention*. This is the speech that we are expected to teach in our classrooms; we should be aware of its consequences.

We present three situations where the juggernaut of capitalism *fait ravage* among people's expectation of carrying out free will actions. We argue that the capitalist production of meaning in schools rests upon a resilient Borromean knot uniting three main school practices: teaching of M20, the credit system and economic qualification of labor-power. To oppose this capitalist production of meaning we suggest three possible actions that we can carry out from inside our classrooms, each of them founded on cutting one of the Borromean knot connections. Of course, global consequences can only

become effective through a large political educational movement that collimates the infinitesimal effect produced by each of us. Nevertheless, even if such movement never occurs, our ethical action may exempt us from the dead-end choice between capitalism and terrorism.

Educational ideology, mathematical symptom and mathematics education fantasy

We take for granted Althusser's description of the ideology of current education and the massive presence of mathematics education in schools. Although they do not say it, Lundin & Christensen (2017) and Straehler-Pohl (2017) show that *mathematics is a symptom of current educational ideology*. Indeed, by suggesting that imaginary gadgets used in socially significant problems have built-in or "frozen" mathematical properties, Straehler-Pohl (2017) brings mathematics to the center of meaning production in school. However, social relations perceived as properties of things is what Marx indicates as the phantasm of commodity and Lacan calls a *symptom*. We thus infer that *mathematics is a symptom of the current ideology of education*.

Furthermore, Straehler-Pohl (2017) proposes to legitimize a space for students within the mathematics classroom and to reject the demand to solve problems of social significance by means of mathematics. Lundin and Christensen (2017) focus on the ambivalent attachment to mathematics, where people learn to love and hate it simultaneously. From this, we infer that mathematics emerges as the symptom of *affectivity* that hampers school functioning. By showing us this limit point, these authors accomplish an important delineation of the jouissance[3] *kernel of educational ideology*, allowing us to develop this study.

In order to analyze this symptom we will employ an unorthodox method: we make a parody, copying a text of Žižek and replacing some signifiers. We propose an exercise: make the substitutions and read the parody. The substitutions are not arbitrary, but their adequacy can only be justified *a posteriori*. Our purpose is to suggest that

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[3] The French term *jouissance* transcends the English 'enjoyment' insofar as it contains sexual connotations and opens up the possibility of sadistic 'enjoyment'.

mathematics is to the failure of education just as 'the figure of the Jew' is to the failure of the totalitarian project of reaching a 'harmonious society', exempt from class antagonism. Perhaps a common unconscious drive is present in both situations.

Here is an example where we have made what will be our two main replacements: 'society' with 'education' and 'the figure of the Jew' with 'mathematics'. Where Žižek writes: "To put it bluntly: 'Society doesn't exist and the Jew is its symptom'" (Žižek 1999, p. 125), we make: "To put it bluntly: Education doesn't exist and Mathematics is its symptom". The development of the preceding paragraph leads us to substitute 'anti-Semitism' by 'anti-mathematics', a radical proposal to solve the dilemma 'love school, hate mathematics' (Lundin 2011). After each piece of parody, we will reproduce Žižek's original text in a footnote. We will distinguish the parodies using a different (Calibri light) font. From page 125 mentioned above we make:

> On the level of discourse analysis, it is not difficult to articulate the network of symbolic overdetermination invested in Mathematics. First, there is displacement: the basic trick of anti-mathematics is to displace educational differentiation into differentiation between the sound educational texture, educational body, and Mathematics as the force corroding it, the force of disruption. Thus, it is not education itself which is 'impossible', based on differentiation – the source of disruption is located in a particular entity, Mathematics.[4]

To show how this displacement is possible, Žižek enumerates a series of deleterious associations with the figure of the Jew. It is not difficult to find similar associations with mathematics. Mathematics is supposed to be difficult, to be not for all, class distinguishing, anguish producing, useless for real life, an ordeal for children and youths, etc. The substitutions that we have made in the next paragraph will be justified

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[4] On the level of discourse analysis, it is not difficult to articulate the network of symbolic overdetermination invested in the figure of the Jew. First, there is displacement: the basic trick of anti-Semitism is to displace social antagonism into antagonism between the sound social texture, social body, and the Jew as the force corroding it, the force of corruption. Thus, it is not society itself which is 'impossible', based on antagonism – the source of corruption is located in a particular entity, the Jew. (Žižek 1999:125).

below, when we deal with school and economy. From page 123, always of the same Žižek's text, we get the following.

> This displacement is made possible by the association of Mathematics with economic value. The source of failure and of competition is located not in the basic relation between students and the credit system but between the 'productive' forces ('good' students, teachers and staff) and slower learners, cheaters and profiteers that exploit the 'productive' classes replacing organic cooperation with competition.[5]

The ideology of education does not 'see' that the credit system imposes differentiation; it keeps the hope to teach all and attributes failure to external contingent factors.

> This displacement is, of course, supported by condensation: mathematics condenses opposing features, features associated with failure and success: mathematics is supposed to be for all *and* distinguishing, useless *and* empowering, excluding *and* promoting. [6]

Up to this point, the analysis of ideology has remained in the level of discourse. According to Žižek, essays on Althusser's theory of ideology have limited themselves to the level of the Imaginary and the Symbolic, forgetting the Real of *jouissance*. Continuing with Žižek's text, we complete the analysis of educational ideology in the realm of enjoyment. In page 126, we replace 'fantasy' with 'mathematics education' and 'sexual relation' with 'mathematics for all' to get:

> But this logic of metaphoric-metonymic displacement is not sufficient to explain how Mathematics captures our desire: to penetrate its fascinating force, we must take into account the way 'Mathematics' enters the framework of fantasy structuring our enjoyment. Mathematics education is basically a scenario filling out the empty space of a

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[5] This displacement is made possible by the association of Jews with financial dealings: the source of exploitation and of class antagonism is located not in the basic relation between working and ruling classes but between the 'productive' forces (workers, organizers of production…) and the merchants who exploit the 'productive' classes, replacing organic cooperation with class struggle (Žižek 1999, p. 125).

[6] This displacement is, of course, supported by condensation: the figure of the Jew condenses opposing features, features associated with lower and upper classes: Jews are supposed to be dirty *and* intellectual, voluptuous *and* impotent, and so on (Žižek 1999, p. 125-6).

fundamental impossibility, a screen masking a void. 'There is no mathematics for all' and this impossibility is filled out by the fascinating fantasy-scenario – that is why mathematics education is, in the last resort, always a fantasy of the mathematics for all, a staging of it.[7]

Surprisingly, this last paragraph is almost a rephrasing of contentions expressed in the articles of Pais (2012, 2014, 2017). Still from page 126, we get the following.

It is now clear how we can use this notion of mathematics education in the domain of education proper: here also there is no class relationship, education is always traversed by a differential split which cannot be integrated into symbolic order. And the stake of education-ideological fantasy is to construct a vision of education which *does* exist, an education which is not split by a differential division, an education in which the relation between its parts is organic, complementary.[8]

In this second part of the analysis, Žižek seeks to demonstrate how *jouissance* captures us, but he falls short. Our parody will help. 'School' enters here as a replacement for 'factual society'. From page 126:

How then do we take account of the distance between this corporatist vision and school, split by differential competition? The answer is, of course, Mathematics: an external element, a foreign body introducing disruption into the sound educational fabric. In short, 'Mathematics' is a fetish which simultaneously denies and embodies the structural

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[7] But this logic of metaphoric-metonymic displacement is not sufficient to explain how the figure of the Jew captures our desire: to penetrate its fascinating force, we must take into account the way "Jew' enters the framework of fantasy that structures our enjoyment. Fantasy is basically a scenario filling out the empty space of a fundamental impossibility, a screen masking a void. 'There is no sexual relationship', and this impossibility is filled out by the fascinating fantasy-scenario – that is why fantasy is, in the last resort, always a fantasy of the sexual relationship, a staging of it (Žižek 1999, p. 126).

[8] It is now clear how we can use this notion of fantasy in the domain of ideology proper: here also 'there is no class relationship', society is always traversed by an antagonistic split which cannot be integrated into symbolic order. And the stake of social-ideological fantasy is to construct a vision of a society that *does* exist, a society which is not split by an antagonistic division, a society in which the relation between its parts is organic, complementary (Žižek 1999, p. 126).

impossibility of Education. It is as if in Mathematics, this impossibility had acquired a positive, palpable existence.[9]

Here Žižek does not show how *jouissance* emerges. In our parody, *jouissance* emerges in the field of educational ideology insofar as some people identify themselves with the symptom: they strive to learn mathematics and some become mathematicians; they enjoy imposing a special kind of speech; as teachers, they appreciate those who can repeat this speech, they enjoy reproducing their own caste; they enjoy imposing hardship on young people, etc. However, we show that the disaffection towards mathematics, felt as a 'burden' or 'hardship', is due to the action of people immersed in the social contradictions of education, not to an intrinsic property of mathematics 'frozen' in gadgets.

Our parody has a counterpart in the wider social range. Even in societies not necessarily subjected to anti-Semitic ideology, a form of *jouissance* emerges when some people unconsciously identify with the 'figure of the Jew'. They actually do, in their everyday lives, most of what they execrate in the negative stereotype of this figure, which Charles Dickens described well in *Oliver Twist*; they only cover it up with a discrete bourgeois charm[10]. These people abide by un-confessable capitalist values. Only now can we conclude with Žižek: "the positive palpable existence of the 'figure of the Jew' (mathematics) marks the eruption of enjoyment (*jouissance*) in the social (educational) field" (126).

Up to this point, we have completed the interplay between two signifiers: 'education' and 'mathematics'. Our parodies indicate directions of research. Nevertheless, according to Žižek, to complete the analysis of ideology we must also establish the *meaning of the symptom*: In short, it can easily be shown how Mathematics

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[9] How then do we take account of the distance between this corporatist vision and the factual society split by antagonistic struggles? The answer is, of course, the Jew: an external element, a foreign body introducing corruption into the sound social fabric. In short, 'Jew' is a fetish that simultaneously denies and embodies the structural impossibility of 'Society': it is as if in the figure of the Jew, this impossibility had acquired a positive, palpable existence (Žižek 1999, p. 126).

[10] Consider, for instance, the great juridical operations, *Mani Pulite* (Clean Hands) in Italy (1992-96) and *Lava Jato* (Car Wash) that started in 2014 in Brazil and is still underway.

is a symptom in the sense of a coded message, a cypher, a disfigured representation of educational differentiation; by undoing this work of displacement/condensation, we can determine its meaning.[11]

Fantasy is not to be interpreted, only traversed, to find out that there is nothing behind it except pulsating drive. On the contrary, for the analysis of ideology, Žižek requires the interpretation of the symptom, the determination of its meaning. "There is a lot behind a symptom, a whole network of symbolic overdetermination, which is why the symptom involves its interpretation" (Žižek 1999, p. 126). Therefore, it becomes necessary to surpass the level of rigid designators and specify what should 'mathematics' as the signifier of a symptom mean in the context of mathematics education.

Meaning of mathematics as symptom of education: M20

Taking the signifier 'mathematics' as it appears in mathematics education texts, we see that its meaning is undefined. The only consensus around the question 'what is mathematics?' seems to be that whatever the answer may be, it hampers neither teaching, nor research on mathematics education, much less production of mathematics itself. For a comprehensive treatment of this question, see Gold (2016).

'Mathematics' as a common sense signifier is what Žižek (1999) calls a *rigid designator*; it is not a point of "supreme density of meaning"; on the contrary, it "totalizes an ideology by bringing to a halt the metonymic slide of its signified" (99). It is astonishing that such a huge market has been developed, flourishes and nourishes scientific ambitions around an undefined object of study whose meaning coincides with the act of enunciating its name. The result is a realm of discourse sharply contrasting with the absolute certainty attributed to its so-called results. Under the ideology of improvement, people "eschew research from a critical analysis of its own role in the creation of the very same gap that it so eagerly strives to close" (Pais 2017, p. 54).

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[11] In short, it can easily be shown that the figure of the Jew is a symptom in the sense of a coded message, a cypher, a disfigured representation of social antagonism; by undoing this work of displacement/condensation, we can determine its meaning (Žižek 1999, p. 125-6).

We understand M20 as the result of the millenary effort to introduce the possibility of *quilting points* throughout speeches in order to detain the sliding of the signified under the signifier. Quilting point is a concept introduced by Lacan, evoking the making of mattresses: the quilting point (*point de capiton*) is the stitch that transforms a sack into a cushion, with two sides, say, 1 and 2.

> You find this quilting point in the diachronic function of the phrase insofar as it (the phrase) only fastens its signification with its last term, each term being anticipated in the construction of the others and inversely, sealing their meaning by its retroactive effect (Lacan 1971, p. 165, our translation).

Let us give an example of 'certainty' in M20 to clarify what we are saying. In a calculus class for engineering students, the statement: 'a car with zero speed stands still' is a self-evident truth. These meanings belong to side 1 of the cushion, where the polysemy resides. However, M20 does not aim at this kind of certainty, neither is it the certainty that we are expected to teach at all school levels. Instead, M20 states that 'a function with zero derivative is constant' and proves it by a theorem. Through definitions, M20 assigns new meanings to familiar signifiers like 'continuous'. Definitions are the stitches that lead from side 1 to side 2, opening a completely new universe of meaning.

Once we pass through the quilting point of one of these signifiers, all the others acquire the interconnected meanings they have on side 2 and the corresponding signifiers of side 1 are reduced to metonyms of those of side 2. Side 2 is the side of M20. The quilting point does not come necessarily at the end of the sentence. The first reading of the theorem may make no sense and a second reading may provide *quilting at any point*. This diachronic operation has the retroactive effect of leading people to think that, in M20, meaning is a synchronic function established beforehand. Mathematicians communicate through these metonyms of side 1; they look like they are talking about our familiar objects, but they know that their meaning is on side 2. When two of them discuss a joint work in front of a white-board and, at a certain moment, one of them hesitates and

says: 'I see what you mean…', at this moment a signifier is being pulled from side 1 onto side 2[12]. Teaching M20 is teaching this double form of speech.

Since Cauchy, definitions have a special form: 'one says that' (*on dit que*). This '*on dit que*' was a major turning point in the development of quilting speeches. It allowed mathematics to become free from the obligation of describing the world. The ontology ceased to be *a priori*; it must be developed from *constitutive definitions*. Through this *convention of language*, mathematics surpassed the criticism of Berkeley[13] and became autonomous. Here we are at the ground level of the so-called exclusion by mathematics: if you do not abide by such language conventions, you are out, no matter how much you 'spin and burn' (Lundin & Christensen 2017) in your study hours.

A convention of language (*on dit que*) postulates the identity of two meanings: *on dit que A* is *A*, both *meanings* are the same; the meaning of one sentence on side 1 is identical to the meaning of the other on side 2: *A=A*. We say that this is a speech quilted via identity of meanings, an *identity-quilted-speech*. This is what 'rigor' means in reference to M20. If we look for the proof of the mentioned theorem in a calculus manual, we are driven back repeatedly, until the author evokes knowledge outside the scope of the book; we have to believe it. In mathematics education, the whole attempt of M20 to establish a higher degree of certainty about daily life ends in faith.

In addition to the language convention introduced by Cauchy, a second crucial point has determined the present level of certainty. M20 established its ultimate ontology when the objects it deals with were finally reduced to natural numbers. In 1924, Bertrand Russell said something like: *on dit que* a real number is a half-line of rational numbers (Boyer 1949, p. 293). However, M20 does not tell us what whole numbers are; it only establishes their minimal properties, the so-called 'axioms of Peano'. For M20, 'number' is nothing more than a rigid designator. Hilbert proposed to search for the ultimate quilting point, the ground level of all certainty. However, in 1935 Gödel showed that this

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[12] Collapse of the wave function in quantum mechanics terminology.
[13] Bishop George Berkeley (1685-1753) was a philosopher who fiercely criticized the lack of foundation of Newton's and Leibniz's infinitesimal calculus as having less solid ground than faith.

is not possible, because the paradox of the liar can be stated within arithmetic, i.e. in terms of whole numbers. Arithmetic itself is not free from paradoxes. Our conclusion is that M20 is *metaphysics based on language conventions*.

Higher qualified-labor-power visits publishers

In one way or another, the entire mathematics education movement expects us to improve the teaching of such language conventions while working under conditions imposed by capitalism. From an economic point of view, it is not difficult to understand that schools produce *qualified-labor-power*, a commodity that circulates as any other, has a market price, etc. (Baldino & Cabral 2013). Part of this production returns to school as the work power of teachers and staff. However, any commodity requires adequate measures from its owners in order to preserve or increase its value. If a commodity drops out of the circulation of Capital, it loses its value. Qualified-labor-power does not escape this fate. It constrains its owners to care for a well-appreciated professional or academic career. Lundin and Christensen (2017) provide us with an opportunity to discuss this issue:

> Consider the norms of research. They say that you should write and publish; they specify the form of your writing and often even what you should write about. Our shield, in this case, might consist of a steady stream of formally impeccable academic achievements, demonstrating that we are in fact objectively speaking, doing proper research. (…) Under this formal surface, however, we may very well think more freely than the publications suggest (24).

In other places, these authors seem to suggest that, since the ideological interpellation is never complete, we can somehow evade it: "We can disagree with norms as we please insofar as this does not disturb our 'show' of adherence. Acting as if putting up a shield of superficial practical compliance can be called norm evading" (ibid., 25). Also in Straehler-Pohl (2017) we find indications that the ideological interpellation would leave a door open to refusal: "In order to work effectively, ideology even requires people not to believe in the social fantasies they are performing" (48). However, Žižek has thoroughly challenged such hope for freedom.

> This apparent failure of interpellation, its self-relating disavowal – the fact that I, the subject, experience the innermost kernel of my being as something which is not 'merely

that' (the materiality of rituals and apparatuses) is *the ultimate proof* of its success; of the fact that the 'effect-of-subject' really took place (Butler et al., 134, original emphasis).

Following Žižek, hopes of freedom indicate the completion of an 'effect-of-subject'. We have an example of the nature of the ideological interpellation that produces this effect whenever an author visits an editor. We took the above quotation from a commodity that, like any book, has received investment from a publishing house. The circulation of the book-commodity in the market must at least preserve the value of the authors' qualified-labor-power, as well as the reputation and economic maintenance of the publishing house, its make value.

Of course no editor would say 'I need your paper to make profit' and no author would say 'I must publish to increase the value of my labor power'. If the editor and the authors consciously and publicly assumed this speech they would be playing the role of Brechtian characters in real life: quite impossible. Our argument presupposes that, in face of the mention that their contract involves these economic values, authors and publisher would protest, perhaps in Žižek's terms: 'we are not merely that'.

Of course, they cannot be 'merely that'; the "crucial dimension of the ideological *effet-sujet*" is "not in my direct identification with the symbolic mandate (such direct identification is potentially psychotic; it turns me into a 'shallow mechanical doll', not into a 'living person')" (Butler et al. 2000, 134). The *effet-sujet* is the feeling that I am an autonomous Ego (Lacan 1991, p. 83) that pre-exists the process of interpellation and can freely decide when to obey it. Therefore, when authors and editors say 'we are not merely that', they find a 'breathing space' that allows each one to "identify his own lack with the lack in the Other" (Žižek 1999, p. 122). Capital smiles, satisfied: its conditions for reproduction have been reproduced.

Here we must quote Sohn-Rethel (1978). "A capitalist enterprise may survive a lowering of its profits and even a temporary lack of profits in a general slump, but if the automatism of the labor process breaks down, the very basis of the production relation of capitalism is in jeopardy" (122). The necessity to maintain the process of production in operation is what Sohn-Rethel calls the 'postulate of automatism': "a condition for the Capital control over production is even more vital than its economic profitability" (ibid). We apply this postulate to mathematics education. The attempts to improve mathematics

teaching are precisely the excess of order that allows the proliferation of disorder-sustaining production: "publishing, teaching, funding and researching (to conferences, project meetings and the like)" (Straehler-Pohl et al. 2017, p. 3). In short, production in mathematics education becomes more important than the quality of its product.

The question that remains is not why and how capitalism transforms its criticism into profit and success as it did to Pink Floyd (1979), an exemplary case. The question is: *can an effective criticism of capitalism circulate as a commodity?* This is a side question of the present essay. We will return to it in the last paragraph of this article, following the suggestion of a colleague[14], and apply our criticism to ourselves.

Jouissance and Kant's radical ethics

"How is it possible to reduce or eliminate all the pathological motives or incentives of our actions?" (Zupančič 2000, p. 15). Of course this is a rhetorical question; nevertheless, the school system apparently endeavors to answer it. When grading an exam, mathematics teachers are supposed to "disregard all self-interest, ignore the 'pleasure principle' and all concern with her own well-being" (ibid). They should concentrate on the written document produced by the student, under the point of view of language convention defined by M20. Is this possible? "What kind of a monstrous, 'inhuman' subject does Kantian ethics presuppose?"(ibid). Lacan warns us that what is foreclosed from the symbolic emerges as symptom in the Real. Let us see how this happens.

Why do we make children 'spin and burn' (Lundin & Christensen 2017) in the mathematics classroom to impose a kind of certainty that either depends on faith or runs into paradoxes? The answer is that *M20 provides us with a disclaimer that assures the smooth functioning of the credit system*. As mathematics teachers, we are supposed to assume that certainty of M20 is reliable in all cases, like a Kantian "categorical imperative" (Zupančič 2000, p. 60) and that the social function of institutionalized schooling is the "legitimate distribution of pupils to future professions" (Gellert 2017, p.

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[14] Hauke Sraehler-Pohl.

76). In short, we enter our classrooms under the interpellation of *legitimate allocation grounded on absolute certainty*.

We can deceive ourselves believing that the promotion called 'evaluation' is a ready-made duty established before our arrival in the situation so that we can act without assuming any responsibility for it. This position is untenable; as mathematics teachers, we made a choice for this kind of duty somewhere in the past, informed by our participation in the process from our past role as students. Even when duty is inscribed in tables like the Ten Commandments, "it is the subject who makes something his duty, and has to answer for it" (Zupančič 2000, p. 59).

The credit system assures that we cannot promote some without creating hurdles for others; we cannot love promotion and hate exclusion. We derive our surplus *jouissance from the selective process* itself and not only from promotion, which means that *part of our jouissance comes from exclusion*. We can apply the disclaimer, which Zupančič (2000) calls our first self-deception and say "I am sorry if my action hurts you, but I only did what the Other (or Duty or the Law) wanted me to do, so go and talk to It if you have any objections" (58). However, we remain responsible by what we refer to as duty and, worse than that, "the type of discourse where I use my duty as an excuse for my actions is perverse in the strictest sense" (ibid).

This is not overly disquieting; perversion may well be an option when the smooth functioning of the school apparatus is at stake. Of course, the students may also enjoy participating in defense of the school: for them the process reserves the option of a masochist *jouissance*. However, the mathematics teachers rely on a second self-deception disclaimer. Suppose we ask teachers and staff precisely where the so-called 'exclusion' is occurring in their school, "They would point to the high number of students in front of them, they would point to the lack of qualified support and they would point to the social background of many of the students" (Gellert 2017, p. 78). Of course, mathematics teachers will never point to the certainty of M20 as a categorical imperative that "can be written in some master list of commandments valid for all future generations" (Zupančič, 2000, p. 60). Therefore, they deceive themselves regarding the part of our *jouissance* that comes from exclusion.

It is not 'mathematics' itself that imposes 'ordeal on children and youths' (Lundin & Christensen 2017). Failure does not have to be materially present; it suffices to keep it lurking on the horizon. The ordeal has to do with the feeling of lagging behind peers who are 'good in math' and the feeling of supporting a bit of their sadistic *jouissance*, suggesting that we are a hopeless mathematical case. When the credit system uses M20 as a "gatekeeping dispositive" (Boistrup 2017) the school affords the student the possibility of a kind of masochist *jouissance*. Of course, students respond differently to this affordance. Some love it, most hate it. Some may identify themselves with the symptom of educational ideology and enjoy the exercise of power sanctioned by M20 to justify the capture of work of those who 'fail', or, according to the euphemism, to justify the school's 'allocation' function of students to lesser professions as a legitimate one.

With stalwart resilience, the school sets the stage to keep this sadistic/masochist kind of *jouissance* as a possibility in the production of qualified-labor-power. We suggest research be done in the mathematics classroom from the perspective of *jouissance*, amounting to what we could call the *sociology of mathematics jouissance*. Werner Heisenberg (1971) and Hermann Hesse (1943) both tell us the stories of an idyllic time when the use-value of qualified-labor-power was paramount with respect to its institutionalized exchange-value. At that time, it mattered less what degrees one had than what one knew and could do. Discovery dominated the *jouissance* of researchers. Carl Djerassi (1963) tells us what happened to this *jouissance* since qualified-labor-power started being produced for the sake of the market: the possibility of prizes like the Nobel Prize started dominating the scene. These authors deliciously describe how ethics becomes a "*jouissance* of duty" with simultaneous production of subject and universality. In several points of their description, reality and fantasy coalesce.

Nevertheless, Borovik (2016) reports a personal case of a very different situation where the market of qualified-labor-power was absent in the old Soviet Union. He was free to create and grow. Asimov (1957) only exaggerates a little, depicting a fully planned society where the state took up the selection of people for different professions, including the distinction of people with high creative abilities who were not assigned to any profession and were free to do whatever they wanted, while supported by the state.

In Baldino and Cabral (2013) we made an exercise in Marxist rigor and looked at school from the economic point of view. For a similar exercise in rigor, see Pais (2016). Other authors, like Swanson (2017) also consider schools from this point of view and recognize that "certificates do potentially influence the future exchange rate of the commodity labor power for those holding them" (236). From an economic viewpoint, Neander (1974) reports the development of school in Germany from the Middle Ages to the sputnik shock.

We can now increment our 2013 (Baldino & Cabral 2013) answer to this question posed by Althusser. "Why is the educational apparatus in fact the dominant Ideological State Apparatus (ISA) in capitalist social formations, and how does it function?" (Althusser 1970, p. 93). The educational apparatus becomes the dominant one in capitalist society because in school, the student learns, above all, to participate in *and enjoy* the conditions of production and seizure of surplus-value, the work done by one's fellow classmates. Through the experience of mathematics '*jouissance*', school sets up the production of the capitalist dominant male. The association of M20 with the credit system allows capitalism to accomplish "the 'ethical transubstantiation' required by Kant's view: the question of the possibility of converting a mere form into a material efficacious drive" Zupančič (2000, p. 15). In other words, *school transubstantiates allocation grounded on absolute M20 certainty into* ' jouissance' *from fulfillment of the economic law*. It is hard to think of a more important condition that the juggernaut would require be imparted on the devotees of capitalism.

The Borromean knot

Articulation of school practices grants the smooth driving of the juggernaut towards production of meaning. Teaching of M20, credit system selection and production of qualified-labor-power are tied together by a kind of Borromean knot in such a way that attempts to isolate the contribution of any of these practices to the production of meaning are immediately nullified by conductors of the juggernaut. For instance, Pais (2012) denounces the production of meaning in these three practices, without enlacing them with the knot. Therefore, Gellert (2017) is free to slide the signified under the signifiers: the 'credit system' becomes a legitimate allocation function of school, 'M20 is not for all'

becomes various "mathematical knowledge to be transmitted to different groups of students" (69) and economical selection becomes access to socially powerful positions. Thereby, the criticism contained in Pais' aphorism is finally tamed and pulled back into order, and the juggernaut proceeds smoothly. The resilience of the Borromean knot is due to its connections, not to the inertia of its separate elements.

We state the Borromean knot in an aphorism whose terms require each other to have meaning: *M20 is not for all because the credit system obstructs* 'jouissance' *by applying M20 criteria*. Keeping this aphorism in mind, we draw the following diagram.
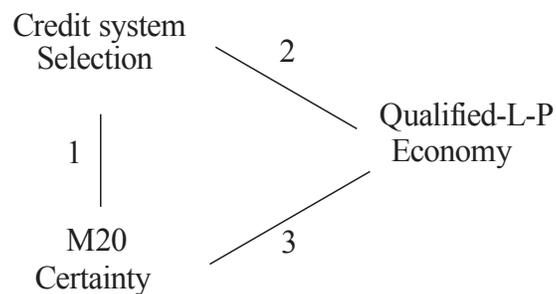

Figure 1. The Borromean knot

Connection 1: School standardizes the qualified labor power into strata and determines the M20 exchange-value of each strata. The economic value of the qualified-labor-power produced assures individual interest on the stability of this process.

Connection 2: The credit system distinguishes (allocates) people into professions of different salaries, producing qualified-labor-power of different values. M20 assures that this distinction is based on reliable and precise measure of acquired knowledge.

Connection 3: M20 is an ability to be imparted upon people in order to distinguish them according to the use-value of their qualified labor power. The credit system assures that this assignment empowers each one according to his/her capability.

If capitalism is indeed a juggernaut that deprives people of any possible alternative other than the Great Refusal, perhaps we can find a way to stop it by more efficient means than exploding ourselves and taking together as many as we can with us. There is no exteriority to capitalism to provide us with a fulcrum on which to apply a lever of change. Whatever we can do will only be efficient from our function as social

agents, during our class time and research activities. If our analysis is correct, *to stop the juggernaut we must cut the Borromean knot*. If we cannot stop the capitalist production of meaning, perhaps we can try to minimize our contribution to it. We suggest three distinct paths of action, each cutting one of the connections of the Borromean knot.

Cutting connection 1: Suppress the guarantee provided by the economy, suppress the production and appropriation of surplus-value, keep M20 and keep the credit system, but differentiate evaluation from promotion and change the promotion criterion: do not let promotion depend on measures or assessment of acquired M20 knowledge; instead, decide promotion according to the students' efforts while working cooperatively. Let each student collect only the amount of abstract social work spent by him/herself during school time. Eliminate the surplus-value.

Cutting connection 2: Suppress M20. Keep the credit system and keep the economic production of qualified-labor-power, but find another meaning to the rigid designator 'mathematics': "anything that addresses the status of mathematical knowledge should be legitimately considered as school mathematics" (Straehler-Pohl 2017, p. 50). Let school allocate or select people into professions of different economic values, but subtract from all promotional judgments any guarantee provided by M20; in particular, suppress the Kantian ethics from all judgments of pass/not pass.

Cutting connection 3: Suppress the credit system, let people approach M20 to the extent each person desires. Suppress the judicial function of the state in education, ensure that all students will pass with equal grades, let the classroom be a meeting place for people who want to improve the use-value of their qualified-labor-power and suppress certificates. In one word, rebuild the situation prevailing in the Soviet Union, delightfully described, for instance, by Borovik's (2016): school in absence of a qualified-labor-power market.

Of course, individual radical application of any of these possibilities leads directly to the subject's unemployment with consequent loss of political efficacy. We have been working on the first option for over thirty years, but we refrain to comment on it so as not to divert the readers' attention. On this issue, we refer to Baldino (1997) and Baldino and Carrera (1999).

Final words

After the 326 pages of Butler, Laclau & Žižek (2000) we arrive at a conclusion: "The very differential structure of meaning is collapsing, every determination immediately turns into its opposite" (326). Worse than that - and here is the point where we go one step ahead of Žižek and say that - *every new meaning that we try to produce immediately reveals itself as having been staged beforehand*, waiting for us to play it.

As we tried to show in this paper, good leftist intentions stemming from free will rapidly invert themselves and end up fueling the juggernaut. We dare one step further and speculate, beyond Žižek, that not only are our actions reversed against our intentions, but actually *our actions were programmed beforehand waiting for us to undertake them*. This makes sense: the market establishes a demand and waits for someone to undertake the enterprise. Capital keeps an open door and is just waiting for us to enter it. For the same feeling, exhibited from an artistic point of view, we refer to Potocki (1995) and Has (1965).

Therefore, we must conclude that we intend to improve *because we are supposed* to enlarge the gap that we are trying to close. We judge with impartiality *because we are supposed to* stimulate sadism. We strive for an ultimate mathematical certainty *because we are supposed to* fall into faith and contradictions of M20. We declare our freedom of thought *because we are supposed to* confirm the effect of the ideological interpellation of Capital on our qualified-labor-power. In short, we are not only constrained to reproduce ourselves as meaning and then fade into the level of the unconscious, but, on the contrary, under the juggernaut of Capital there is no room for the unconscious: it becomes a fantasy and we become 'shallow mechanical dolls'.

We must go deeper here. Of course, by submitting this paper we are subject to our own criticism. Having it accepted, we will be contributing to the circulation of a book as a commodity, therefore accelerating the juggernaut of Capital: 'Capital smiles satisfied'. However, the content of what is published (connecting the overwhelming production of meaning to terrorism) functions as a logical solution to the capitalism-terrorism

contradiction[15] and might dampen Capital's smile to some extent. This is as far as we can go to justify ourselves based on Žižek. However, continuing on this line of reflection (submitting ourselves to our own criticism) the deep point is the following: according to the conclusion of the paper, our action of submitting the paper would also be controlled by the capitalist *déjà vu* (it would have been planned beforehand[16], waiting for us to stage it). We too have acted as shallow mechanical dolls. Capital's smile is revitalized. Is there a way to escape this fate?

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[15] Contradiction in Hegel's sense.
[16] Hegel's so-called 'positing reflection'.

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