MULTIDISCIPLINARY STUDIES IN AN ERA OF AUTOMATED LABOR: GENDER, CULTURE, AND THE FUTURE OF DEMOCRACY

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INTRODUCTION.

In “Multidisciplinary Studies in an Era of Automated Labor: Gender, Culture, and the Future of Democracy”, we delve into the complex interplay between technological advancements and societal structures. This book aims to offer a comprehensive exploration of how green and digital transformation, combatting authoritarianism and automated labour, realignment and revisions of textbook content in four neighbouring countries and institutions in line with the values of democratic institutions, namely: Institute of Social Sciences and Humanities, Skopje (ISSHS, North Macedonia), Singidunum University/Faculty of Media and Communication (FMK, Serbia), Sofia University St. Kliment Ohridski (SU, Bulgaria), Panteion University (Greece). By employing a multidisciplinary approach, we seek to provide nuanced insights into the intersections with gender, cultural dynamics, and democratic systems, helping to illuminate the potential paths our societies might take amid the sweeping changes brought about by the social changes due to the digital era.

The importance of such a multidisciplinary approach is underscored by the challenges and opportunities it presents. While the convergence of different academic disciplines can sometimes lead to methodological complexities and epistemological tensions, it also offers a richer, more comprehensive analysis. This holistic understanding is vital for addressing the multifaceted nature of automated labour’s influence on society.

In the chapters that follow, we will investigate historical contexts of automation, specific societal and economic impacts in regions like Greece, the cultural and gender dimensions of technological change, the transformation of democratic processes, as well as ethical and policy considerations. We conclude by looking ahead to future challenges and research opportunities, inviting interdisciplinary dialogue and action. Through this exploration, the book seeks to equip readers with the critical tools needed to navigate and shape the future landscape of automation and its societal implications.

The most fundamental change is to grasp the changing of the concept of human in the digital transition era. Kolozova presents a complex understanding of the human as a materially determined hybrid that transgresses traditional boundaries between the physical body and machines, emphasizing its constructed nature. Drawing on Marx and Laruelle, she critiques the philosophical notion of the human, arguing for a “non-human” identity that is rooted in the real, or the material, rather than philosophical abstractions. This perspective suggests that the concept of human is not centred solely on subjectivity but is instead a joint product of broader socio-economic and technological contexts. In this perspective the digital environment reflets on the constitution of the subject and it is important in the educational sphere to be aware for the consequences of the transformation after the digital turn.

Ultimately, Kolozova calls for an understanding of technology as a prosthetic extension to the human experience, challenging capitalist structures and the neo-liberal rhetoric. Both Miglena Nikolchina and Katerina Kolozova engage with the idea that the human is not a fixed entity but a hybrid, shaped by external forces and internal desires that challenge the boundaries between humans, animals, machines, and the divine. Nikolchina examines how this polyvalence has historical roots in Romanticism and beyond, as authors of that era began autonomizing the automaton, reflecting on humanity’s continuous metamorphosis. In her view, the human condition is a process, a lack and a continual negotiation between the machine and the divine.

Athena Athanasiou addresses the significant impact of digital economies on labour and education systems in Southeast Europe, highlighting how digitalization complicates traditional understandings of work and exacerbates inequalities. She underscores the importance of critically engaging with digital subjectivities and challenging dominant narratives through community-based, participatory methodologies. Athanasiou encourages the development of “glitch epistemologies” to focus on dis-

ruption and resistance to highlight opportunities for social transformation amid the challenges posed by digital capitalism. In her article Daković frames this exploration within the concept of the "digital memory turn", highlighting the intersection between the digital era's advances and traditional memory studies. She emphasizes how digital technologies are reshaping our understanding of memory by influencing narrative structures, cultural identity, and the representation of history. The digital transition, she suggests, has led to a profound transformation in how memories are mediated and transmitted, requiring scholars to rethink established concepts of ontology, narrative, and cultural memory. Thus, the reader provides not only an analysis and interpretation of our contemporary circumstances surrounding labour automation, the digital transition, and the green transition, but also a critical dimension on the discussed topics.

This collection, therefore, acts not only as a repository of analysis and interpretation but as a critical framework for re-evaluating and reconstructing the foundations of education and democratic engagement. As academic institutions are urged to adapt, they are reminded to embrace moments of pause—*festina lente*—which offer the opportunity for deep reflection and thoughtful progression. Ultimately, this work invites readers to actively participate in shaping a future that reflects the diverse and multifaceted nature of the digital era's challenges and innovations.

Katerina Kolozova

SUBJECTIVITY AS INHERENTLY PHILOSOPHICAL ENTITY AND THE THIRD PERSON'S PERSPECTIVE

(from CAPITALISM'S HOLOCAUST OF ANIMALS: A Non-Marxist Critique of Capital, Philosophy and Patriarchy)

CAPITALISM'S HOLOCAUST OF ANIMALS

A Non-Marxist Critique of Capital, Philosophy and Patriarchy

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Subjectivity as inherently philosophical entity and the third person's perspective

In Marx's philosophical writings, in particular *German Ideology* and *Philosophical Economic Manuscripts 1844*, but also in his political economy we witness a project of transcending philosophy by means of its own conceptual material. In other words, he seeks to reverse the very relationship between the real and philosophy by postulating a theory, which grounds itself and any other theory or scientific investigation in the material, the real, in praxis and in direct, "physical and sensuous" experience. The latter strings of topics are recurrent philosophical themes that cut across the entire opus of Karl Marx and are not limited to a period. In other words, they are not divided by an epistemological break. I concur with Michel Henry when he argues that there is a constant interest in philosophy as well as a consistent treatment of it throughout Marx's opus (Henry, 1983). Marx's "philosophical project," is, arguably, a project of post-philosophy. Henry's argument is similar except he chooses to call Marx's humanism philosophy dealing with questions of "subjectivity and individualism" (Henry, 1983: 12). I will argue here that Marx deals with the question of subjectivity only to point out to it as the symptom

of what is fundamentally flawed in philosophy in general. The apex of the fallacy or the point of climax of what Marx seems to identify as pathological in all hitherto philosophy is found in Hegel. Marx never revised his stance on Hegel and the reconciliation between the two thinkers has been carried out by Lenin. I propose that we concentrate in this chapter on the question of "subjectivity" in the way it is addressed in Marx's own opus, namely in his *Critique of Hegel's Philosophy in General* (Marx, 1959) as well as in *The German Ideology* (1968), and explore how the main issues raised there resurface in the later works. We will concentrate more closely on the "problem of philosophy in general" he sought to tackle by his "march toward reality, toward the 'real material presuppositions' which constitute the teleology and the content of his philosophical reflection" (Henry, 1983: 13).

Nature, the capitalist automaton, and subjectivism of philosophy

I concur with Henry when he argues that there is no such thing as "epistemological break" in Marx as the above-presented themes are recurrent and underpin the entire opus organising it as a coherent whole. Marx's humanism has always been about materialism, which, in turn, Marx often and unequivocally reduces to naturalism. The latter is true not only of the early writings such as *Philosophical Economic Manuscripts of 1844* (*PEM 1844*) but also of *German Ideology* and *Grundrisse*. Marx's treatment of the concept of use value (1973: 114) is grounded in the attempt of materialist or physicalist vindication of value as such—in order for a value not to be a self-standing abstraction, it draws its sense from the physical use of the produce, food, shelter, etc. Each commodity is produced to serve the "physical and sensuous" (*PEM 1844*) needs. Such use of produce is called "use value" and it is determined by concrete "bodily form" (Marx, *Capital II*, Vol. 2, Chapter 22). Use value

is nurturing and protecting the physical self (as "selfhood" itself is in the last instance determined by physicality), and that is why Marx exclaims in *PEM 1844*: "This communism, as fully developed naturalism, equals humanism, and as fully developed humanism equals naturalism." The same argument resurfaces in the first volume of *Capital* and its critique of commodity fetishism, or critique of "abstracted materiality" or the abstraction of materiality, and, finally, in Marx's critique of automation of abstracted human labor in *Grundrisse* (1973: 618–630).

> But, once adopted into the production process of capital, the means of labour passes through different metamorphoses, whose culmination is the machine, or rather, an automatic system of machinery (system of machinery: the automatic one is merely its most complete, most adequate form, and alone transforms machinery into a system), set in motion by an automaton, a moving power that moves itself; this automaton consisting of numerous mechanical and intellectual organs, so that the workers themselves are cast merely as its conscious linkages. In the machine, and even more in machinery as an automatic system, the use value, i.e. the material quality of the means of labour, is transformed into an existence adequate to fixed capital and to capital as such; and the form in which it was adopted into the production process of capital, the direct means of labour, is superseded by a form posited by capital itself and corresponding to it. In no way does the machine appear as the individual worker's means of labour. Its distinguishing characteristic is not in the least, as with the means of labour, to transmit the worker's activity to the object; this activity, rather, is posited in such a way that it merely transmits the machine's work, the machine's action, on to the raw material—supervises it and guards against interruptions. (Marx, 1973: 620–621)

According to Marx, the industrial production, in its materiality, which includes the human body and mind too, is part of the universal machine of capital and

it is a self-sustained universe without the need of human skill to guide it. In a way, it emulates the "*abstract egoist—egoism* raised in its pure abstraction" of philosophy (1959*: Critique of Hegel's Philosophy in General*), i.e., the subjectivity centered reason as philosophical humanism. The prime mover of the capitalist automaton (of "value production") is generalised Reason shaped by philosophical humanism and the "post-" in the prefix does not move it beyond its determination in the last instance. This self-standing abstraction is the core of capitalist ontology based on the simple gesture of generalisation of a purely philosophical abstraction of *human subjectivity*, epitomised in Hegel's Absolute Spirit (Marx, 1959; 1968). Humans are the necessary conscious elements built into the automaton so they can serve the function of the conscious linkages of oversight of the automated operations. The worker is part of the process only to be used as a form of means of production, as part of the "fixed capital" or the material required for the machine (of capital) to endlessly circulate (Marx, 1973: 621). But the cycle itself that is perpetuated endlessly is a "senseless abstraction" that purports to be self-standing.

> The circle Money—Commodity—Commodity—Money, which we drew from the analysis of circulation, would then appear to be merely an arbitrary and senseless abstraction, roughly as if one wanted to describe the life cycle as Death—Life—Death; although even in the latter case it could not be denied that the constant decomposition of what has been individualised back into the elemental is just as much a moment of the process of nature as the constant individualisation of the elemental. (Marx, 1973: 138)

And, yet again, writes Marx, the "senseless abstraction" of Death-Life-Death has at least some relation to nature referring to the process of "decomposition" of the individual (body and self) back to the "elemental." The reference to a natural process reduces the "senselessness" of the Death-Life-Death abstraction. "Money-Commodity-Money" is, however, irreparably senseless as it does not find its determination in the last instance in the material as

natural. If a value is merely surplus value rather than use value, viz. value that is materially realised, it forms a circuit of an auto-referential abstraction: use value is not what moves capital but rather the surplus value or, simply, pure value. That is why the exchange comes down to M-M', which is the reason for Marx to identify it as "senseless"—the tautology is evident.

Moreover, it is senseless because abstraction cannot pretend to be other than an intellectual means, a faculty and instrument of cognition, a process that is materially determined in its last instance. (This argument is not made in line with any school of philosophical thought but is rather based on scientific data concerning the "material" mind and feelings are made of nerves, DNA, and the rest of the notorious "physical banality." Although it does correspond with Marx's claim that "spirit" is conditioned by "nerves and muscles" and thus the "depressed spirit" of wage laborer is explained throughout his oeuvre.) It is neither a purpose nor a cause—reality is material and, to Marx, that also means natural. Thus "spirit," "reason," or "meaning" is not only materially enabled but it is also its effect. Marx makes sure that his critique of the flawed metaphysics of capitalism is not misread as romantic vitalism: the contempt, and therefore the epistemic fallacy to disregard "the bodily aspects" of human production, including the means of production, is what underpins capitalist logic as moved by surplus value only (whereas the use value remains outside the capitalist equation). All of this "bodily reality" ought to be transformed into the self-standing abstraction called "capital" and the creation of surplus value, as explained in the quote below:

> In the process of production the purchased labour-power now forms a part of the functioning capital, and the labourer himself serves here merely as a special bodily form of this capital, distinguished from its elements existing in the bodily form of means of production. During the process, by expending his labour-power, the labourer adds value to the means of production which he converts into products equal to the value of his

> labour-power (exclusive of surplus-value); he therefore reproduces for the capitalist in the form of commodities that portion of his capital which has been, or has to be, advanced by him for wages, produces for him an equivalent of the latter; hence he reproduces for the capitalist that capital which the latter can "advance" once more for the purchase of labour-power. (Marx, *Capital II:* Chapter 19)

The subjection of the worker, of her body and "spirit" made of "muscle and nerves" (Marx, 1959), to the automated machine of capital is subjection of nature to the senselessness of the M-C-M abstraction. This concern as central stretches throughout Marx's opus, beginning with his early writings, surfacing in the *Communist Manifesto* of 1848 (Marx and Engels, 1969b) and, as demonstrated, reappearing in the *Grundrisse* of 1857–8. The contradiction of the capitalist-bourgeois conception and practice of production becomes evident precisely through the tension between capital both as automation and as the physical reality of machines used in the production, on the one hand, and the worker as physical reality and nature, on the other hand. This question, whose nature is apparently metaphysical, is tackled in what is supposed to be a political-economic program of *The Communist Manifesto*. The metaphysics of the tension between body and idea is transformed into socioeconomic and political programmatic stance:

> Owing to the extensive use of machinery, and to the division of labour, the work of the proletarians has lost all individual character, and, consequently, all charm for the workman. He becomes an appendage of the machine, and it is only the most simple, most monotonous, and most easily acquired knack, that is required of him. (Marx and Engels, 1969b: 18)

The consequences are of the category of internal contradictions of capitalism that can amount to a condition for a socialist reversal as the tension described below cannot be sustained in perpetuity:

> In proportion, therefore, as the repulsiveness of the work increases, the wage decreases. Nay more, in proportion as the use of machinery and division of labour increases, in the same proportion the burden of toil also increases, whether by prolongation of the working hours, by the increase of the work exacted in a given time or by increased speed of machinery, etc. (Marx and Engels, 1969b: 18)

The contradiction can be solved by seizing the means of production in order to reverse the very metaphysics of capitalism: endlessly increased productivity and endlessly exploited nature will make no sense because use value—or simply the practice of use with no reference to "value"—will replace surplus value as the prime mover of production. Use value is determined by materiality and exhausted in its material consumption or consumability. Such should be the metaphysical reversal to be brought about by communism conceived as "the riddle of history solved" (Marx, 1959). Indeed, what the mature Marx presents as the solution to capitalism is about the "humanism as naturalism" thesis of the early works and, in his own words, "Communism is the riddle of history solved, and it knows itself to be this solution" (Marx, 1959). And indeed, concurring with Michel Henry, let us reiterate, there was never such thing as an "epistemological break" and, therefore, the triad of humanism-naturalism-communism reappears as a minimal structure of his political project in the later works too (as demonstrated above).

> An interpretation such as this [referring to the "break"] is not only abusive, it is categorically denied by Marx himself, when in 1859, with the distance of intervening years, he makes the irrevocable judgment in the preface to the *Critique of Political Economy* by which the radical critique of German thought as well as the clear awareness of its results are attributed to *The German Ideology* […] "When in the spring of 1845, he [Engels] too came to live in Brussels, we decided to set forth together our conception as opposed

> to the ideological one of German philosophy, in fact to settle accounts with our former philosophical conscience. The intention was carried out in the form of a critique of post-Hegelian philosophy. The manuscript, two large octavo volumes, had long ago reached the publishers in Westphalia when we were informed that owing to changed circumstances it could not be printed. We abandoned the manuscript to the gnawing criticism of the mice all the more willingly since we had achieved our main purpose—self-clarification." (Henry, 1983: 10)

Henry cites the preface to a much later work by Marx in reference to a work of the already mature phase, i.e., *The German Ideology*, to demonstrate that Marx himself declares continuity between his early philosophical writings and the themes and methods pursued in his later works. *The German Ideology*, even if not published during Marx's lifetime (due to a publisher's failure to do so), has served its main purpose—philosophical "self-clarification," states Marx himself. The self-clarification, apparently, amounts to (a) the development of a method that enables an exit from philosophy's circular self-enclosure, (b) a grounding of a post-philosophical science of the species being of humanity, and (c) a method that is radically materialist and, as a consequence, also naturalist. In doing away with Hegel, Marx is doing away with philosophy and he says so himself explicitly and unequivocally in *The German Ideology*.

> German criticism has, right up to its latest efforts, never quitted the realm of philosophy. Far from examining its general philosophic premises, the whole body of its inquiries has actually sprung from the soil of a definite philosophical system, that of Hegel. Not only in their answers but in their very questions there was a mystification. (Marx, 1968)

The shift toward science Marx proposes is a shift toward a science issuing from philosophy and, therefore, drawing on its conceptual material. It is a

science of humanity grounding itself in humanity's auto-referential narrative par excellence—philosophy. It seems there is, as if were, a perfect homology in structure and substance with Laruelle's non-philosophy: philosophy ought to turn into science that deals with the human universe whereby philosophy and world are synonymous. Therefore, both philosophy and the world are not examined in their totality but rather treated as "chôra" or cosmologically unorganised material to be studied in its unilaterality. Indeed, there is no surprise in this realisation as Laruelle himself reveals in his *Introduction to Non-Marxism* to be heavily indebted to Marx in the development of his method of non-philosophy and, therefore, also its later variation: non-standard philosophy (2014: 11, 14, 73, 174). Just as Laruelle proposes a science of humanity as the result of his non-philosophical radicalisation of philosophy so does Marx speak of humanism grounded in praxis and, consequentially, nature.

In order to arrive at a scientific account of humanity one needs to posit it axiomatically in a way that is fundamentally different if not opposite from the one that defines philosophy: the real and the real of humanity are in the last instance determined by matter or physicality and praxis, and, in giving an account of them, the thinking subject submits to the real rather than to any philosophy. Such is the position of Laruelle's non-philosophy but also of Marx: "The production of ideas, of conceptions, of consciousness, is at first directly interwoven with the material activity and the material intercourse of men, the language of real life. Conceiving, thinking, the mental intercourse of men, appear at this stage as the direct efflux of their material behaviour" (Marx, 1968: 6). The axiom at issue proffers a sufficient postulation of a post-philosophical project of formulating a method of human sciences. In order for such a project to succeed, as previously discussed, Marx insists a "third party's" perspective of theorising ought to be adopted.

"Subjectivity" and its status in philosophy and capitalism

Marx's claim is that the fundamental problem of philosophy is precisely its subjectivism and, therefore, production of a thought that is one of "the universal egoist," or rather the human self that has abstracted itself from the physical world in the form of "self-consciousness" cannot study either itself or the world objectively, due to its inability to posit itself as objective reality vis-à-vis other realities, third parties so to speak. Philosophical reason, culminating in Hegel's philosophy, as Marx insists, posits the objective world subjectively; i.e., it submits the exterior reality to the constitution of the subject as self-consciousness, which, in turn, posits itself as a self-standing entity substituting objectivity. Self-consciousness treats the exterior reality or the objective world as mere material of its constitution. Also, the self-standing reality or even entity of self-consciousness is to be understood as a superior form of objectivity. It is the objectivity more objective than objectivity itself, just as in Laruelle's critique philosophy appears to produce a superior form of the real—the being (an amphibology of the real and truth or truth as the real), one more real than the real itself. We are not speaking here of Marx being blind to the problem of *noumenon* or Laruelle's inability to recognise the foreclosure of the real, but quite the contrary: the foreclosure is admitted and what the thinking subject can do is submit itself to its structure and syntax and attempt to "code" it, mediate it, transpose it onto the plane of the transcendental or language, recreate it as sign. Such transpositions are the material praxis enabling the transcendental product of describing and explaining exterior reality or the real. The description will be scientific—and I would add artistic too—if the subject is capable of conceiving itself as an objective reality, not the other way around (adopt the third party's perspective). Such is the basis of Marx's non-anthropocentric scientific method and, yet again, one determined by humanity as its identity in the

last instance, as elaborated in the chapter "Opposition of the Materialist and Idealist Outlook" in *German Ideology*.

> This method of approach is not devoid of premises. It starts out from the real premises and does not abandon them for a moment. Its premises are men, not in any fantastic isolation and rigidity, but in their actual, empirically perceptible process of development under definite conditions. As soon as this active life-process is described, history ceases to be a collection of dead facts as it is with the empiricists (themselves still abstract), or an imagined activity of imagined subjects, as with the idealists. Where speculation ends—in real life—there real, positive science begins: the representation of the practical activity, of the practical process of development of men. (Marx, 1968)

Seeking to establish knowledge of the exterior reality in a way that mirrors the subject, both the individual and the assumed universal (human) subject, is, as already discussed, a philosophical gesture par excellence. If, conversely, one adopts Marx's method, one should also seek to conceive of themselves as being an object to a third person's gaze amidst an objective world.

> Whenever real, corporeal man, man with his feet firmly on the solid ground, man exhaling and inhaling all the forces of nature, posits his real, objective essential powers as alien objects by his externalisation, it is not the act of positing which is the subject in this process: it is the subjectivity of objective essential powers, whose action, therefore, must also be something objective. An objective being acts objectively, and he would not act objectively if the objective did not reside in the very nature of his being. He only creates or posits objects, because he is posited by objects—because at bottom he is nature. In the act of positing, therefore, this objective being does not fall from his state of "pure activity" into a creating of the object; on the contrary, his objective product only confirms his objective activity, his activity as the

> activity of an objective, natural being. (Marx, 1959: "Critique of Hegel's Philosophy in General")[1]

Or put differently:

> To be objective, natural and sensuous, and at the same time to have object, nature and sense outside oneself, or oneself to be object, nature and sense for a third party, is one and the same thing. (Marx, 1959: "Critique of Hegel's Philosophy in General")

To posit the contrary is to pursue philosophy, argues Marx in *The German Ideology* (Marx, 1968). The thought that is centered on subject/ivity is essentially philosophical and this is the sufficient necessary criterion to distinguish philosophy from the scientific thought and the artistic practice. The paragraph from the preface to *Critique of Political Economy* cited above, let us recall, is Marx's testament that *The German Ideology* should be considered as the crystallisation of Marx's and Engel's critique of philosophy (leading to a science of the species being of humanity). In it he seems to have radicalised instead of abandoned his "scientific humanism" and the exit from philosophy or the transcendence of its auto-fetishism remains the prerequisite of such project.

> German criticism has, right up to its latest efforts, never quitted the realm of philosophy. Far from examining its general philosophic premises, the

[1]In the German original (available in the Marxist Internet Archive): "Wenn der wirkliche, leibliche, auf der festen wohlgerundeten Erde stehende, alle Naturkräfte aus- und einatmende Mensch seine wirklichen, gegenständlichen Wesenskräfte durch seine Entäußerung als fremde Gegenstände setzt, so ist nicht das Setzen Subjekt; [A*] es ist die Subjektivität gegenständlicher Wesenskräfte, deren Aktion daher auch eine gegenständliche sein muß. Das gegenständliche Wesen wirkt gegenständlich, und es wurde nicht gegenständlich wirken, wenn nicht das Gegenständliche in seinen Wesensbestimmung läge. Es schafft, setzt nun Gegenstände, weil es durch Gegenstände gesetzt ist, weil es von Haus aus Natur ist. In dem Akt des Setzens fällt es also nicht aus seiner „reinen Tätigkeit" in ein Schaffen des Gegenstandes, sondern sein gegenständliches Produkt bestätigt nur seine gegenständliche Tätigkeit, seine Tätigkeit als die Tätigkeit eines gegenständlichen natürlichen Wesens."

> whole body of its inquiries has actually sprung from the soil of a definite philosophical system, that of Hegel. (Marx, 1959: "Critique of Hegel's Philosophy in General")

Nature, life, and physicality resurface a few pages further in the text, along with the insistence that materiality ought to determine thought rather than the other way around or else we remain entrapped in philosophy:

> In direct contrast to German philosophy which descends from heaven to earth, here we ascend from earth to heaven. That is to say, we do not set out from what men say, imagine, conceive, nor from men as narrated, thought of, imagined, conceived, in order to arrive at men in the flesh. We set out from real, active men, and on the basis of their real life-process we demonstrate the development of the ideological reflexes and echoes of this life-process. (Marx, 1968: *The German Ideology, Part 1: Feuerbach*)

By the very structure of thought subjectivity as the organising principle of an analysis or a theory induces anthropomorphism or atavistic humanism. Individuation conceived in materialist terms, on the other hand, is determined by matter or its elements to which it inevitably dissolves as we read in the paragraph from *Grundrisse* quoted above. Individuation is praxis of the matter and the individual life form, including human, is its result. It is not a process that could predetermine the elements or atoms but always their result—the unruliness of the real is the thesis Marx defended since his dissertation on atomism, i.e., the defense of the Epicurean principle of *clinamen* in Greek atomism. The argument is similar to that made by Simondon: forms do not preexist matter and its movement; they are not fixed and separated from matter, or simply "the individual does not preexist individuation" (Simondon, 2007: 12). More importantly, "the notion of form should be replaced by information, which presupposes the existence of a system in a state of metastable equilibrium endowed with the capacity of individuating itself:

information, unlike form, is never a unique term, but rather a signification surging from a disappearance" (Simondon, 2007: 12). The information that forms individuation is subject to continuous change and, therefore, the morphology of the existing material universe is not exhausted.

To speak of post-humanism is still human centered. On the other hand, to advocate Marxian humanism is to advocate a science of a particular form of reality and history, an instance of individuation materially and historically conditioned, which has its own and unique morphology and identity in the last instance. It is one among the many subject matters of scientific inquiry, and to name it "human" is not about anthropomorphism of thought and human-centeredness but rather about identifying in the last instance the object of inquiry as determined by a particular configuration of materiality. I have proposed at the beginning of the book to radicalise the concept by distinguishing it from philosophical post-enlightenment humanism but also by submitting it in the last instance to the (material) real of humanity and have, thus, termed it "non-human." Let us reiterate, materiality or the determining real insofar as materiality is not necessarily living and organic physicality but also synthetic and machinic too—the "information" stems from materiality. From a materialist point of view, the information is determined in the last instance by the real (of the material), which does not change the fact that the transcendental and the real are in a relation of unilaterality. The automaton is indeed a self-enveloped universe, operating on a premise of its self-sufficiency, and it could indeed constitute a universe completely independent from humanity, as David Roden argues in his discussion on technological substantivism (Roden, 2014: 150–165). Nonetheless, the material basis is a prerequisite for its sustenance. And if the physicality (organicity) or materiality and the automaton constitute such irredeemable asymmetry of political power, resulting into an utter holocaust of the physical (including the human animal) used for sustaining the automaton, we end up with a tautological universe of value/sign production based on an annihilating exploitation of all physical.

Still, such dystopian phantasy is utterly naive—the automaton is devoid of volition and, therefore, at a certain point in time, the exploitation and full combustion of the physical will leave it stripped of its material basis. Without it, the automaton of techno-capital will find itself dismantled. The phantasm of techno-capitalist omnipotence is refuted by the reality of the comical mortality of every automaton, symbolised in the image of a useless floppy disc or Comodore 64.

Speaking in terms of Marxian materialism and non-philosophical realism, the identity in the last instance is materially determined. It can mutate but the mutation must be the product of a mediated materiality rather than imposed imprint of some self-standing form detached from the real as material. If the identity in the last instance at issue is "the human," it is treated as any other identity in the last instance, i.e., in its radical finitude rather than in terms of hegemonic expansion. The possible mutations of form are subject to determination in the last instance as material or, more specifically, they are information. Thus, the concept of information in our discussion is materially determined rather than in terms of the transcendental and the immanent, which are categories that can be applied on material and immaterial reality depending on the type of theorisation but cannot serve as determinations in the last instance. Therefore, a non-anthropocentric post-humanism would radicalise the human and construe a discourse of humanity in scientific terms determined and delineated by the finitude of the reality (of humanity). A Marxist analysis and critique of the treatment of the physical in philosophy and capitalism will lead us to identifying the intersecting and commonly produced realities by the humans and the animals.

If the post-human is extension of humanity, then technology is subjectively speaking prosthesis whereas, objectively, it remains a means of production as Marx treats it in his *Grundrisse: Foundation of the Critique of Political Economy*. The tendency to subjectivise technology, to produce mimicry of humanity, is about "philosophical spontaneity" (Laruelle, 2013a: 9–10) to

depart from the given of an individual instead of the process of individuation (Simondon, but also Marx in the *Grundrisse*) as a proper materialist point of departure. A post-philosophical and radically non-humanist axiom will permit variations of individuation, morphologically, structurally, and in substance that will be grounded in the physical materiality regardless of whether organically created or synthetically produced. The possibility of forms, physically speaking, which also includes cognitive consequences, is not exhausted with variations of human form. In line with the same method, radical humanism submits to the materialist determination of the identity in the last instance without transforming it into an ontology, without the philosophical gesture of grounding reality and the real itself but rather correlating with the real. It views humanity in its unilaterality or in terms of the finitude of its determination in the last instance; it is subject to a Vision-in-One as Laruelle would put it (Laruelle, 2013a). Thus, the extension or mutation of technology into ontology—or of *thechné* into *tò ôn*—is a philosophisation of the question, whereas what we propose is a non-philosophical treatment of the technological reality or rather one of a science based on non-philosophy and on Marx's own writings. As already expounded, the scientific treatment of philosophical material—including considerations of technology—can find its model in structuralist linguistic or other methods of more elaborate formalisations of categories derived from philosophy such as psychoanalysis. The ontologisation leads to inevitable subjectivisation as the place philosophy always already arrives at, as Marx explained. Hegel is but the climax of all that is immanently philosophical, writes Marx, and so subjectivism in Hegel as criticised by Marx is what each or all philosophy inevitably amounts to. Therefore, that detached abstraction presuming to constitute a self-sufficient reality called the subject is the mode and posture of thought that is essentially philosophical as well as essentially capitalist as it is worth or value in its purest form, as a self-standing and self-sufficient universe, fully dematerialised.

> The self-abstracted entity, fixed for itself, is man as *abstract egoist—egoism* raised in its pure abstraction to the level of thought. (Marx, 1959: "Critique of Hegel's Philosophy in General")[2]

It is with the posture of thought of the "abstract egoist" that one could envisage "human rights" for the robots or the artificial intelligence (AI) while the possibility of non-subjectivation is not even considered. The "self-abstracted" entity called the human, post-human, or transhuman is the philosophical spontaneous foundation of technological ontology. In that ontology the limits and the form of the universe are those of the subject. Therefore, all practical philosophy, ethics and politics, is framed in terms of subjectivisation or individual rights: "should the robots have human rights?," regardless of whether the robots are utterly indifferent to that question as the real is to the transcendental. Instead, one must ask if we can speak of subjecivisation and subjectivity, and also of individuality and collectivity, and, finally, of rights. Rights to what? To "dignity," "respect of individual choice" or "identity"? Or right to life? If one can speak of life of robots, then perhaps one can speak of rights to life as well. Still, prelingual or postlingual entities, robots and animals equally, are perhaps best protected in terms of defense of` their physicality and right to life (which also makes the absence of pain relevant) rather than rights that would emulate abstractions of humanism such as dignity, individuality, identity, etc.

Philosophical impoverishment or a move toward formalisation/universalisation of the categories "nature" and "rights"?

Anthony Paul Smith explains that although the idea of "nature" serves as a limit or conditioning exteriority of philosophical reason, it is nonetheless

[2]In the German original available in the online Marxist Internet Archive: "Das für sich abstrahierte und fixierte Selbst ist der Mensch als abstrakter Egoist, der in seine reine Abstraktion zum Denken erhobne Egoismus" (Karl Marx and F. Engels (1967), *Werke, Ergänzungsband, 1. Teil*, Berlin: Dietz Verlag.

product of that same reason (2013: 14–15). That is why the notion of nature should be radicalised by identifying it in the last instance as the clone determined by a singular and unilateral real. It is reducible to physicality but as physical reality can also be artificially produced and sustained, i.e., through human intervention and technology as means of production, whereas nature is the opposite to that, the identity in the last instance needs to be centered on the opposition in question. In order to divest nature of its philosophical representation with the goal of arriving at its non-philosophical definition, we will have to circumvent the trajectory of the "principle of sufficient philosophy" (or *PSP*) and clone the real that determines the notion. Laruelle calls the clone a "description" guided by the syntax of the real—we have elaborated this procedure at length in the preceding chapters, in particular in Chapter 2—and in our case the operation of "cloning" will probably be about marking the trace (coding, inscribing signs) of the structure of a physicality that is *not* produced and maintained via the means of human *techné.* Although such definition is never entirely unambiguous as it relies on an exclusion and, therefore, negation, it will serve as the description that is determined by the real and as an identity of the last instance. We could radicalise or simplify it further in order to arrive at a greater level of formality—in nature, staying in life is autonomous process, an automaton independent from technological intervention even if or when aided by it. Thus, even though the "prime mover" may be a technology, the automaton of life persists on its own.

This automaton is embedded in the material, it is a material process as a matter of fact, and information is part of it as Simondon argued. Life is, therefore, the material process of automated self-preservation guided by something we would call, in a lack of better term, Spinozian *conatus*. The tendency to reduce pain and, instead, increase pleasure issues from the *conatus* itself as Spinoza argued (Spinoza *E III* 29p, 30, 30p). Reducing it in the others concerns the individual not only altruistically but also egotistically: the suffering of the others enters the image of reality and affects (reduces) the level

of pleasure in the individual (*E III*, 30p). It leads us to a realisation that Spinoza has applied the method Marx favored centuries later, one we discussed earlier in this chapter (and in the previous chapters)—the perspective of a "third party," whereby the binary of subjective/objective becomes obsolete. *Conatus* is an identity in the last instance, which is determined by the material reality of *life* or it is sublated by the notion of *life*. Therefore, it cannot serve as its determination in the last instance, and the question of divesting the category (of life) from romantic philosophical projections remains unanswered. Instead of following the theological trajectory proposed by Spinoza, let us take a detour and return to the materiality (of life) and its adequate clone or minimal yet fully exhaustive *description*.

The Maßstab (in Wittgenstein's sense discussed previously) of life is found in the processes of becoming individual, staying in life as such and then disintegrating as individual into elemental materiality and in the fact that this automated process is sustained without human intervention. The latter, as already noted, can occur and such occurrence can be a variable in the self-sustained circuit of life. Such automaton is, therefore, in a defining way distinct from the transcendental inventions of humanity including the automaton of capital and its pretentious aspirations that technology or its means of production can constitute a self-standing reality, ideally without any physicality regardless of whether natural or artificial, whether living or not. As already explained, in capitalism, matter is "mere material" to value production and its disappearance enables full value.

A complete holocaust of materiality will amount to the rule of the Absolute Spirit of Capital creating a dead universe and also static—M-M' tautology amounts to motionless affirmation of an abstract identity of Value in and for itself. Therefore, the Maßstab and the clone of "nature" are determined by the automaton of material reality unaided by human intervention in the last instance (save as a variable). The automaton of material reality of nature seems to be identical in the last instance to the "philosophically impoverished"

description (Laruelle, 2014: 2) we gave of life as materially determined or, as Laruelle would put it, that is how we *cloned* it. In case of "life" human or technological intervention—or more precisely, capitalo-philosophical intervention—is also to be treated as a variable instead of a determination in the last instance. Formally speaking, and in the context of the presented post-philosophical discussion of radicalised metaphysics of socialism, concerning the reversal of the positions of the physical and the "idea"/"reason," and its political economy, the categories of life and physicality (even if biologically non-living) are interchangeable and can be treated as the same. The living organisms are determined by the ratio of elements that can be found in the non-living physical world such as carbon, hydrogen, and oxygen as well as of proteins and other molecular compounds.

"Rights" are in their last instance determined by the reality of language. The material fact of the ability to use language and thus place a claim to a certain kind of treatment by institutions and states is the determination in the last instance. A claim to something or someone that does not issue from appetite (in Spinozian sense), but is founded on a justification, entails the ability to elaborate it mentally and to enunciate it by use of language, is what determines "right" in legal and political sense. If we are to elaborate "rights" for prelingual or postlingual entities, i.e., for animals and robots respectively, we must resort to post-philosophical discursive possibilities that take us beyond the concept of "rights" as humanist invention. A new social contract that abolishes the possibility of exploitation of life for the purposes of creating surplus value is required. It requires an inauguration of a completely new and unprecedented law and ought to rely on a gesture of Schmittian enactment of sovereignty—the introduction of the new law should resemble a "religious miracle" (Schmitt, 1985: 36) or Walter Benjamin's "divine violence." It would have the status of an axiom of a newly postulated world or a world postulated a new, and the logic of "rights" will not be required in order to provide justification for an effective right.

> But if the existence of violence outside the law, as pure immediate violence, is assured, this furnishes the proof that revolutionary violence, the highest manifestation of unalloyed violence by man, is possible […] Divine violence, which is the sign and seal but never the means of sacred execution, may be called sovereign violence. (Benjamin, 1999: 300)

A new horizon is needed in which "the right to life" is not discursively negotiated, in which it is not a question of legality but rather a question of sovereign violence that is "the sign and the seal" of a law that will insure it. For such primitive lawmaking to take place, one that stems from the ruins of a previous world, one born as if ex nihilo and out of the substance of divine violence, a revolution is prerequisite. I will argue that revolution is never in singular but rather a multiplicity of acts: they can all be determined in the last instance by the materiality consisted of the revolt of the suffering bodies in conditions of capitalism and by the types of exploitation specific of the suffering. They can all be moved by the same goal, such as establishing a socialist society whose material determination in the last instance would be the abolition of surplus value, but they do not have to be a totality of operations of instilling a predetermined system. The concepts and strategies of lawmaking and institution-building can be born and can develop in different variants depending on different situations. It can be a multiplicity of unilaterally determined realities, moved by numerous instantiations of the same material determination in the last instance, that of establishing a socialist world defined by the absence of surplus value.

The precondition for such order is the "right" to life that is pre-legal and yet again law enabling: the establishment of the new social contract relies on the axiom according to which value is materially determined and is thus non-alienated from physicality and without the tendency to subjugate and exploit it for the production of "value." Thus not merely surplus value but value *tout court*. According to the socialist utopia we are sketching out here, the loss of

physical life for the sake of use is determined as life-preserving and should, therefore, regain its sacral status. If such loss is necessary, its transformation on the transcendental plane is required and should be one of sublimation and sacralisation. Considering that it is a matter of culture and technology, we have to conclude that signification and, therefore, value in some utterly new form are produced. What makes that production non-capitalist is that it is not intended for surplus value but also that value is not a self-standing entity and, finally, that the exploited body is not commodified—it is not abstracted and then its value is not fetishised as money and the symbolisms it can afford. As we know from Benjamin and Agamben, sacralisation is enacted in a state of exception when the laws are suspended (Agamben, 2005: 24). Therefore, in a socialist political economy and according to its metaphysics, physicality, and in particular that which is living, is not exploited but its sacrifice is possible under the condition of state of exception only and in the name of use value that is "life increasing." Objectivisation as commodification through abstraction detached from and hostile to physicality or materiality is an utterly different metaphysical stance and ontology enabling both economies, capitalism and philosophy. Sacralisation of life lost in the name of preservation of life takes place under the condition of state of exception and cannot, therefore, be transformed into an industry and object of monetary exchange. The principle law, one that acts as the axiom for the legislation and institutionalisation of the new socialist order, continues to posit that exploitation of life and materiality in the name of surplus value is impermissible as essentially capitalist and contradictory to the socialist utopia.

Holocaust is originally a sacrificial burning of animal flesh. In Greek religion, the sacrifice of animals was always the task of men, priests or not, and this holy sacrificial rite was called *hiereia* or *holocaustos*. Women were, on the other hand, in charge of the sacrifices to the chthonic deities and the dead that never included flesh but rather consisted of grains, liquid offerings such as wine and water or honey, but also dried fruits (Alexiou, 2002: 9–10, 16, 32; Mouliner,

1950: 209, 210, 73, 111, 80–81, 109). The *hiereia*, or the sacrificial ritual dedicated to the life-preserving deities, to the light and reason the Olympians represented, entailed *holocaustos*—burning of the dead animal. Unlike the *enagismata*, the *hiereia* or the *holocaustos* is pure and purifying, the foundation of *logos* and law and order in the polis. The destruction of the physical body ensures immortal light of reason. The complete holocaust of all animal life will insure the complete rule of pure reason or of the Absolute Spirit—the perfect form of capitalism-as-philosophy. *Hiereia*, however, constituted an exception that helped the *polis* preserve normality and continuity of life: they remain attached to the physical body, matter matters and determines the transcendental product, or the sublimation of the sacrificed burnt body into a higher form of existence, i.e., the transcendental. The rites of *hiereiea* cannot be transformed into "pure value," into an abstracted from the body ethereal value transformed into a signifying chain within which exchange and accumulation of worth may take place. They are determined in the last instance by the flesh subject to holocaust and by the fact that the body of sacrifice is determined by the reality of being in a state of exception rather than part of a massive hyper-production (of surplus value) of fetishised abstraction. A complete holocaust equals competition with the immortal gods, and that is *hubris*—the transgression that invites the tragic fall. An absolute transgression brings about an absolute or irredeemable *hamartia*.

Athena Athanasiou

EPISTEMOLOGIES FOR DIGITAL JUSTICE? ADDRESSING INEQUALITIES IN THE DIGITAL ECONOMY

This text sets out to outline how digital economies and their concomitant sociocultural formations and practices impact labor conditions and configurations of education in the Southeast Europe. The study of these ongoing societal transformations in the context of increased labor automation and digitalization challenges the ways we consider temporal and spatial connections within globalized capitalism and the ways we interpret technology, connectivity, embodied subjectivity, gender, infrastructure, technology, and the human-machine relations within social sciences.

Therefore, new interdisciplinary epistemologies are needed to delve into these shifts in global political economy, taking into consideration the ways in which the sped-up temporality of im-material labor problematizes and complicates what is recognized as "work", "workplace" and "workforce". Feminist thought has importantly challenged essentialist descriptions and conventional categorizations of "work". Also, such epistemologies need to account for digital geographies and situated encounters through which digitalization becomes a constitutive aspect of the gendered and minoritized contours of invisible/unpaid labor and precarity. In order to do so, they pose questions concerning the relationship between labor and the social production of knowledge; a relationship bound up with power asymmetries in relation to class, gender, and ethnicity.

In order to account for the challenges posed by a digitally transformed present in a Europe of intense structural inequality, we need to bring forth epistemologies of digital education that remain committed to the principles of gender and intersectional equality, democratic administration, and equally accessible public services and resources of care and education. Therefore, these social epistemologies need to reconsider and rearticulate the promise of democratizing work that digitalization has held out.

Does the ongoing digital transition add new impetus for improving intersectional equality? Or does it expand gender, class and citizenship disparities in Europe? How could we shift from a gender-blind digital economy to enabling and promoting gender transformative policies, informed by critical epistemologies, such as Marxist and post-Marxist, postcolonial, Black feminist, and queer of color? How could such democratic management be even possible insofar digital economies are driven by profit? To what extent are digital social rights and fair digital economies possible in the algorithmic milieu of digital capitalism?

In a Southeast Europe of intense intersectional inequalities and precarization of labor, and at a time when the most jobs likely to be displaced by digital automation (especially in a platformizing labor market) belong to women* (and) migrants, how can we imagine and implement socially just (digital) economies? How does digitalization account for the "feminization" of remote work? How is algorithmic discrimination to be combatted? And how might equal pay, occupational safety, social security, workers' rights, collective bargaining, and a fair work environment be ensured in an increasingly digitalized labor market? Guided by such questions, we seek to generate knowledge on research methods, concepts, and sensitivities able to counter "epistemic oppression"[1] and to bring forth alternative social imaginaries of digital connectivity and education.

As the world of work is rapidly digitalized and reshaped, especially in the context and in the aftermath of the COVID-19 pandemic which has accelerated this process without affecting everyone equally, we need to make better sense of how this transition disproportionately impacts groups at risk of being marginalized in the digital economy, including women, ethnic minorities, people

[1] Dotson, Kristie. "Conceptualizing epistemic oppression." *Social Epistemology* 28.2 (2014): 115-138.

with disabilities, as well as refugees, displaced people and migrants. More research is needed on the gaps between regions in terms of digital employment. Also, the ways in which digital work is outsourced from the global North to the global South need to addressed and analyzed.

Southeast Europe, considering its power asymmetry compared to the Northwest of Europe as well its economic underpinnings, is concerned with designing and supporting higher education learning and research projects focused on the study of platform-mediated working arrangements, in all their local, translocal and regional specificities. However, epistemological and institutional endeavors to equip students with digital skills should enable them to critically grasp complex aspects of emerging digital realities, including, notably, the uneven ways in which digital subjectivities are produced, distributed, and culturally mediated.

From this standpoint of acknowledging differentially situated subjectivities within digital(ized) landscapes, epistemologies to prompt critical reflection about barriers and asymmetries in terms of access to education, devices, infrastructure, and skills should be developed and updated.

Following this line of inquiry, rather than narrowly economistic and depoliticized worldviews of digital transformation, we might instead promote epistemologies of digital education that focus on the social and public values, impacts and potentials of the digital. Contrary to top-down norms of innovation, we need to generate epistemological approaches that reorient attention to local, participatory, and community-based experiments of socially just and environmentally sustainable connectivity and knowledge production. Instead of individualization of digital rights according to the neoliberal paradigm (i.e., "individual data protection", "privacy", etc.), it is vital to promote epistemologies that take into account sociocultural aspects of connectivity, including just working conditions, inclusive welfare infrastructures and equally accessible public services.

In trying to make sense of aspects of digitalization such as algorithmic thought, automated cognition, and computability, this epistemological and conceptual work needs to enable ways to reflect on the complex intersections between the sensible, the affective, and the cognitive, without reducing the complexities of social and cultural processes to technological determinism. This engaged mode of critical inquiry understands itself as historically situated, provisional, and open-ended. Distancing itself from positivist impulses, it addresses the possibility of social transformation as irreconcilably contingent upon subjection, constraint, and duress, rather than subsumed under the logic of continuity, linearity, effectiveness, and coherence.

Attending to different positionalities and communities of critical theory and activism in multiple Souths, this epistemological and conceptual work engages the situated knowledges of those who are subjected to social oppression and epistemic marginalization and turn out to challenge dominant discourses and practices of knowledge production in the form of "epistemic resistance".[2] Migrant and refugee activism is one such powerful site from where counter-hegemonic discourses can emerge to point to different enactments of citizenship, knowledge, information, connectivity, and democracy in the here and now, beyond the essentialist and exclusionary logic of the nation-state. In that respect, Sandro Mezzadra and Brett Neilson (2013), in interweaving the proliferation of borders and bordermaking with the intensification of competition and exploitation within a globalized labor market, significantly approach the border as a method, or an epistemic framework, in ways

[2] José Medina (2013). *The Epistemology of Resistance: Gender and Racial Oppression, Epistemic Injustice, and Resistant Imaginations*. Oxford: Oxford University Press. Also: Robin Celicates, "Remaking the Demos 'from Below'? Critical Theory, Migrant Struggles, and Epistemic Resistance", in Didier Fassin and Axel Honneth (eds.), *Crisis Under Critique*, 2022.

that enable new critical perspectives on citizenship.[3]

Through this perspective, we need epistemologies that reconceptualize notions and questions of labor, citizenship, and power in the present conditions -and various geographical contexts- of postcolonial capitalism. We need epistemologies that ask under what conditions, for whom, and at what cost particular systems come to be perceived as "intelligent". In this sense, we might follow the lead of Elwood and Leszczynski (2022) who argue for "glitch epistemologies" to call attention and analytical focus toward moments of disorder, disorientation and performative failure in processes of perceiving digital systems.[4] This requires rethinking (and unlearning) much of what we often take for granted, such as science, technology, economy, labor, and education. Finally, it requires working across multiple differences for plural and multidisciplinary epistemologies of collaboration and positionality to open up dominant epistemic regimes to different ways of knowing, re-knowing and un-knowing as a response to current and ongoing injustices.

[3] Sandro Mezzadra and Brett Neilson, *Border as Method, or, the Multiplication of Labor*. Durham: Duke University Press, 2013.

[4] Agnieszka Leszczynski and Sarah Elwood (2022). "Glitch epistemologies for computational cities". *Dialogues in Human Geography*. See also: Elwood S and Leszczynski A (2018) "Feminist digital geographies". *Gender, Place & Culture* 25(5): 629–644.

Miglena Nikolchina

ON (NOT) WANTING TO BE HUMAN: MAN AND ROBOT

In the wake of the Cartesian equation between animal and automaton the romantics (Kleist, Hoffmann, Mary Shelley) launched the autonomization of the automaton, which from that point on has accrued a formidable fictional and philosophical dossier. The essay explores contemporary imaginative recreations of the "quadrilateral" of the human – the human vis-à-vis the animal, the robot, and the divine – focusing on the shifting perspectives in the *Alien* film series. The coincidence of wanting and not wanting to be human is thus argued to be *the* definitive characteristic of the human which, hence, is necessarily transhuman.

Key words: animal, robot, human, transhumanization, Ridley Scott

Trasumanar significar per verba
non si poria; però l'essemplo basti
a cui esperïenza grazia serba.[1]
Dante, *La Divina Commedia*

The utopian projects for transforming the human being which have given new life to Dante's neologism *trasumanar* could be summed up in two different and, in fact, contradictory ways. On the one hand, we could say that the human being knows itself to be an animal, but it *wants* to be human. The divine appears as the horizon of this desire exemplified by Greek tragedy at the meeting point of the invention of writing, democracy, and theatre. (Pierobon 2008) On the other hand, this desire seamlessly transmutes into its opposite, into *not* wanting to be this animal tragically desiring to be human. Ergo, the human being is the being which *does not want* to be human. The robot emerges on this end of the process as the result of the subtraction of unwanted humanity; the fantastic and science fiction being the relevant genre exempla.

The human being is the being that wants/does not want to be human. The being is not human but wants to be one; wanting is what makes it human. The being is human but does not want to be one: not wanting is what makes it human. The human is made by both wanting and not wanting to be human, which, consequently, it never is and thus, for this very reason, it is. The paradox comprises overlapping perspectives: ontological, ethical, aesthetic, genre-related, psychoanalytic, etc. A historical dimension might also be at work (e.g. from ritual to technology, from tragedy to science fiction) which would make us seek out a moment in time when the human as wanting to be human had been reversed into the human declining to be human. But then again, perhaps there never was such a moment; perhaps both operations were always at work. What matters is the non-coincidence, the gap, the refusal to accept the existence of some human nature. To put it differently, parallelly to the metaphysical and, from a certain point on, sociological, economical and polit-economical tradition, which is founded on notions of human nature (Marx also seems to be doing it in his early work, although a more careful reading would show that this nature in need of emancipation is in fact *not a given*) there is another tradition according to which the human has no nature of its own or, to put it in Pico della Mirandola's words, "no fixed seat or form." (Della Mirandola 2012, 117) One is not born a woman, runs Simone de Beauvoir's famous dictum, but one is not born hu-

[1] In A.S. Kline's translation, "To go beyond Humanity is not to be told in words: so let the analogy serve for those to whom grace, alone, may allow the experience." (Dante, *The Divine Comedy*)

man either. One becomes human: the human being happens *at the second step*.

Contrary to beliefs in the unprecedented novelty of the revolution of transhumanization, this process would seem to be co-extensive with humankind per se. On the other hand, theoreticians of animal studies would point out that animals also keep changing and evolving; they do not have a "fixed form" either. What this text is concerned with, however, is the human being as taking place at the second step; the coincidence of wanting and not wanting to be human as conductive to the happening of the human which seems to have never had as yet happened.

The Quadrilateral of the Human

Dante introduces his neologism in the First Canto of "Paradise." This is most appropriate in so far as, in the wake of "Inferno" and "Purgatory," "Paradise" will unfold the anagogic part of the poet's journey, the part concerned with mystical elevation and transcendence of the human limitations. Such a thing cannot be expressed, Dante observes, it can only be experienced. The new word is thus born from the necessity to name something which is, strictly speaking, beyond the reach of human language. The neologism, however, is also exemplified. The example is taken from Ovid's *Metamorphoses*, a work written some thirteen centuries prior to Dante's *Comedy*. Dante compares his experience to the metamorphosis into a sea god of Glaucus, a common fisherman (Ovid 2000, XIII: 898-968). Having tasted some magic herb, Glaucus is filled with yearning for the vastness of the sea, purified of his humanity, altered in body and mind, and turned into an immortal companion of the sea gods. This parable is meant to illustrate the ineffable experience of Dante's upward transformation which is set into motion by his gazing at his angelic mistress Beatrice while she herself is gazing at the divine light.

In Ovid's poem, however, Glaucus's metamorphosis is ripe with ambiguities. To begin with, he tells the story of his deification to a girl with whom he has fallen in love. In this way he tries to reassure her that he is "no freak or wild creature, but a god of the sea." He does look sort of freakish, though, and the girl understandably is not impressed either by his "dark green beard [...] hair that sweeps the wide sea [...] legs that curve below into a fish's fins," or by his desperation: "What use is it to be a god, if these things do not move you?" (Ovid 2000, XIII: 898-968) The continuation of this ill-fated wooing is in the direction of outright bestiality: the girl, Scylla,

> comes, wading waist deep into the pool, only to find the water around her groin erupt with yelping monsters. At first, not thinking them part of her own body, she retreats from their cruel muzzles, fears them, and pushes them away: but, what she flees from, she pulls along with her, and, seeking her thighs, her legs, her feet, in place of them finds jaws like Cerberus's. She stands among raging dogs, and is encircled by beasts, below the surface, from which her truncated thighs and belly emerge. (Ovid 2000, XIV: 1-74)

Ironically, then, in order to describe transhumanization as a shift whereof an angelic woman leads a man towards celestial love, Dante evokes a story in which the courtship of a beastly male deity leads to the transmutation of a young girl into chthonic monstrosity with the jaws of hell's dogs gaping between her thighs (and eventually, she is turned into a rock, something inanimate). It is as if transhumanization, understood as a thrust towards the divine, *has to* lay bare the turbulent border between human and beast (note the division of Scylla's body into what is above and below

the water), which is internal to this process.

Dante's neologism hence inadvertently reveals the animal lurking in the dazzle of transhumanization: the human-divine aspiration uncovers its placement into a triangle with the animal. There is a fourth side, however: the machine. It might look like a much later addition to the dynamics of the human yet the various autonomous mechanisms (*automatoi*) in Homer's poems; Hesiod's myth of Pandora as the first woman which might very well be claimed as the myth of the first robot, etc. make this technological side as venerably ancient as the other three. Nevertheless, it is with romanticism that the human dramatically crystalizes in a quadrilateral including the machine. The backdrop to this crystallization is the romantic transhumanizational *élan*: the conviction that, as Friedrich Schlegel famously put it, "the need to raise itself above humanity is humanity's prime characteristic."[2] Or, to put it once again, (not) wanting to be human is the characteristic of the human.

Against this background, some crucial literary works appeared whose impact was magnified through their fictional progeny but also through the mediation of philosophy, psychoanalysis, and other arts, including, when they came into being, cinema and video games. In 1810 Heinrich von Kleist's dialogue "On the Marionette Theatre" (Kleist 1994) positioned squarely the human as the disbalanced and disbalancing rank between the grace of the creatures without consciousness (the marionette but also the animal exemplified in this text by the sword mastery of a bear) and the grace of absolute consciousness (God). In 1816 E.T.A. Hoffmann's "The Sandman" appeared problematizing the dividing line between human and automaton. (Hoffmann 1979) In the same year Mary Shelley started her work on *Frankenstein, or the Modern Prometheus*, turning the myth of humanity's artificial children into the myth of the modern age. (Shelley 2013)

In view of the Cartesian (in fact, Aristotelean) equation between animal and automaton what the romantics did was launch the autonomization of the automaton, which from that point on has accrued a formidable fictional and philosophical dossier. The fascination exerted by the automaton's "angle" of the quadrilateral may have something to do, however, with the different dynamic of its interaction with the human.

Desire/drive

The quadrilateral of the human involves two modes: one founded on desire, the other one – on the drive. In the first mode, the human appears as the unattainable object of desire. This is a tragic mode: the animal desires to be human, the result is sacrificial death, the dazzlement of the sublime. In the second mode it pops up unforeseeably and, so to say, with a too-muchness, as a Doppelganger. The result is laughter (comedy) or horror (the uncanny). The human being discovers s/he is reduplicated by an automaton of some sort, which (like the animal) wants to be human and thus turns into a threatening or comic double, an obsessed rival, a usurper of the human.

The first operation is metaphysical. Giorgio Agamben's *The Open: Man and Anima*l (Agamben 2004) offers an elaboration of its workings or, rather, an elaboration of its inoperativeness. The discussions of Antigone's "pure" (in the Kantian sense) desire in Lacan and his commentators (as in Zupančič

[2] "Es ist der Menschheit eigen, dass sie sich über die Menschheit erheben muss." (Friedrich Strack and Martina Eicheldinger, eds. 2011, 85).

2000, 57-58; Zupančič 2003, 171); Franc Pierobon's analysis of the human at the crossroads of writing, theatre, and democracy; and, more generally, the anthropological interpretations of sacrifice mark the coordinates of this – no longer active, according to Agamben – "tragic humanity."

The second mode is technological and might seem totally new. The fantasy of mechanisms that come alive and the fascination with artificial creatures is not new, of course; what appears to be comparatively recent – beginning with Romanticism – is the horror they inspire (which may topple over into comedy as the film *Young Frankenstein* brilliantly demonstrates). The appearance of the human in an uncanny or comic redoubling with the machine can be approached theoretically through the study of the Doppelganger and the object *a* by the Ljubljana Lacanian School (as in Zupančič 2008) although these philosophers would probably not accept my transmodal[3] application of their ideas to the gap between human and robot.

Ultimately, what might be the truly novel development is the very shift of the "anthropological machine" (Agamben) producing the human from the desire of differentiation apropos the animal towards the need to come to terms with the dangerous rival, the machine. This shift inescapably produces a sense of brotherhood with the animal qua "organic" vis-à-vis the artificial creature.

Metamorphosis, subtraction, montage

In terms of their dynamic, desire tends to be metamorphic while the drive produces splitting, subtraction, and assemblage of parts. Glaucus, full of yearning for the sea expanse, is metamorphosed into this creature whose legs curve into fins: in comparing his experience to Glaucus', what Dante ultimately finds is transformation qua process, not its concrete content, which could be towards the divine (Beatrice) or beastly (Scylla).

Frankenstein, however, stitches together his Monster from pieces of corpses: his ambition to be like a god confronts him with a too-muchness which he has not foreseen. In "The Sandman," Nathanael realizes his beloved is an automaton when he sees her taken apart by her makers. Later on, in 1886, Auguste Villiers includes in his novel *Tomorrow's Eve* (Villiers 2001) a long and meticulous dissection, on an operating table, of the various parts comprising the android (a female one, an *andreide*).

Going back to Descartes' conception of animals (and the human body) as automata, one could see the fictional life of the artificial creature as the result of a splitting, a subtraction, an emancipation or, as already mentioned above, an autonomization of the automaton. The automaton separates from the creature it moves; it acquires an independent existence. This subtraction of the mechanism from the living thing has frequently been represented quite graphically: in Stanislaw Lem's novella "The Mask" (Lem 1992; originally published in 1976) the synthetic protagonist stands in front of the mirror and makes a delicate cut in her female body allowing a huge metallic bug to appear which is "her again." A more recent example would be Alex Garland's film *Ex Machina* (Garland 2015) where this scene is itself split: the robot Kyoko shows to the human protagonist Caleb the wires under her human-looking skin; terrified, Caleb stands in front of the mirror and makes a cut

[3] "The transmodal idea is the bare descriptive ingredient of a scientific idea, which, in its "purified" logical form, is reproduced in heterogeneous contexts; it transgresses the boundaries of scientific theories." (Kolarov 2009, 221, my translation)

from which blood begins to trickle. However, is blood proof enough he is not a machine fulfilling an alien program, a plaything to Kyoko's maker who happens to be his boss?

Ridley Scott's initial *Alien* (Scott 1979) is especially interesting in its enactment of the post Cartesian subtraction. The alien creature, which violently separates itself from its human hosts, using them for its reproduction and destroying them in the process, is described as "the perfect organism... I admire its purity... a survivor unclouded by consciousness, remorse, or delusions of morality." This admiration is articulated by Ash – duly broken into pieces at this moment, with white goo oozing from his entrails, exposing his android nature to the unsuspecting humans. The artificial creature (Ash) is thus revealed as the aspiring counterpart to the subtraction of the perfect organism (the alien bursting out of human bodies) from the paraphernalia of the human (consciousness, remorse, delusions of morality). The film conceptualizes the kinship between the artificial creature and the "perfect organism," i.e. the equation between mere organism and automaton in Descartes' sense. This complicity, moreover, is backed up in the story by the "Corporation," which, as it turns out, was directing the situation all along: a certain social order placing profit above anything is hence critically examined as effecting the collusion of organism and mechanism. The human, on the other side, survives in a woman (Ripley played by Sigourney Weaver) and a cat. This alliance is also indicative of the contemporary tendencies mentioned above: in its effort to differentiate itself from the robot, the human shifts in the direction of the animal.

The sequels to *Alien*, which were not directed by Ridley Scott, worked through various re-articulations of the human quadrilateral. *Aliens* (1986) moved in the direction of technology: Ripley is supported by highly trained military professionals; she prevails by expertly handling machines, including a transformer which turns her into a sort of cyborg; the android Bishop is a nice guy and his inevitable falling apart does not put an end to his obliging usefulness; the cat is replaced by a smart little girl. *Alien3* goes in the opposite direction towards bestiality: almost no technology; "double y" male criminals comprise Ripley's team; for the first time an animal (a dog) becomes the victim of the alien which is deprived of its uncanniness and compared to a lion; the android is broken and thrown in the garbage from the start. Religion appears for the first time in the series, making up for the absence of the divine side in the previous versions (the criminals have been transformed by faith), and, for the first time, Ripley dies sacrificing herself...

The most interesting of these sequels *Alien Resurrection* (1997) makes a decisive step towards capturing new developments in the thinking of transhumanizaton. It is not a question only of introducing biotechnology, in-vitro, cloning, comically vicious scientists and gruesome laboratories, etc., which, indeed, it does. More importantly, subtraction has taken a different direction: Cal, the only android in the series to survive to the end more or less intact (well, with just a little hole oozing the white goo) is a delicate girl guided by compassion, sense of justice, and desire to protect humanity. What the artificial creature has subtracted from the human is not the "perfect organism" but, precisely, the "clouding" of conscience and morality. As Ripley, no longer quite human herself, tells Cal, "I knew you were too humane to be human. "[4] The change in the operation of subtraction as exemplified by Cal is juxtaposed with processes of hybridization and metamorphosis which are practically absent in the earlier films: Ripley has acquired the alien's exceptional physique while the alien queen has acquired a human reproductive system and gives birth to a hideous mongrel with

[4] A separate study could be made on the way the sequels quote and exchange definitions of what is "perfect" and what is "human."

deep sorrowful eyes, pathetically mingling monstrosity and infantility, aggression and supplication… The questioning as to what is human is thus shared by the augmented Ripley who no longer wants to be human and the robot Cal who wants to be human…

Still, none of these sequels preserves the sharpness and the parabolic elegance of Ridley Scott's *Alien* in posing the question of the human up and against the perfect automaton: a question which he has meanwhile forcefully re-imagined in *Blade Runner* (1982) where the artificial creatures are represented as both more perfect qua automata and more humane qua tragic search for their maker. When Scott returns to his alien with *Prometheus* (2012) and *Alien: Covenant* (2017), he does so, whatever the artistic merits of these films, in order to restore conceptual rigour. To begin with, the "perfect organism" turns out to be a machine, after all: it is not the alien, it is the aliens' weapon! Scott thus puts an end to the degradation of his uncanny monster into some sort of very dangerous animal and reiterates the post-Cartesian autonomization of the automaton. The second move is to introduce squarely – perhaps too squarely – the angle of the divine, which figures only through its conspicuous absence in *Alien* but is already an important aspect of *Blade Runner*. For Scott, the horizon of the divine could be summed up by William Blake's verse "Dost thou know who made thee?" Asking, accepting the not knowing and still asking seems to be, with Scott, the properly humane thing. This is precisely where things go wrong when one of the robots, David, turns into an aspiring god: in the course of *Prometheus* and *Alien: Covenant*, David does away with all humans, aliens, and, indeed, animals in order to clear his way as divine creator. This move rests on the irony of faulty Nietzschean reasoning: humans do not know who their maker is; I, robot, know who my maker is; I kill the maker, I am the maker…

The problem with David is that he is… human, too human. His Promethean hubris is too human, his enactment of Cain versus Abel (he kills the obedient robot Walter) is too human; his taste for Renaissance art and Romantic poetry and music (*Alien: Covenant* begins and ends with Wagner's *Entry of the Gods Into Valhalla*) is all too human. Placing a conceited artificial being which is *that* human - with all his evil strategizing and confusing Byron with Shelley - in the angle of the divine cannot help but produce a comic effect. Nevertheless, it is indicative of an important new trend.

Deus e(s)t machina

The quadrilateral of the human and the processes of subtraction/montage and hybridization/ metamorphosis which inform its dynamic have their distinct historical dimensions. They are inescapably marked by the scientific and technological aspirations of the concrete epoch and bear witness to its philosophical, political, and social dilemmas. Two somewhat paradoxical tendencies characterize the "A.I. party" [5] of the new millennium. There is, to begin with, the usurpation of the place of the divine by the machine – not just in the rather comic mode of Ridley Scott's robot David but in a manner which explores the implications of artificial intelligence in what seems to be its limitless potential as memory storage, data handling, and control over material processes. The vastness of this potential and the impossibility for an individual human mind to contain it have given rise to quasi divine and mystical representations of the machine.

A huge three-part epic science fiction video game, *Mass Effect* (BioWare. 2007, 2010, 2012) may

[5] Alex Garland apropos his *Ex Machina*: "Among filmmakers there was an A.I. party going on, to which we were late." (Garland 2015)

illustrate this point. The plot of the game unfolds the conflict between an alliance of advanced galactic civilizations and an enigmatic league of evil machines called the Reapers which are bent on destroying those civilizations. At some point the human protagonist Shepard finds a device, which initiates contact with Sovereign, a representative of the Reapers. Touching the device, Shepard is flooded by the machine's hundreds of thousands of years of memory from prior "organic" civilizations. This experience overwhelms him (or her, depending on the choice of the player) and literally throws her on her knees in a sort of mystic vision. A dialogue ensues with the machine proclaiming its own eternity and divine all-mightiness. It addresses Shepard and her entourage as "rudimentary creatures of flesh and blood." It announces that it is "the vanguard of [their] destruction." It decrees that "the cycle cannot be broken." The machine, hence, appears as the incarnation of a divinity which is unsympathetic, relentless, and disdainful of organic life, forever condemning it to annihilation before it reaches its apex; and the plot of the game is driven by the "organic" revolt against pre-determination and mechanical repetition. From something we create and something that rebels against us to destroy us, which was the Romantic legacy of the artificial creature, the machine seems to have moved on to usurp the place of divine sovereignty. While this rebellion against the "laws of nature" might not be completely new in itself, it certainly has acquired a novel urgency vis-à-vis the question of the human up and against present day technological developments and the anxieties that accompany them.

The second tendency might be seen as compensatory with regards to this deification of the machine. Having free will, being able to love, possessing the aptitude for empathy, or for artistic creation, have provided the usual reservoirs for the human difference against competing robots. Imaginatively, none of these seems to work as they used to. In recent years, the capacity to conceive and give birth naturally has taken precedence in defining humanity. The robots who *want to be human* need to be able to give birth: this goal drives four seasons of persecution and galactic disasters in the TV series *Battlestar Galactica* (Moore 2004-2009) and constitutes the major conceptual difference between *Blade Runner 2049* (2017) and the original *Blade Runner* where being able to love still sufficed. *Blade Runner 2049* adds some finer touches: not so much being born from a body as having childhood memories; not so much having such memories as being able to lose them the way a child has to lose its (initial fusion with) mother on its way to becoming a subject… In the face of technological developments which make the natural part in the development of the embryo progressively smaller, this tendency raises a plethora of questions. One thing stands out, though. From Frankenstein to Ridley Scott's heartless scientists, robots used to be male creations. Today, they want their mother.

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Dr Žarko Cvejić

FROM MEN TO MACHINES AND BACK: AUTOMATA AND THE RECEPTION OF VIRTUOSITY IN EUROPEAN INSTRUMENTAL ART MUSIC, C. 1815–C. 1850

In music history textbooks, discussions of the period between the Congress of Vienna and the failed revolutions of 1848 usually include at least a subchapter on virtuosi and virtuosity; for instance, that is the case with such disparate sources as Carl Dahlhaus's *Nineteenth-century Music* and Richard Taruskin's *Oxford History of Western Music*, a couple of textbooks separated by over 20 years. That is because in European art music, those years were, among other things, indeed an age of virtuosi and virtuosity: benefitting from a rather fortunate constellation of social, political, historical, and economic factors,[2] virtuosi, typically violinists and pianists such as Paganini, Liszt, and a host of their today lesser known rivals, crisscrossed Europe and even the Americas, bedazzling their audiences from Lisbon to Moscow, Dublin to Istanbul, and Boston to Buenos Aires.

One of the socio-historical factors that enabled this was the rise of the musical press around 1800—the first major music periodical, the Leipzig *Allgemeine musikalische Zeitung*, which survived for decades and influenced the structure and organisation of all subsequent music periodicals, was founded by Friedrich Rochlitz in 1798 and soon followed by equivalent publications in France (François-Joseph Fétis's *Revue musicale*, 1827), Britain (*The Musical World*, 1836), and other countries.[3] The rise and growth of journals such as these, fuelled by the upper and especially middle classes' newly found interest in music, provided unprecedented space for music criticism, which is another factor that made the 1830s and '40s an age of virtuosity. A lot of the time, music critics celebrated virtuosi as (almost) superhuman figures who pushed the limits of human accomplishment in music performance. Thus, for instance, the Moscow correspondent of the *Allgemeine musikalische Zeitung*, described Liszt's concerts in Russia's old capital as no less than a "rightful triumph of art and humanity".[4] Typically, virtuosi were celebrated as heroes, gods, Caesars, Napoleons, and other such figures larger than life, whether from history or from mythology. According to Richard Leppert and Stephen Zank's interpretation, this was because they were "the literal embodiment of extreme individuality", the new bourgeois subject of 19th-century Europe—bold, enterprising, daring.[5]

But they were also criticised, sometimes even severely, with open hostility, in Leppert and Zank's interpretation, whenever they disregarded "the demands of bourgeois decorum, reserve, and respectability".[6] In fact, critics scolded them for a variety of perceived iniquities, including "charlatanry", a favourite criticism roughly referring to using non-musical means, such as fancy dress, bizarre behaviour, and the like, as well as musical effects perceived as cheap, such as "meowing" on the violin or adding octaves on the piano, to impress audiences; disrespecting the works they performed, especially when those works came from the then-emerging musical canon (e.g. works by Beethoven), by "embellishing" and violating them in other ways; and, last but not least, for playing "like (musical) automata". That last point of criticism forms the focus of this essay.

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[2] Including the return of political stability in Europe following Napoleon's final defeat in 1815, which re-enabled crossborder travel; the development and spread of railways, which, for the first time, enabled safe and relatively fast transportation of people, goods, and information across vast distances; the rise of telegraphy, which, again for the first time in history, enabled instant communication across Europe and beyond; this socio-cultural background is discussed in detail in my study *The Virtuoso as Subject: The Reception of Instrumental Virtuosity,* c. *1815*–c. *1850,* Newcastle-upon-Tyne, Cambridge Scholars Publishing, 2016, 22–27.

[3] For more, see Cvejić, *op. cit.*, 27–38.

[4] F. G., "Nachrichten. Moskau", *Allgemeine musikalische Zeitung*, 28 June 1843, 478.

[5] Richard Leppert and Stephen Zank, "The Concert and the Virtuoso", in James Parakilas (ed.), *Piano Roles: Three Hundred Years with the Piano,* New Haven, Yale University Press, 1999, 259.

[6] *Ibid.*

On the surface of things, perhaps the appearance of automata in early and mid 19th-century critical discourse on virtuosity is not all that surprising, given how fascinated the middle and upper classes of Europe had been with automata already since the late 18th century—mechanical contraptions designed to mimic, more or less successfully, human and other living beings; for evidence, one need only look at contemporary European literature, for instance, the tales of E. T. A. Hoffmann, one of which is further discussed below.

However, the thesis of this article runs somewhat deeper: that the dismissals of (some) virtuosi as (musical) automata reveal a more profound anxiety about the presence of the human element in virtuosic music performances that were perceived as simply too virtuosic to issue from a human being, limited and imperfect as we tend to be. Further, I will also argue that this anxiety was related to the more general anxiety regarding the very possibility of free human subjectivity, a freely acting human subject, and of the possibility of freedom in general, which permeated European culture, especially philosophy and the arts, in the wake of the failed bourgeois revolution in France—the culmination of liberal Enlightenment thought in practice—and the restoration of repressive monarchical regimes throughout Europe. To support my claim, I will resort to contemporary aesthetics and philosophy, namely the paradigm shift in aesthetics occurring around 1800, from mimesis, or edifying imitation of nature, to expression, more accurately, the expression of what otherwise could not be expressed, namely the highest truths about man and the world surrounding him, as the task of all art and especially music, which helped raise music from its lowly status in Enlightenment aesthetics, most notably Kant's, to its apotheosis as the supreme art in the succeeding generation of thinkers, most notably Schelling, Schopenhauer, E. T. A. Hoffmann, and other early German Romantics. This also obliged them to claim aesthetic autonomy for music and the other arts—submitting to their innate laws and purposes only, disregarding all other concerns, such as social and other non-artistic functions. According to the powerful interpretation of British scholar of classical German philosophy Andrew Bowie, this paradigm shift was at least in part driven by the suspicion regarding free human subjectivity described above. Namely, art and especially music were reconceptualised as aesthetically autonomous and uniquely expressive as a symbol or model, if only a utopian one, of a similarly free human subject, if such a subject could exist. In contemporary criticism of virtuosity, this aesthetic paradigm shift was reflected in constant demands for *expressive* play, without ever clearly defining what exactly such playing should express. But I will argue that that was precisely in line with the more general aesthetic paradigm shift from mimesis to expression described above. Presently, I will begin by providing several examples from early and mid 19th-century criticism illustrating the observations made above and then proceed to interpret them in light of the shifts in aesthetics and philosophy that I just described.

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As I suggested above, virtuosi, especially the major ones, were often celebrated, with much exaggeration, as (re)incarnations of gods, demigods, and heroes from Greek and Roman mythology, and emperors, kings, and great generals from ancient, medieval, and more recent history. For instance, writing in 1839 for Robert Schumann's *Neue Zeitschrift für Musik*, a major music periodical in the German-speaking world and the main competitor of Gottfried Wilhelm Fink's *Allgemeine musikalische Zeitung*, an unsigned reviewer routinely described Sigismond Thalberg (1812–1871), a celebrated Austrian pianist based in Paris and Liszt's main rival on the virtuoso circuit until the latter's retirement in 1847, as no less than a "hero of pianism".[7] As for his chief rival, according

[7] Unsigned, "Lieder und Gesänge", *Neue Zeitschrift für Musik*, 1 February 1839, 69.

to an unsigned review published in the same journal two years later, harmonies spring from out of his hands "just like Minerva [sprang] out of Jupiter's head".[8] Similarly, reporting from Berlin on the pages of the *Revue et Gazette musicale de Paris*, the leading French music periodical of the 19th century, the influential critic Ludwig Rellstab likened the young Henri Vieuxtemps, the famous Belgian violinist then still in his teens, to "Hercules in the cradle".[9] The same journal repeatedly carried rhapsodic and somewhat even eroticised descriptions of Liszt as, in Heinrich Heine's words, "transported, thunderous, volcanic, fiery like a Titan".[10] In a somewhat later issue, the influential Parisian critic, violinist, and composer Henri Blanchard dubs Liszt "the Pompey, the [Mark] Anthony, the Moreau of the piano" and Thalberg "the Caesar, the Octavian, or the Napoleon".[11]

But, as I also suggested above, not all critics were impressed all the time. For instance, for an anonymous contributor to the London *Musical World*, the leading British music periodical at the time, all virtuosi were monsters and their recitals little more than freak-shows. It was mere curiosity that attracted people to them: "does the innate love and admiration we feel for the beautiful in nature deter us from crowding to gaze upon some two-headed or three-legged monster which may be exhibited in our city? And is it to be inferred, that because we go to see it we find it more lovely and agreeable than the graceful and symmetrical being which we are accustomed to regard as beautiful? It is our thorough knowledge of the beautiful which makes us keen in our perceptions of the ugly and monstrous. We are led to monstrous productions of nature by curiosity, and the same feeling prompts us to listen to these monsters of art".[12] The topic of this essay concerns a special variety of those monsters of art: the "automata" virtuosi. For instance, that is how Paris-based Austrian pianist Henri (Heinrich) Herz, only 17 at the time, fared in an 1820 report written for the *Allgemeine musikalische Zeitung*. The author of the report, composer and violinist Louis (Ludwig) Spohr (1784–1859), begins by acknowledging Herz's "extraordinary skill" as "astonishing", but accuses him, as well as other Parisian virtuosi, of putting technical ahead of intellectual training. It is easy to see, he continues, that all those pursuing such a path will end up with their own spirit dead and grow into "nothing better than musical automata".[13]

In a culture that increasingly had to contend, even in everyday life, with all sorts of machines, including trains, steamers, and, not least, pianos,[14] one could hardly expect contemporary music criticism to stay immune to the wholesale mechanisation of life beginning around 1800. It is therefore hardly surprising that we also find automata in many of these reviews. The important question here is how and why automata entered the critical discourse on *virtuosity* in the first place and how that reflects the larger issues, including philosophical, described above, that shaped that discourse. Automata were self-powered machines, which, when appropriately wound-up by a human operator, mimicked living beings, animal or human; and they were very popular in late

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[8] Unsigned, "Vermischtes", *Neue Zeitschrift für Musik*, 12 April 1841, 122.

[9] L. Rellstab, "Correspondance particulière. État de la musique à Berlin", *Revue et Gazette musicale de Paris*, 24 June 1838, 263–64.

[10] Henri Heine, "Lettres confidentielles. II", *Revue et Gazette musicale de Paris*, 4 February 1838, 43.

[11] Henri Blanchard, "Soirée de musique sacrée chez madame la princesse de Belgiojoso. Matinée musicale donnée par M. Liszt", *Revue et Gazette musicale de Paris*, 26 April 1840, 284. Jean Victor Marie Moreau (1763–1813) was a renowned French republican general.

[12] H. G., "Letters from Vienna", *The Musical World*, 21 March 1846, 132–33.

[13] Louis Spohr, "Briefe aus Paris von Louis Spohr. Zweyter Brief, den 31sten December 1820", *Allgemeine musikalische Zeitung*, 7 March 1821, 156–62.

14 Concerning the piano as the most machine-like of instruments, James Parakilas has written: "The piano is a machine. Already when it was invented at the beginning of the eighteenth century, it embodied a more complex mechanism than any earlier stringed instrument"; "A History of Lessons and Practicing", in: James Parakilas (ed.), *Piano Roles: Three Hundred Years of Life with the Piano*, New Haven: Yale University Press, 2001, 115.

18th- and early 19th-century Europe, from Jacques de Vaucanson's "duck" and "flautist"[15] to Johann Nepomuk Maelzel's "chess-player", which, although really a piece of fraud, achieved global fame.[16]

However, as Catherine Liu explains in her study of pre- and early-Industrial Age automata and their contemporary reception, those machines also had a powerful destabilising effect, because the more convincing among them seemed to suggest that the difference between the human and the mechanical may not be as obvious as it seems, a difference of degree rather than essence: "Man can be *like* a machine and a machine can be *like* a man. In this kind of comparison, a relationship of analogical rather than absolute difference is established between what man (or human) is from what he is not".[17] In other words, if an inanimate machine could be made to imitate real living beings so closely that it grew difficult to distinguish between an automaton and a living organism, how could one rest assured that what appears as living beings are not likewise mere mechanisms, without immaterial souls to animate them? That this was precisely the fear that tormented the citizens of the unnamed university town in E. T. A. Hoffmann's famous story "The Sandman" suggests just how deeply present automata were in the culture of early 19th-century Europe, in a variety of fields, including mechanical engineering, fine literature, and music criticism.[18] If a mechanical simulacrum could approximate its organic original so much that they became indistinguishable, how could one rest assured that the original is organic and, moreover, that it is really the original? Then it may all come down to a soulless, self-animating mechanism; there might be no such thing as the immaterial soul, just a jumble of pulleys, cogs, and wheels.

[15] A facsimile of Vaucanson's original treatise, with detailed descriptions and diagrams of his automata, is available in Jacques de Vaucanson, *An Account of the Mechanism of teh Automaton or Image Playing on the German Flute (1742) / Le méchanisme du fluteur automate (1738)*, ed. David Lasocki, Buren, Fritsh Knuf, 1979. Vaucanson's flute-player is also briefly discussed in Penelope Mathiesen, "Jacques de Vaucanson's Mechanical Flute Player", *Continuo: The Magazine for Old Music*, 1992, 16.6, 6–8.

[16] Tom Standage's book *The Mechanical Turk: The True Story of the Chess-playing Machine that Fooled the World*, London, Allen Lane, 2002, is an amusing and informative history of the chess-player and other automata. Additional information on musical automata and their histories can be found in Adelheid Clara Voskuhl, "The Mechanics of Sentiment: Music-playing Women Automata and the Culture of Affect in Late Eighteenth-century Europe", doctoral dissertation, Cornell University, 2007; David Toop, "Humans, Are They Really Necessary? Sound Art, Automata and Musical Sculpture", in: Rob Young (ed.), *Undercurrents: The Hidden Wiring of Modern Music*, London, Continuum, 2002, 117–29; and Roland Carrera, "Androids", *FMR* 1984, 6, 75–87.

[17] Catherine Liu, *Copying Machines: Taking Notes for the Automaton*, Minneapolis, University of Minnesota Press, 2000, 78–79.

[18] E. T. A. Hoffmann, "The Sandman", in: *Tales*, New York, Continuum, 1982, 305–306: "The story of the automaton had very deeply impressed them, and a horrible distrust of human figures in general arose. Indeed, many lovers insisted that their mistresses sing and dance unrhythmically and embroider, knit, or play with a lapdog or something while being read to, so that they could assure themselves that they were not in love with a wooden doll; above all else, they required their mistresses not only to listen, but to speak frequently in such a way that it would prove that they really were capable of thinking and feeling. Many lovers, as a result, grew closer than ever before; but others gradually drifted apart. 'One really can't be sure about this', said one or another. At tea parties, people yawned with incredible frequency and never sneezed, in order to ward off all suspicion. Spalanzani, as has been noted, had to leave the place in order to escape criminal charges of having fraudulently introduced an automaton into human society". For my purposes here, it is symptomatic that Nathanael, the main protagonist of the story, mistakes the wooden doll (automaton) "Olympia" for a real, living girl and falls in love with her at the moment when he hears "her" sing and play the piano, as any respectable bourgeois girl ought to do. One might perhaps understand Nathanael's mistake given that voice has long been theorised as the most faithful sign of human (self-)presence, most notably by Jacques Derrida. As for "Olympia's" other feminine accomplishment, it is worth noting that Hoffmann makes sure to tell us that her piano-playing was "too perfect", like that of a virtuoso. For discussions of this and other stories by Hoffmann involving automata, see Wilhelm Seidel, "Olympia: Über die Magie der Herzlosigkeit", in: Jörg Jochen Berns and Hanno Möbius (eds.), *Die Mechanik in den Kunsten: Studien zur ästhetischen Bedeutung von Naturwissenschaft und Technologie*, Marburg, Jonas, 1990, 201–12; Emily Dolan, "E. T. A. Hoffmann and the Ethereal Technologies of 'Nature Music'", *Eighteenth-century Music*, 2008, 5.1, 7–26; and Katherine Maree Hirt, "When Machines Play Chopin: Musical Instruments and the Spirit of Musical Performance in Nineteenth-century German Literature", doctoral dissertation, University of Washington, 2008.

As Spohr's review of Henri Herz shows, the danger for virtuosi was that in their quest for perfection in performance, they might come to be likened to, and dismissed as, automata, lifeless machines, rather than celebrated as extraordinary human individuals who push the limits, as virtuosi were supposed to do, of the humanly possible.[19] A virtuoso was obliged to pursue perfection, especially technical perfection, as a defining characteristic of virtuosity; but he also had to make sure that his accomplishment, however extraordinary, remain recognisable as that of a human being. A virtuoso had to be perfect, but *humanly* perfect, not *too* perfect, like a machine; he was required, perhaps, to display an almost superhuman level of virtuosity, but still to come across as a human being, not as a machine. That was the whole point: a seemingly superhuman level of accomplishment in a mere human being. Otherwise, the magic was lost and his apparently superhuman achievement might be explained away as that of a machine, an automaton. That is arguably what happened to Herz and many others in reviews such as the one quoted above: to put it simply, they played too virtuosically, too perfectly, for a human being; their tempi were too fast, their chords too dense, their leaps up and down the keyboard and the strings of the violin too wide and daring, and yet too perfect.

But if playing virtuosically or, perhaps, too virtuosically meant risking being dismissed as a human automaton, how could virtuosi remain in business *and* avoid such a fate? Was there a way for them to keep playing virtuosically but still be recognised as human, if not superhuman? The answer is yes and, according to many contemporary reviews, the correct way was to play *expressively*, whatever that actually meant, which was, as I show below, far from clear. Presumably, even a machine, one of Maelzel's or Vaucanson's automata, such as the latter's flute-player, could provide a "correct" rendering of a piece of music, correct in the limited sense of playing all the right notes at all the appropriate times. But only a human being could breathe life, as it were, into the piece, playing it correctly but differently every time, and expressing something beyond those notes as they appear in the score, something perhaps otherwise ineffable, something that only music might express. But more on that below; now we must again turn to some examples from contemporary criticism of virtuosity. For instance, in a review from 1843, an anonymous contributor to the *Allgemeine musikalische Zeitung* asserts that only "genuine artists" among modern virtuosi "are allowed" to transcend the "merely sensuous", owing—crucially—to the power of "the driving force of expression". [20] But such genuine artists are rare, the reviewers tells us, because most virtuosi are entirely self-absorbed, with their little celebrity cults, only too ready to degrade musical performance into "finger-art" (*Fingerkunst*) and "handiwork" (*Handwerk*). Two years later, writing for the same journal, a reviewer signed only as "L. R." commends the Bohemian composer-pianist Ignaz Moscheles (1794–1870) for the "*humanity* of his execution" [emphasis mine], which comes straight out of his soul and "will always win him the hearts and appreciation" of every audience.[21]

[19] There is a related, though brief, discussion of this predicament of virtuosity in Marie-Louise Mallet, "La Virtuosité: Ou le jeu par excellence…", in Michelle Biget (ed.), *Musique, sons et jeux*, *Les Cahiers du CIREM*, 1990, 16–17, 51–61. In "A History of Lessons and Practicing", Parakilas provides an intriguing reading of 19th-century piano pedagogy, arguing that "it was not until the nineteenth century (which was called the Machine Age even at that time) that the ideal of the machine was extended to the way the piano was played—or more precisely, to the way people were taught to 'play it'" (Parakilas, *op. cit.*, 115–16). Klaus Giersch has argued that the didactic method of the famous Austrian piano pedagogue Carl Czerny was inspired by the industrial division of labour; see Klaus Giersch, "'Der kranke Arm und die Toccata': Robert Schumann und das Klavier", *Das Orchester: Zeitschrift für Orchesterkultur und Rundfunk-Chorwesen*, 1992, 40.5, 594–601.

[20] [Unsigned], "Nachrichten. *Wiener Musikleben*", *Allgemeine musikalische Zeitung*, 9 August 1843, 586–87.

[21] "…die Humanität seines Vortrages wird ihm stets die Herzen und grosse Anerkennung gewinnen"; L. R., "Nachrichten.

What is symptomatic here is the reviewer's choice of "humanity" as the most pertinent way to characterise Moscheles's "soulful" and "expressive" style, as though "expressive" (whatever that really meant) play was somehow proof that the virtuoso is indeed human.

Some reviewers were even willing to turn a blind eye to deficiencies in technique, if a virtuoso's performance was considered expressive enough. For example, an unsigned correspondent of the *Allgemeine musikalische Zeitung* from St. Petersburg showed such benevolence in a review of Bohemian violinist Heinrich Ernst's (1812–1865) tour of Russia's imperial capital of 1847.[22] Comparing Ernst with the Belgian violinist Vieuxtemps, already mentioned above, the reviewer states that both of them are "great, extraordinary virtuosi", though differing in their accomplishment and aspirations. Viextemps's technique is perfect; and yet, he lacks some of that "innate warmth", which, "coming from the heart, captures the heart of the listener"; however, no one should reproach him about this, since it is "a free gift from God and cannot be learnt through any amount of study". By contrast, Ernst, even if his tuning is occasionally less than perfect, has that "warmth of feeling, rapture, and originality that no study but only nature can give". Although Ernst, too, must have devoted much time to diligent practice, the reviewer continues, "this was limited by a spiritual tendency, which saved his virtuosity from that one-sided, cold perfection, which causes amazement because it approximates an art-machine [*weil sie an eine künstliche Maschine erinnert*], but cannot capture the heart". That is why "*Vieuxtemps* is a virtuoso and composer par excellence, but Ernst is an artist par la grace de Dieu".

Several years before, on the pages of the London *Music World,* Ernst was similarly compared to Camillo Sivori (1815–1894), an Italian violin virtuoso and Paganini's only pupil whom the Genoese master recognised as such. This time, too, Ernst came out on top, again on account of his expressive play: "Sivori possesses a command of his instrument almost unlimited; a fine, broad, free, and open style of playing; great brilliance and finish of execution, and a softness of manner that is not by any means without its powers of captivation. Ernst has, no less than he, the capability to *express* upon the violin the uttermost caprices of the wildest fancy; and he also has, far more than he, a fancy, quick, brilliant, and imaginative, to suggest the most delicate, refined, and passionate *expression*, which he pours out from his instrument with the enthusiasm of an author, rather than with the mechanical accuracy of a mere performer [emphasis mine]. … Ernst, in his performance, seems to open the extremest depths of passion, and to expose the acute, strong, and impulsive workings of a musician's heart, while Sivori evinces only the superficial gallantries of art, and captivates rather than commands our feelings, by the fascination of his graceful demeanour; in short, … Sivori is a *fine player*, Ernst is a *great one*!"[23] On other occasions, too, *The Musical World* lavished praise on Ernst, almost always invoking his *expressive* playing: "Ernst is our violinist *de cœur*—he has that within him which surpasses show—he is a great artist, and his devotion to music is as unmistakeably great as any of the qualities which we have so frequently found occasion to laud in him as a mere violinist. He plays the fiddle, certainly—and right ably he plays it,—but he *feels* something far beyond it—and *he expresses what he feels*".[24]

So it seems that expression or expressive performance was that missing ingredient in "automata"

Leipzig", *Allgemeine musikalische Zeitung*, 8 January 1845, 28.

[22] [Unsigned], "Nachrichten. St. Petersburg", *Allgemeine musikalische Zeitung*, 23 June 1847, 430.

[23] [Unsigned], "Sivori and Ernst", *The Musical World*, 10 August 1843, 268.

[24] Q., "Ernst", *The Musical World*, 11 July 1844, 227–28.

virtuosity, required as evidence of the presence of a human element in virtuosic performance. But *what* exactly were virtuosi meant to express? On that matter, the critics were—without exception—surprisingly enigmatic. Simply put, in the huge body of early to mid 19th-century criticism of virtuosity, including every issue of all the leading German, French, and English music periodicals published between 1800 and 1850, I could not find a clear definition of expression in musical performance or a clear explanation of what or how exactly an expressive performance should express or be expressive *of*. If pressed to come up with a definition or explanation of our own, most of us today would probably mention dynamics, phrasing, articulation, and the like, so defining or explaining expressive musical performance should not have been an impossible task. And yet, none of these critics, including some towering figures of music criticism and beyond, such as Schumann and Fétis, curiously remained silent on the matter. I suspect that there was a design to this, that they failed to define or explain expressive musical performance not out of ignorance or negligence, but deliberately, in order to preserve an ineffable human presence, an ineffable human core in musical performance, which could only be expressed *musically*, by means of music, in and through music, and not described, expressed, or communicated in language or by any other means. It just seems unlikely that such a glaring lacuna could appear in such a huge body of criticism by accident or neglect, and at that, by some of the leading authorities of 19th-century music criticism.

Besides, the absence of a clear definition of expressive musical performance in early to mid 19th-century music criticism would also fit in with the lack of a similar definition of expression in music in general, in other words, of an explanation of what exactly it is that music expresses. Indeed, when one arrives at a section marked *espressivo* in a sonata by Beethoven or a fugue by Bach, therefore, in a wordless piece of non-programmatic music, what exactly should one express at that moment? It is therefore with good reason that Andrew Bowie notes that "it is actually very hard to give the word 'express' a really productive sense".[25] And even though it was precisely late 18th- and early 19th-century aesthetics that inaugurated expression as the main task of all art and especially music, replacing mimesis or edifying imitation of nature, those very same thinkers likewise failed to provide a clear definition of expression in music or explanation regarding what exactly it is that music expresses. Their definitions and explanations, where they are offered at all, are at best rather general and often enigmatic, metaphysical. For example, according to E. T. A. Hoffmann, music "reveals to man an unknown realm, a world quite separate from the outer sensual world surrounding him, a world in which he leaves behind all feelings circumscribed by intellect in order to embrace the inexpressible".[26] According to his contemporary and fellow-early Romantic Wilhelm Heinrich Wackenroder (1773–1798), music "speaks a language which we do not know in our ordinary life, which we have learned, we do not know where and how, and which one would consider to be solely the language of angels".[27] In the view of Friedrich Schelling, the leading philosopher of this generation, music is "nothing other than the primal rhythm of nature and of the universe itself, which by means of this art breaks through into the world of representation".[28] In the aesthetic-philosophical system of his somewhat younger contemporary Arthur Schopenhauer, music "is as *immediate* an objectification and copy of the whole *will* as the world itself is", the Will being the only real or noumenal existence in Schopenhauer's metaphysics.[29]

[25] Bowie, *op. cit*., 27.
[26] E. T. A. Hoffmann, "Beethoven's Instrumental Music", in: David Charlton (ed.), *E. T. A. Hoffmann's Musical Writings:* Kreisleriana, The Poet and the Composer, *Music Criticism*, Cambridge, Cambridge University Press, 236.
[27] Wackenroder, *Phantasien über die Kunst für Freunde der Kunst*, in: Edward Lippman (ed.), *op. cit.,* 13.
[28] Friedrich Wilhelm Joseph Schelling, *Philosophy of Art*, Minneapolis, University of Minnesota Press, 1989, 31.
[29] Arthur Schopenhauer, *The World as Will and Representation*, Vol. I, New York, Dover Publications, 1969, 257.

Again, this failure to provide a clear definition of musical expression was hardly the result of ignorance or negligence on the part of these thinkers; rather, it was arguably the whole point: music expresses that which can only be expressed in music and in no other way, including language; therefore, it is impossible to *say* (in words) what music expresses, for it can only be put in music. This was in line with the wholesale loss of trust in language as a natural and faithful representation of reality, which permeated European philosophy from Kant's somewhat younger and lesser known contemporary and fellow Königsberger Johann Georg Hamann (1730–1788) and especially the famous early German Romantic Herder.[30] Music's purported ability to express the inexpressible, that which no other art or language could express, that which could not be expressed by any other means, is precisely what enabled its meteoric rise in stature in contemporary aesthetics and philosophy, from a merely "agreeable art" in Kant[31] to Schelling's "primal rhythm of nature". In Wayne Bowman's useful summary, expression is "both something music 'has' and 'does'", but only of itself and/or the otherwise inexpressible, which confirms its autonomy and is its chief virtue.[32]

That last line, concerning music's autonomy, brings us to the final segment of this essay and will return us to its beginning, its initial and main topic—the issue of the human element in virtuosic music performance. According to Andrew Bowie's compelling reading of German philosophy around 1800, outlined above, music was revalorised in this body of thought as (aesthetically) autonomous and expressive of the inexpressible in order to compensate for the lack of freedom and autonomy in real political terms, in the wake of the defeat of the French bourgeois revolution as the culminating liberal political project of the Enlightenment and the restoration of repressive monarchical regimes across Europe. In other words, music, now reconceived as aesthetically autonomous and uniquely expressive, was meant to provide a sensuous, though, perhaps, utopian model of a similarly autonomous, politically free and unique human subject.[33] As a philosopher of the Enlightenment, still beholden to Christian dogma, including that of man's freedom of choice, Kant had still believed in the free and rational subject of the Enlightenment; "Freedom actually exists", reads the opening sentence of his second *Critique*.[34] After all, it was his spiritual father Rousseau who wrote in *Social Contract* that "Man is born free".[35]

But deeply shaken by the experiences of the French Revolution, which seemed like the realisation of the Enlightenment liberal project, but then degenerated first into Robespierre's totalitarian terror and then Napoleon's dictatorship, followed by a catastrophic defeat and restoration of the Bourbons, the very next generation of thinkers, while Kant was still alive, began to doubt whether man is really born free, in other words, whether the human subject is inherently or at least potentially free, or whether he may be in fact forever enslaved to forces, urges, and drives beyond his control, be they social, political, economic, religious, moral, metaphysical, etc. For instance, Schelling's

[30] For more on the loss of trust in language in German philosophy around 1800, see Andrew Bowie, *Music, Philosophy, and Modernity*, Cambridge, Cambridge University Press, 2007, 53ff

[31] Immanuel Kant, *Critique of the Power of Judgment*, Cambridge, Cambridge University Press, 2000, 206.

[32] Wayne Bowman, *Philosophical Perspectives on Music*, Oxford, Oxford University Press, 1998, 128.

[33] I should add here that Stephen Rumph has offered a similar reading of E. T. A. Hoffmann's famous review of Beethoven's instrumental music, quoted above; see Stephen Rumph, "A Kingdom Not of This World: The Political Context of E. T. A. Hoffmann's Beethoven Criticism", *19th-century Music* 1995, 19.1, 50–67.

[34] Immanuel Kant, *Critique of Practical Reason*, Amherst, NY, Prometheus Books, 1996, 14.

[35] In light of Bowie's thesis that music was revalorised in German philosophy around 1800 as a compensation for the lack of freedom in real political life, Kant's unshaken belief in the transcendental freedom of the human subject may be one of the reasons why there was no such revalorisation of music in Kant's aesthetics; I have treated the matter in detail in Cvejić, *op. cit.,* 63–80 and "Andrew Bowie and Music in German Philosophy around 1800: The Case of Kant", in: Miško Šuvaković, Žarko Cvejić, and Andrija Filipović (eds.), *European Theories in Former Yugoslavia: Trans-theory Relations between Global and Local Discourses,* Newcastle-upon-Tyne, Cambridge Scholars Publishing, 2015, 5–11.

subject is forever torn inside, between its intuiting and intuited self, and achieves self-completion only by returning to God, that is, in death; in life, only art and especially music, expressive and aesthetically autonomous, offers fleeting comfort by reminding him of his primordial but lost fullness, to be recovered only in death;[36] even worse, Schopenhauer's subject does not even truly exist, but is only a manifestation of the Will, the inanimate and irrational drive that lies at the core of Schopenhauer's metaphysical system.[37] Those are just two notable examples, but the list could go on through the rest of the 19th and well into the 20th century and cover such ideologically disparate figures as Marx, whose subject is enslaved to capitalist relations of production, that is, to economic forces beyond his control; Nietzsche, for whom the main cause of man's lack of freedom is Christianity; Freud, whose subject is governed by sexual urges beyond his control, and so on. In Robert Pippin's summary, "much of the tone of post-Hegelian European thought and culture" demonstrates a "profound suspicion about that basic philosophical claim of 'bourgeois' philosophy … the notion central to the self-understanding and legitimation of the bourgeois form of life: the free, rational, independent, reflective, self-determining subject".[38] That is where, in Bowie's reading, art and especially music, with its unique expressivity and self-referential aesthetic autonomy, come in, as a source of consolation, providing a model, if only a utopian one, of freedom, if freedom could exist: "The aesthetic product thus becomes a utopian symbol of the realisation of freedom: in it we can see or hear an image of what the world could be like if freedom were realised in it".[39]

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Perhaps one could then say that in the view of early German Romantics and subsequent generations of thinkers, the human subject itself was reduced from the transcendentally free subject of Rousseau, Kant, and other thinkers of the Enlightenment to a sort of automaton, bereft of its own free will and entirely driven by forces beyond itself, political, economic, sexual, or whatever. The virtuoso, on the other hand, economically free, enterprising, daring, seemingly superhuman, appeared to defy that suspicion, but only when his performance included expression, that mysterious ingredient borrowed from contemporary aesthetics to guarantee the presence of a human element in musical performance, however virtuosic. In all other cases, even when it was technically perfect, as if performed by a machine, but deemed not *expressive* enough, it could be dismissed as that of an automaton and, along with it, the virtuoso himself as non-human or sub-human, rather than superhuman; in a word, an automaton. Thus what initially may appear as only a footnote in the history of 19th-century music reception—the criticism of virtuosi as automata—turns out to be intimately linked with one of the central features of European 19th-century philosophy and culture in general: the growing suspicion that the human subject is not inherently free, contrary to the claims of the Enlightenment of the preceding century and, indeed, to the much older claims of Christian dogma. It goes to show just how deeply ingrained the doubts regarding free human subjectivity were in European 19th-century culture, permeating even such unlikely, peripheral

[36] Schelling, *Philosophy of Art*, *op. cit.*, 23–24 and Friedrich Wilhelm Joseph Schelling, *System of Transcendental Idealism (1800),* Charlottesville, University Press of Virginia, 1978, 25 and 222–32. For a superb study of Schelling's philosophy see Andrew Bowie, *Schelling and Modern European Philosophy: An Introduction*, London and New York, Routledge, 1993.

[37] In Schopenhauer's words: "During life, man's will is without freedom" (*The World as Will and Representation, op. cit.,* Vol. II, 507); "[T]he individual, the person, is not will as thing-in-itself, but is *phenomenon* of the will, is as such determined" (*The World as Will and Representation*, *op. cit.,* Vol. I, 113).

[38] Robert Pippin, *The Persistence of Subjectivity: On the Kantian Aftermath,* Cambridge, Cambridge University Press, 2005, 5. Bowie similarly notes that "Modernity has also revealed the fundamental fragility of the subject"; Bowie, *Music, Philosophy, and Modernity, op. cit.,* 168

[39] Andrew Bowie, *Introduction to German Philosophy: From Kant to Habermas*, Cambridge, Polity, 2003, 57.

quarters as contemporary criticism of virtuosity.

Kamelia Spassova

MIMETIC MACHINES IN THE UNCANNY VALLEY

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Abstract: *Uncanny valley* (不気味の谷) is a notion introduced by the Japanese robotics professor Masahiro Mori in 1970. The basic claim of his hypothesis states that the anthropomorphic machines cause uncanny effect due to their imperfect resemblance to the human. Humanoids seem almost like people, but exactly the distance of this *almost* provokes hot debates. There are two trends in robotics, animation, architecture, and computer games. The first trend seeks to overcome the uncanny valley, constructing such an incredible machine that perfectly mimics human actions. The second trend – Masahiro Mori takes this side – consciously constructs non-anthropomorphic machines. The machine's appearance, structure, shape, proportion of the parts, and motion must be visibly different from the human ones. The term *uncanny valley* appears in a European context soon after its introduction, due to Jasia Reichardt's translation in 1978. She is an art critic and curator who is interested in the role of cybernetics in art. The joint between the uncanny valley in robotics and the legacy of Freud and Jentsch is established with this translation at the intersection point between aesthetics and science. This link opens new fields to theoretical and aesthetic imagination.

Keywords: mimesis, uncanny, uncanny valley, Bukimi no Tani, doubles, mimetic machines, likeness, unconcept, negative anagnorisis, heterogenesis

1. The Automaton-seer: Something Hidden has Become Visible

> "All figures of this sort," said Lewis, "which can scarcely be said to counterfeit humanity so much as to travesty it-mere images of living death or inanimate life-are most distasteful to me. When I was a little boy, I ran away crying from a waxwork exhibition I was taken to, and even to this day I never can enter a place of the sort without a horrible, eerie, shuddery feeling [**ohne von einem unheimlichen** grauenhaften Gefühl ergriffen zu werden]. [...] The fact of any human being's doing anything in association with those lifeless figures which counterfeit the appearance and movements of humanity has always, to me, something fearful, unnatural, I may say terrible, about it [etwas Drückendes, **Unheimliches**, ja Entsetzliches].[1]

[1] E. T. A. Hoffmann, *The Best Tales of Hoffmann*, ed. E. F. Bleiler, trans. Alexander Ewing (New York: Dover Publications, 1967), 81, 95; E. T. A. Hoffmann, 'Die Automate', in *Gesammelte Werke* (Null Papier Verlag, 2013).

The preceding reflections on mimesis and the uncanny are delivered by Ludwig the musician, a character in E. T. A. Hoffmann's short story *The Automata*. The story was first published in 1814 (in the literary magazine *Zeitung für die elegante Welt*) and again five years later as part of his collection of novellas and fairy-tales, *The Serapion Brethren*. The thoughts were prompted by the machine music created by professor X's anthropomorphic automata. One of these robots is the enigmatic Talking Turk who "reads" people's unconscious and foretells their destiny. Unlike Wolfgang von Kempelen's historical machine, constructed in 1769, which got burned in a fire in 1854, and which mercilessly defeated all of its opponents on the chess board, Hoffmann's automaton, the Turk, is not a chess player but a fortune teller. His character makes the problem of free will central to most of Hofmann's novellas. This constitutes the old question of whether fate can be intentionally and freely determined or if it is under the control of automatic, uncontrolled forces. Hoffmann marks a key change in the image of the fortune teller — from the realm of the religious and the mystical to the realm of the logical and the mechanical. The enigmatic connection between the *living* and the *automatic*, as well as the *imitation game* between the two appear in the works of both Kempelen and Hoffmann. This riddle is a generally shared contextual mystery in the transitional period between the Age of Enlightenment and Romanticism.

The non-human figures — wax sculptures, dolls, puppets, anthropomorphic automata, and all types of mimetic machines in general— can trigger a feeling of inexplicable horror in us, they can cause us to experience the uncanny effect and can evoke a feeling of trouble and anxiousness in any human creature, for there is something about their resemblance to humans that *just isn't right*. The automatism of a box's secret compartment that pops-up is central for the uncanny effect which corresponds to Freud's idea of *unheimlich* . Be it the dwarf hidden inside the machine (as is the case for Kempelen's Turk) or the very opposite — the machine hidden inside the human (the automatism of the unconscious repetition), there is something that is valid for both — the algorithm of something hidden that suddenly emerges and disturbs us with its untimely appearance.

Similarly to the utterances of ancient oracles, while answering the questions that are directed to him, Hoffmann's automaton the Turk exposes all secret incentives and hidden desires and, ultimately, a fatalistic predestination. He reveals the fate of the questioner and lays it out on the chess board. The Turk's head is a perfect reproduction of a human one. He rolls his eyes, turns his head, stamps his feet, and out of his mouth comes a stream of air, the product of an acoustic illusion. But the characters in the story suspect that a human being with supernatural powers is hidden inside of him that can "read" the questioner's unconscious.

The short story *The Automata*, together with the set of problems that surround the topic of a subject that is divided in two, and the peculiar connection between the living and the mechanical, the contingent and the fateful, the visible form and the hidden grounds, between free will and instrumentality, between the figure of the inventor and his creation, the automaton, raises another question, that of what machines should look like. Only it is a question of aesthetics and not of substance.

2. Mimesis and *Unheimlich* as Coordinates in the Uncanny Valley

A third concept can be added to the history of the notions of *mimesis* and *unheimlich* (uncanny) that

acts as an edge and a point of intersection between the two. That is namely the notion of 不気味の谷現象 (*Bukimi no Tani Genshō*), or *the uncanny valley phenomenon.*

Mimesis and *unheimlich* are part of the *Dictionary of Untranslatables*, their genealogy is rooted in Ancient Greek and German, languages that have created these very concepts, as well as the episteme, which they are part of.[2] The history of their translations in other European languages through the years is not just an interesting story and a colorful contextual cross section, but it also introduces the slow transition, the long-term migration of concepts and traditions, the gradual shift of paradigms: not through rebellion but through translation. They serve as instruments for working with the incomprehensible, but there is something in their very definition that cannot be fully mastered through conceptualization. This unstable limitation of their definition is a result of negativity and non-self-correspondence, of their inner changeability, all of which are crucial when it comes to contemplating these concepts.

In short, *mimesis* and *unheimlich* are concepts about the incomprehensible and unidentical. Looking into them, and the grid of concepts around them, is an indispensable condition when entering the uncanny valley, as long as the main coordinates are *imitating* the human on one hand, and the *uncanny effect* on the other. In the function known in the field of robotics as *Bukimi no Tani*, or *uncanny valley*, the mimetic is located on the x-axis and the uncanny on the y-axis. All this considered, the fact that the uncanny valley could be illustrated with mathematical precision doesn't eliminate the mystery and the magnetism that arises from it. How should we approach it? As a concept, as an idea, or simply the way we would approach any other contemporary myth?

Putting the hypothesis of *Bukimi no Tani* between the seriousness of its scientific argumentation and the casual rejection of it as a myth is a historical experience that resembles the fate of the concepts of *mimesis* and *unheimlich*. The attempt to walk through the *uncanny valley* should outline the wagers of the anthropomorphic (human-like) and non-anthropomorphic (unhuman-like) trends, led by the problem of the machines' appearance.

3. Human Care and Unhuman Design

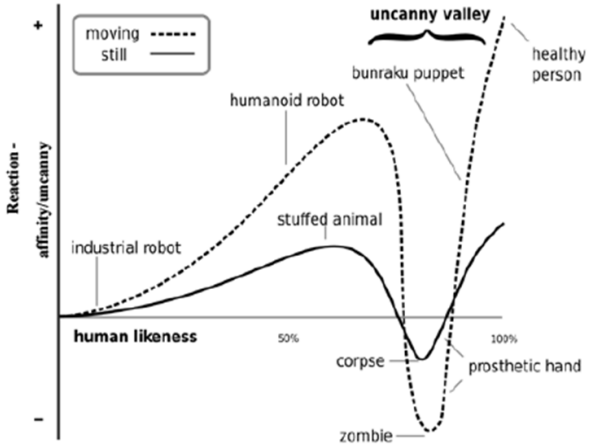

Fig. 1

[2] Barbara Cassin et al., eds., *Dictionary of Untranslatables: A Philosophical Lexicon* (Princeton: Princeton University Press, 2014).

Bukimi no Tani (不気味の谷現象; *uncanny valley*) is an idea introduced by Japanese robotics professor Masahiro Mori in the year 1970.[3] Mori's hypothesis can be reduced to the proposition that anthropomorphic machines trigger an uncanny effect with their imperfect resemblance to humans. Humanoids look almost the same as people but this distance of *almost like* provoked heated debates. Two trends then arose in the field of cybernetics, animation, architecture, and video games that discuss the effects of the uncanny valley. One of them tries to overcome the *uncanny valley* by creating a machine that perfectly imitates humans. The other one, to which Mori's hypothesis belongs, takes the path of consciously constructing non-anthropomorphic machines — their appearance, structure, form, and the proportion of their elements must be different than those of humans.

In his article, Mori shares a prophetic thought: "In fact I predict it is possible to create a safe level of affinity by deliberately pursuing a nonhuman design. I ask designers to ponder this."[4] The concern shared by Masahiro Mori along with his hypothesis of the valley is that the machines' human appearance should consciously be designed with non-human forms in order to provoke sympathy in people instead of an uncanny feeling. Something should be hyperbolized, disproportionate, deformed, in order to definitively set a boundary and create a distancing effect, so that it would be clear from first sight which one is the human and which one the machine.

The uncanny valley was first defined by Mori as a function that is not continuously increasing, or, where the increasing of *x* doesn't necessarily cause *y* to increase as well. In other words, the function should mark the lack of symmetry. Such a relation doesn't exist: the more human-like the machines get, the more heartedly embraced they are by people. Mori compared the non-monotonic function to mountain climbing where the hills and valleys, highlands and lowlands do not stand in a dependency relation with the distance to the top of the hill or with the fulfilment of the goal. This comparison is also where the spatial metaphor in the uncanny valley's name comes from, since it represents an area of rapid descent where the automata become *almost* indistinguishable from humans by appearance but instead of provoking sympathy, they scare us.

Industrial robots for instance do not fall inside the valley's reach because of the metallic materiality of their design that gives humans a sense of distance with respect to their appearance.[5] They do not resemble humans and do not cause fear because the line between human and unhuman remains uncrossed. Their appearance is subordinated to their functionality. They are simply perfected work instruments that help humans. On the other hand, the attempts to create artificial intelligence in the field of robotics are "dressed" in a more and more anthropomorphic design: the

[3] The article was published in 1970 in Japanese magazine *Energy* and for a long time didn not draw a lot of attention: Masahiro Mori, 'Bukimi No Tani [the Uncanny Valley]', trans. Karl F. MacDorman and T. Minato, Energy 7 (1970): 33–35. Its latest English translation that stimulated current discussions around the concept, came out in 2012, as this time, the translation was authorized by Mori himself: Masahiro Mori, 'The Uncanny Valley', trans. Karl F. MacDorman and Norri Kageki, IEEE Robotics & Automation Magazine 19, no. 2 (2012): 98–100, http://goo.gl/iskzXb.

[4] Masahiro Mori, 'The Uncanny Valley', trans. Karl F. MacDorman and Norri Kageki, *IEEE Robotics & Automation Magazine* 19, no. 2 (2012): 99, http://goo.gl/iskzXb.

[5] A good example for this can be taken out of the TV series *Battlestar Galactica* – the industrial robots, or *the Toasters* do not trigger the effect of anxiety, they do not fall into the uncanny valley as opposed to the twelve humanoid model Cylons that are an almost perfect human reproduction. They are the ones who undermine the line between human and unhuman. Questioning the notion of the human in light of "the ungraspable phantom of the vanishing difference between the humans and the machines" is excellently picked up by the fine analysis of TV series *Battlestar Galactica* in: Miglena Nikolchina, 'An Unfinished Project: Man as Comedy', in Lost Unicorns of the Velvet Revolutions: Heterotopias of the Seminar: Heterotopias of the Seminar (Fordham University Press, 2013), 107.

automata begin to look *as if* they were people. This resemblance becomes disturbing. It is what marks the moment of losing the sense of sympathy. This is the zone of the uncanny valley: where the mimetic machines trigger an incomprehensible anxiety. This is precisely the axis of affinity that marks a rapid decline or the causing of the uncanny (*unheimlich*) effect when the resemblance on the human likeness axis increases. The zone of the uncanny valley represents this inverse relationship — greater human likeness, and yet, people's attitude towards robots is that of anxiety and fear.

In the 1970s Mori observed a trend in the field of cybernetics towards spending a much greater effort into robots' appearance than into their functionality, as if the path towards conscious machines goes through the creation of humanoids that perfectly resemble the human form. But this very pattern of imitating external appearance is what will place them inside the uncanny valley — instead of becoming affinitive to humans they will become *unheimlich*. In this way they cast the shadow of anxiety over the notion of what is human.

The example which Mori used to mark the entering of machines into the uncanny valley is the prosthetic hand. Just like Ludwig, the protagonist in Hoffmann's *The Automata*, Mori admits that he never liked looking at wax figures because they looked creepy to him.[6] The prosthetic hand has had the same disturbing effect on him, as the creepy feeling intensifies if the hand starts to move, as is the case with myoelectric prosthetics. A key factor in the artificial hand's indistinguishability from a real human hand is that it is designed to be covered with skin instead of bolts and metal cylinders. The anthropomorphic trend focuses on the machines' skin.

Therefore, Masahiro Mori's hypothesis suggests that in the increase of similarity between human and machine, a certain point comes where telling the two apart becomes difficult, and it is this very moment that triggers the negative (*unheimlich*) effect of uncanniness, repulsion, terror, and anxiety. The factors for increasing the uncanny feeling are *movement* and *imitating the human*.

The methods of counteraction against this *unheimlich* effect include deautomatization, estrangement, and consciously designed dissimilarity. This is also where Mori's call to unhuman design in robotics stems from — instead of creating humanoids, he designs *swarm robots* that interact with each other in an autonomous system. Mori proposed that the models for wooden hand prosthetics shouldn't resemble human hands, but instead, those of Buddha's statues, because those ones don't leave fingerprints. This example with Buddha is no coincidence. Mori believes that robots' imitation of humans shouldn't be identical and symmetrical, rather, it should be directed towards a third entity, like the idea of the Buddha. Four years after the hypothesis of the uncanny valley, Mori developed the concept concerning transcendental imitation in his book *The Buddha in the Robot*, where he tried to solve the mystery of human consciousness through the concepts of Buddhism.[7] But one can recognize Mori's concern which analyzes the human both through the perspective of robotics and the Zen philosophy as early as in the uncanny valley hypothesis with the instability of the progressive function, with the non-monotonical rhythm of ascents and descents.[8]

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[6] N. Kageki, 'An Uncanny Mind. An Interview with M. Mori', *IEEE Robotics Automation Magazine* 19, no. 2 (2012): 102–8, https://doi.org/10.1109/MRA.2012.2192819.

[7] Masahiro Mori, *The Buddha in the Robot: A Robot Engineer's Thoughts on Science and Religion (1974)*, trans. Charles S. Terry (Tokyo: Kosei Publishing Co., 1981).

[8] About the link between the uncanny valley and the book *The Buddha in the Robot* as Mori's general philosophy, see: W.A. Borody, 'The Japanese Roboticist Masahiro Mori's Buddhist Inspired Concept of "The Uncanny Valley" (Bukimi No Tani Genshō, 不気味の谷現象)', *Journal of Evolution and Technology* 23, no. 1 (2013): 31–44, https://jetpress.org/v23/

4. Hiroshi Ishiguro's Doppelgänger on the Way to Overcoming the Valley

Fig. 2

It is key to name another Japanese professor on the scene of current trends in robotics — that of Hiroshi Ishiguro. He continues to study the uncanny valley but with the goal of overcoming it: the robots will look like humans, but they will no longer scare us. His effort is contrary to that of Masahiro Mori. While the latter maintains that there should be estranging elements in the robots' appearance, the former aims to create the perfect humanoid robot. Thus, the two Japanese professors represent the two diametrically opposite trends in robotics: Mori maintains the *anti-anthropomorphic* principle, while Ishiguro defends the *anthropomorphic* one. Concerned about the disturbing closeness between man and robot, Mori seeks a transcendent way for juxtaposing the two, while Ishiguro focuses on studying the matter of *human likeness* with regards to the design of the perfect androids.

"The good disciple," Ishiguro, extended his teacher Mori's thesis about the uncanny valley in a critical perspective, but his aim, opposite Mori, is a greater effectiveness in bringing robots' design closer to the human appearance. He views the automata's appearance and the similarities between man and robot as a complex navigation system. The robots' movements are no longer just mechanically constructed but also reconstructed with regards to more precise operators of imitation — mimics, gestures, speed of movement, and gracefulness. The perfect machine which will successfully overcome the uncanny valley should, according to Ishiguro, imitate man not just statically but with motion — with certain gestures and mimics. Robots are not simply dressed in human skin, they are set up with a program for gesticulation, they mimic unconscious movements of the hands and eyes, they exhibit parasitic body movements, and they present certain *gestus.* Yes, mimetic machines are the perfect mimes. Hiroshi Ishiguro set out to design robotic Doppelgängers.

Ishiguro is the director of a robotics laboratory in Osaka University that develops *actroids*, a type of androids or humanoid robots produced by Japanese company *Kokoro*. The first female *actroid*, — Repliee Q1, appeared in January of 2004. The improved version from July of 2005 could now blink constantly. She had a whole range of gestures that were copied from her human prototype Ayako

borody.htm.

Fuji. The way the robot was trained to imitate natural movements was through the placement of numerous special sensors across key points on the prototype's body and face so that the whole of its physiognomics got copied and installed into the robot. Scientists in the fields of anatomy, neurology, cognitive science, computer science, cybernetics, design, and animation took part in this project that aimed to overcome the uncanny valley. Once they get switched on, the androids start to constantly move, shake their heads, and blink; parasitic body movements that resemble neurological activity were programed into them, a simulacrum of a biomimetic mechanism. The female android is just like Olympia from Hoffmann's *The Sandman* — she constantly nods, blinks affirmatively, and spontaneously sighs "Ah! Ah!"

In July of 2006, after creating his very own Olympia, Professor Hiroshi Ishiguro designed the robot Geminoid-HI-1 in his own image and likeness. Ishiguro literally calls him *my Doppelgänger*. In a series of interviews, television shows and videos on the Internet, Professor Ishiguro talks about the convenience of having one's robotic Doppelgänger.[9] For instance, while he is at a conference in Kyoto, his Doppelgänger could easily teach his classes in Osaka University. Ishiguro's double presence became part of a media campaign of sorts that aimed at overcoming the uncanny valley, i.e., rejecting Mori's theses about the fear of mimetic machines. Ishiguro stands proudly next to his Doppelgänger as a living proof that, after all, it is not so scary.

Naturally, Ishiguro's team performed a series of experiments behind the scenes with the goal of scientifically identifying the limits of the uncanny valley. In the 2009 article *My Robotic Doppelgänger*[10], Ishiguro and his three co-authors critically reviewed the hypothesis of the uncanny valley through an experiment that was conducted among 19 male and 13 female participants with the average age of the participants being 20 years old. The participants were seated in a room one by one facing either Hiroshi Ishiguro or his Doppelgänger. They had to look at each other for some time and then begin to discuss the following three questions: How old are you? What university do you go to? What is your name? The machine was not equipped with an autonomous dialogue system and therefore the conversation had to be as formal as possible. The aim of the experiment was to determine how long it takes the participant to figure out if he or she is talking to the human Ishiguro or his robotic Doppelgänger. The outcome revealed that the recognition requires no longer than two seconds, the first impression is, as a rule, crucial (as is the case with love, Ishiguro adds, and refers to some studies according to which the outcome of any love encounter is usually determined in the first 30 seconds). Following this "conversation" with the human/robot the participants in the experiment had to fill out a questionnaire with the purpose of measuring their sense of *affinity/uncanny* (*heimlich/unheimlich*). The scale used seven factors to identify the kind of feeling that was experienced: unnatural/natural; machine-like/human-like; unconscious/conscious; artificial/organic; stiff movement/smooth movement. The observation was made that "anthropomorphism is a complex phenomenon involving multiple dimensions. Not only the appearance but also the behaviour of a robot can have a considerable influence on anthropomorphism."[11] Ishiguro believes that reducing the study of human likeness (the mimetic operator) down to just two factors — *affinity/uncanny* and *likeness/unlikeness*, as M. Mori does in the graph of the uncanny valley, is too limiting. The main

[9] See for instance "Humanoid Robot - Gemonoid HI-1 Android Prototype": url= https://www.youtube.com/watch?v=uD1CdjlrTBM

[10] Hiroshi Ishiguro et al., 'My Robotic Doppelgänger - a Critical Look at the Uncanny Valley', *The 18th IEEE International Symposium on Robot and Human Interactive Communication. Toyama*, 2009, 269–76, https://doi.org/10.1109/ROMAN.2009.5326351.

[11] Ishiguro et al., 274.

conclusion of the experiment was that finer degrees and levels of anthropomorphism exist. The key aspects in a robot's capability of attraction and naturalness are undoubtedly gracefulness and the smoothness of their movements. According to Ishiguro, this disproves Mori's hypothesis that moving androids are creepier.

The theoretical argument in the article *My Robotic Doppelgänger* is once again a linguistic one — this time regarding the untranslatability of the Japanese word *shinwakan* **(親和感)**. Robotic engineers asked some Japanese linguists, and the results are in — the word cannot be properly translated and therefore a full consensus on its translation cannot be reached. Ishiguro proposed that *shinwakan* not be translated with the established *familiarity* and *affinity* but with the much more suitable term *likability*. In order to demonstrate the complexity of *shinwakan,* he invented a more sophisticated scale than the one with seven factors for detecting empathy or antipathy towards robots. *Shinwakan* is a feeling of something familiar, kindred, homelike, affinitive — all that attracts, and, consequently, the negative levels on the scale are a perfect opposite of that feeling — the unpleasant effect of repulsion, horrification and petrification — *bukimi*. However, the adjective *shinwateki* **(親和的)** can also mean *synchronous*, i.e., the specific closeness and synchronicity between man and machine, the gemination, simultaneity and parallelism between them.[12]

Theoretically, in his attempt to overcome the uncanny valley, Hiroshi Ishiguro widened the complexity of Mori's scheme to the point where he practically created an android Doppelgänger. These mimetic machines helped him shorten the distance between man and robot, which served the ambition of making robots *almost like humans,* but the mystery of the *almost* remained unsolved. In its attempts to make machines like humans, Ishiguro's laboratory found itself facing the question of what likeness actually is.[13]

What Ishiguro failed to translate in his previously discussed article is, namely, the European tradition of identifying the notion of *unheimlich* with that of *bukimi*. A similar "translation" appeared in the two conferences on robotics in 2013 — in Germany and Japan, where among the engineers and robotics specialists, humanities scholars also took part who easily associated the European tradition of theoretical psychoanalysis with Japanese robotics.[14] M. Mori and H. Ishiguro participated side by side in the conference in Tokyo —one of them continued to insist on building unhuman robots, while the other methodologically laid out step by step how the uncanny valley will be overcome: the mimetic machines, these ever more perfect imitators of the human, will no longer be bothering us.

The businesses, from another perspective, observes that there are two trends in the field of robotics — the anthropomorphic and the non-anthropomorphic, and, without choosing one of the options, bravely sell human, as well as unhuman robots. At the reception of the "Hen-na" hotel ("Strange hotel"[15]), close to Nagasaki, which first opened in 2015 and was marketed as being ser-

[12] With gratitude to Futoshi Hoshino for his notes and explanations about *shinwakan* in the context of the synchronicity effect.

[13] The question about likeness and imitation in the sense of *mimesis* has been repetitively bothering philosophers as early as Plato. The book *Modern Mimesis* is dedicated to part of these concerns in the context of literature and its self-reflexive function.

[14] The conferences are: IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, May 10, 2013 и IEEE/RSJ International Conference on Robots and Intelligent Systems (IROS), Tokyo International Exhibition Center, Room 703, Nov 6, 2013.

[15] Henn-na Hotel, 変なホテル – the name "Strange hotel" clearly refers to *the uncanny valley*, therefore we can assume

viced exclusively by robots, visitors can bravely choose to be accommodated by the human-like female android or by the friendly dinosaur. It is up to the random client of the "Hen-na" hotel to decide which one of them is creepier, which one is less human-like or... which one is more comical.

Fig. 3.

5. 不気味の谷現象to Uncanny Valley: Synchronizing Traditions

The dynamics of the German word pair *heimlich/unheimlich* make it suitable for the translation of the Japanese antonyms *shinwateki/bukimi*. *Bukimi* is the Japanese translation of the title of Sigmund Freud's essay *Das Unheimliche* (1919), where he makes a broad linguistic remark about the ambivalence of the adjective *unheimlich*. The translation of *unheimlich* as *bukimi* in Japan appeared even before the publication of Mori's hypothesis about the uncanny valley. With his works in the field of robotics, Mori is well placed within the European line of interpretation of the *unheimlich* phenomenon: from Hoffmann's romanticist short stories, to Jean Paul and Mary Shelley, and through the establishment of the notion of *unheimlich* in Sigmund Freud and Ernst Jentsch's works as a category on the edge of aesthetics and psychoanalysis, to the numerous lines of interpretation in post-Structuralist theory about the automatism of the return of the repressed and about the intersection between *repetition* and *negation*. This comes to show that, without the need of additional speculation about whether Masahiro Mori took inspiration from Freud, or whether he specifically read and was familiar with Jentsch's article (most probably not), that there are clearly too many parallels and coincidences present between the phenomena of *unheimlich* in Jentsch and Freud's works and *bukimi no tani* in Mori's to be ignored. Furthermore, it was precisely in the 1970s when Freud's essay was rediscovered by the French theoretical scene and heated conceptual debates sparked around it.[16]

The polish curator, Jasia Reichardt, who takes great interest in cybernetics' significance in art, played a key role in the synchronization between the European and Japanese traditions. The term *uncanny valley* emerged shortly after Mori brought it into the Japanese context and it was done so by virtue of Reichardt's 1978 translation. This is when it was established that *the uncanny valley* and

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that such a link is deliberate: url=http://www.h-n-h.jp/en/. The cost for one night in a room for two in October of 2021 is approximately 100 euros.

[16] See more in: Anneleen Masschelein, *The Unconcept: The Freudian Uncanny in Late-Twentieth-Century Theory*, SUNY Series, Insinuations: Philosophy, Psychoanalysis, Literature (New York: SUNY Press, 2011).

Freud's and Jentsch's heritage in the European scene connect at the point of intersection between aesthetics, psychoanalysis, technology, and science. This connection uncovered new paths of development for theoretical and aesthetic imagination.

During the time when she was the director of London's Institute for Contemporary Arts (ICA), Jasia Reichardt curated the exhibition *Cybernetic Serendipity* (1968) — one of the early and greatly influential exhibitions of generated art.[17] In the exhibition the robots are the ones who paint, write poetry, and create music. The people who programmed them now call themselves 'digital artists' and a year after the exhibition they founded The Computer Arts Society (CAS) whose scientific profile is the interaction between science, cybernetics, and art.

Besides curating such an emblematic exhibition, Jasia Reichardt also wrote the book: *Robots: Facts, Fiction, and Prediction.* One of the chapters in her book addresses Mori's valley. Its title is *Human reactions to imitation humans, or Masahiro Mori's Uncanny Valley.*[18] Here, Jasia Reichardt lays out Mori's hypothesis of the valley and introduces the translation *uncanny valley*. Without explicitly referring to Jentsch and Freud, this connection is already a working one, since the established English translation of Freud's notable essay *Das Unheimliche* (1919) is precisely *The Uncanny* (1925).[19]

Mori's *bukimi no tani* can only benefit from the recognition of the heritage of the European humanities, from references to the observations made by Freud and Jentsch, to the authors who comment on them throughout the 20th century. The extremities of experiencing a sense of empathy and its rapid disruption caused by the increasing affinity between man and machine synchronize well with the paradoxes of *the uncanny.* The affinitive, comfortable, and homelike suddenly become unfamiliar. Our hidden fears pop-up right in front of us, embodied in flesh and blood, our hidden fears. There, on the very edge, where it's difficult to tell apart the living from the non-living, the organic from the mechanical, and the human from the non-human.

6. Negative *Anagnorisis* and *Unheimlich*: Jentsch and Freud

The whole debate about *unheimlich* started from one of Jentsch's articles from 1906, while Freud and Otto Rank later revise, critique, develop and adapt Jentsch's ideas.[20] Jentsch's theory is directly linked to the concept of the automata, and the *unheimlich* effect is, according to his perception, a result of intellectual uncertainty, of not being able to tell if the thing in front of you is living or non-living, organic or mechanical, a human or an automaton.

> In storytelling, one of the most reliable artistic devices for producing uncanny effects easily is to leave the reader **in uncertainty as to whether he has a human person or rather an automaton before him in the case of a particular character.** This is done

[17] Jasia Reichardt, *Cybernetic Serendipity: The Computer and the Arts*, Exhibition Catalog. Exhibition Organized At the Institute of Contemporary Arts, Nash House, London, August 2-October 20, 1968 (Praeger, 1969).
A recording that lays out Jasia Reichardt's concept, as well as footage from the exhibition and the generated art of the machines can be found here: url=https://www.youtube.com/watch?v=n8TJx8n9UsA .
[18] Jasia Reichardt, 'Human Reactions To Imitation Humans, or Masahiro Mori's Uncanny Valley', in *Robots – Fact, Fiction, Prediction* (New York: The Viking Press, 1978), 26–27.
[19] Sigmund Freud, 'The Uncanny (1919)', in *The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume XVII (1917–1919)*, trans. Alix Strachey, 1925, 368–407.
[20] Ernst Jentsch, 'Zur Psychologie Des Unheimlichen', *Psychiatrisch-Neurologische Wochenschrift*, no. 8.22; 8.23 (1906): 203–5.

> in such a way that the uncertainty does not appear directly at the focal point of his attention, so that he is not given the occasion to investigate and clarify the matter straight away; for the particular emotional effect, as we said, would hereby be quickly dissipated. In his works of fantasy, E. T. A. Hoffmann has repeatedly made use of this psychological artifice with success.[21]

This is the very excerpt from Jentsch that Freud cites in his essay *Das Unheimliche*, as he goes on to claim that he's solving his colleague's mystery — this observation refers to, most of all, Hoffmann's *The Sandman*. Freud shares his disagreement with Jentsch's general thesis about intellectual uncertainty caused by moving automatons. What he especially takes interest in is the *example* of Hoffmann and his wax figures, dolls and automata. Freud uses the example of Hoffmann to explain the *unheimlich* phenomenon but attaches it to quite a different theory.[22]

The story of *The Sandman* illustrates the point of the gaze, the fear of going blind, the castration complex, the Oedipus complex, the redoubled father figure, and, generally, the Doppelgänger — all of which constitute central elements of Freud's method. Hoffmann's fairy-tale will later become a crucial example in the Austrian psychoanalyst's work on clarifying the operating mechanism of *unheimlich*: to negate and repeat at the same time. The *unheimlich* effect represses the familiar, domestic and affinitive that returns as unfamiliar, strange and uncanny. Thus an intimate core swoops into the gaze from the outside, as a foreign body (later Lacan will term it *extimité* in order to emphases the coincidence of inside and outside)[23].

Freud cites this excerpt from Jentsch's article and criticizes his theses in order to present his own. However, Jentsch's article also includes the following segment that Freud left out in his citation (every citation is inevitably a cropping or a castration since it always reduces and decontextualizes):

> This peculiar effect makes its appearance even more clearly when imitations of the human form not only reach one's perception, but when on top of everything they appear to be united with certain bodily or mental functions. This is where the impression easily produced by the automatic figures belongs that is so awkward for many people. Once again, those cases must here be discounted in which the objects are very small or very familiar in the course of daily usage. A doll which closes and opens its eyes by itself, or a small automatic toy, will cause no notable sensation of this kind, while on the other hand, for example, the life-size machines that perform complicated tasks, blow trumpets, dance and so forth, very easily give one a feeling of unease. The finer the mechanism and the truer to nature the formal reproduction [naturgetreuer die gestaltliche Nachbildung wird], the more strongly will the special effect also make its appearance.[24]

If we go back to the excerpt from Hoffmann's *The Automata* in the beginning of this article, it becomes perfectly clear that, through his observations, Jentsch retells Ludwig's thoughts on the difference between the nice little doll and the anthropomorphic musical automata that evoke incom-

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[21] Ernst Jentsch, 'On the Psychology of the Uncanny (1906)', trans. Roy Sellars, *Angelaki* 2, no. 1 (1 January 1997): 13, https://doi.org/10.1080/09697259708571910. (bold is mine).
[22] Sigmund Freud, 'Das Unheimliche', Imago, no. 5 (1919): 297–324.
[23] More about Freud's *unheimlich* and Lacan's *extimité* in Maria Kalinova, 'Exotopy: Mikhail Bakhtin and Jacques Lacan on the Outside Context of Discourse', *Slavica Tergestina* 20, no. 1 (2018): 98–117, https://doi.org/10.13137/2283-5482/22384.
[24] Jentsch, 'On the Psychology of the Uncanny (1906)', 12.

prehensible horror. Of course, *The Sandman*'s Olympia is an automaton as well, she is a pianist, which makes the reference clear, or, to be more exact, makes clear the contamination that Freud makes. The Austrian psychoanalyst doesn't just merge the automata from both *The Sandman* and *The Automata,* but he also shifts the focus in his interpretation from the automaton Olympia[25] to the character of the Sandman.[26]

However, Jentsch does not mention *The Sandman* anywhere in his article. If one was to make a comparison it could easily be noticed that he implicitly refers to Hoffmann's *The Automata*. Freud, on the other hand, believes that *The Sandman* is Hoffmann's major work, and it is namely through this example that he subverts Jentsch. Freud shifts the focus from the intellectual uncertainty caused by the automaton Olympia towards the repetition, duplication, and negation, and, above all, towards the return of the repressed and the castration complex. In his version, Hoffmann's story offers a series of Doppelgängers: Olympia-and-Nathaniel, Coppelius-and-Coppola, and the father-and-Spallanzani. This is how Freud develops his own theory. On a similar note, what Jentsch actually cites from Hoffmann (*The Automata*) and why Freud assumes that that the citation is from another story (*The Sandman*) — sheds light on the mechanism for constructing literary figures through exemplification, or, how the discourses of humanities fall under the spell and charm of certain literary examples. Together, Hoffmann's *The Sandman* and Freud's theory of *unheimlich* form a common enigmatic knot, they explain each other: Freud's theory evokes precisely this example and vice versa. Regardless of whether Freud's theory gets criticized (negated) or confirmed (repeated) over and over again, the ones who comment on it use this exact story in their arguments. This is because, ever since Freud, in the debates about what *unheimlich* is, it is no longer possible for one to not also look into *The Sandman* through the glass of new interpretations.[27]

The fascination with Freud and *The Sandman* in the 20th century leaves Jentsch's article in the background. I will come back to its goals with regards to the idea of anthropomorphic mimetic machines. Jentsch suggests in his hypothesis that the *unheimlich* effect has to do with two factors: 1. a zone of indistinguishability between the living and the non-living, between what is human and automatic, and 2. the animalization, setting in motion, or animation of the automata. These two factors are central in Mori's graph of the uncanny valley — the first one represents the mimetic operator (the x-axis), and the second represents the variation that occurs when motion ensues (the y-axis).

Crucial for both Jentsch and Mori is the point of the lack of recognition — not being able to tell

[25] It is interesting that Julia Mark – Hoffmann's young love in Bamberg – can be recognized not in the romanticist character of Olympia, but in the in the enlightened Clara (even in her name we can hear German Aufklärung), she does not want to be an automaton, even if this automaton would play music beautifully.

[26] About Freud's shift of focus towards *The Sandman*'s Olympia, as well as about the limits of his thesis between the offspring of the eyes and the offspring of the genitalia, see: Miglena Nikolchina, 'Love and Automata: From Hoffmann to Lem and from Freud to Kristeva', *Contributions to the Study of Science Fiction and Fantasy* 65 (1995): 77–82; Sarah Kofman, 'The Double Island the Devil. The Uncanniness of The Sandman', in *Freud and Fiction*, trans. Sarah Wykes (Cambridge: Polity Press, 1991), 121–62.

[27] For the link between *The Sandman* and Freud with regards to the mystical anxiety from a family crypt and a buried enigma, see: Nicholas Rand and Maria Torok, 'The Sandman Looks at "The Uncanny"', in *Speculations after Freud: Psychoanalysis, Philosophy, and Culture*, ed. Sonu Shamdasani and Michael Münchow (London and New York: Routledge, 1994), 185–204. On the subject of the aesthetic category of uncanny and its role in literature in the prism of the notions of setting, framework and point of view, as well as the ideas of mastery, control, and uncertainty, see: Darin Tenev and Enyo Stoyanov, 'Literary Uncanny', in *The Sublime and the Uncanny*, ed. Futoshi Hoshino and Kamelia Spassova, UTCP Booklet 27 (Tokyo: UTCP, 2016), 41–65.

if something is living or lifeless; if it's imitation or not; if it's an illusion or not. The uncanny effect blurs the lines between self and non-self, and with such an erasure of the negation, the line itself becomes ambivalent, and well-established oppositions such as in/out, organic/mechanical, human/unhuman can potentially abruptly change their places.

The uncanny category indicates a division of the subject. This division can be historically analyzed, as Mladen Dolar outstandingly does in the context of the Enlightenment, and its dark side, Romanticism, in order to develop the thesis that "there is a specific dimension of the uncanny that emerges with modernity."[28] He demonstrates a genealogy of the modern subject through the figure of the Doppelgänger and the aesthetic category of *unheimlich*. This is a category of the gap and division, the subject can be viewed as always divided and unidentical to itself (I = I +/- a).[29] And if the death drive is a repetition compulsion towards the very same thing, then *unheimlich* is the effect of the incapacity to be repeated without a slight divergence. A repetition where the limitations of (self)identity and identification are always undermined. What is crucial for creating a link between repetition and negation in the context of *unheimlich* is the point of unrecognizability. That is, not being able to tell on which side of the line the thing before you is standing — in or out, subject or object, human or unhuman. This point of the lack of recognition can be defined through Aristotle as *negative anagnorisis* or as a transition from knowing to unknowing.[30]

The Ljubljana school of psychoanalysis consistently deals with trying to distinguish between the tragic, the comical, and the uncanny through the operators of negation (Hegel), the figure of the Doppelgänger (Freud), and the notion of extimacy (Lacan). The recognition (*anagnorisis*), as Alenka Zupančič skilfully demonstrates, works either through the axis of the tragic as the logic of the sacrificial and the exceptional, or, through the axis of the comical as perpetual minimal difference between two similarities through a montage of them.[31] Therefore, this hypothesis suggests that the indistinguishability between the two axes, between the tragic and the comical logic, opens a gap which causes the *unheimlich* effect.

When illustrating the difference between the comical and the uncanny, Alenka Zupančič likes to give the example of the actor who played a dead body on stage and as he was pretending to be dead during the play, he sneezed. To the audience and the actors sneezing was comical, but for the characters that are part of a theatrical illusion, it would have been *unheimlich*: the dead character suddenly moves.[32] It is funny for a corpse to sneeze only if we know that he is not really a dead body but a living actor. The logic of the comedy always requires the metaposition of an audience that knows more than the characters. In order to laugh, one should be able to observe from aside or from above, separated from the action, whereas the logic of *unheimlich* is based upon the shift from knowing to unknowing, in which case the metainstance of a distance view is not present. It comes with the interiorized gaze and the uneasy self-reflexive work: is this alive, is this me?

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[28] Mladen Dolar, '"I Shall Be with You on Your Wedding-Night": Lacan and the Uncanny', *October* 58 (1991): 7, https://doi.org/10.2307/778795.

[29] The problem of the divided subject with regards to the Doppelgänger theory in literature (from German Romanticism to Postmodernism) and philosophy (from Kant and Fichte to Blanchot and Derrida), is further developed in: Dimitris Vardoulakis, *The Doppelgänger: Literature's Philosophy*, 1st ed (New York: Fordham University Press, 2010).

[30] Maria Kalinova develops the idea of *negative anagnorisis*, see: Maria Kalinova, 'Negative Anagnorisis: Notes on the Uncanny and the Metamorphosis in Kafka's *The Metamorphosis*', in *The Sublime and the Uncanny*, ed. Futoshi Hoshino and Kamelia Spassova, UTCP Booklet 27 (Tokyo: UTCP, 2016), 67–82.

[31] About the distinction between the logic of the tragic and the logic of the comical, see: Alenka Zupančič, 'On Love as Comedy', *Identities: Journal for Politics, Gender and Culture* 2, no. 1 (2003): 61–80.

[32] Alenka Zupančič, *Why Psychoanalysis? Three Interventions* (Aarhus: Aarhus University Press, 2007), 49.

If *unheimlich* is a point in time, then it is the point of unrecognizability; if *unheimlich* is a special category, it is the uncanny valley where the very notion of a separating line becomes ambivalent: the thing outside of the unexpected turns out to be the thing inside.

7. Unblocking the Difference

The line of the artificial being in the humanities' ever-changing perception passes through like Ariadne's thread in Miglena Nikolchina's theoretical books. The aim of Nikolchina's works is to redefine the very notion of *difference*. In her revision she doesn't Hegelianly reduce the antinomies to instances of mediation, nor does she follow Agamben's zones of indifference. Agamben's thesis about the dysfunctionality of the anthropological machine is especially important. Nikolchina finds an antidote for its inoperativity. Agamben's thesis is based upon the peculiar logico-political structure of inclusion and exclusion. He maintains that the line between human and unhuman is the act of exclusion — the human is not an animal.[33] That which, according to Agamben, gets stopped through the *animalization of the human* and *the humanization of the animal* is the anthropological machine's ability to establish an understanding of the human as a state of exception: the line between human and animal is erased.[34] The spot where Agamben suggests a zone of indifference,[35] is where Nikolchina attempts to find *differentia specifica* when defining the human. And she finds it in the automaton. Thus, she revalidates the separating line between human and unhuman but also transforms it. The figure of the unhuman shifts from the animal towards the robot. The line where one makes a distinction works, not through the exclusion operator, but through the montage of two different positions. In short, to be able to understand what a human is, we first have to understand what separates it from the machine. And if Agamben's anthropological machine is set in motion by the logic of the tragic, the sacrificial, and the exceptional, then Nikolchina proposes that the human be reconsidered by the logic of the edge between the comical and *unheimlich*:

> Frequently acting as a threat to humanity, robots deploy the paradox of the Doppelgänger, who can appear either as the comic twin or as the annihilating double, thus stalking the edge between comedy proper and the uncanny. The point in this case, however, is to single out the mechanism of reduplication that acts through montage and that posits an altogether different "anthropological machine". Instead of separating man from animal, this machine proliferates man's fake doubles.[36]

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[33] Kolozova, after Marx and Laruelle, proposes another vision. She suggests we think of a dyadic structure of technology and the organic as an inhuman kernel that precedes the subject: "The inhuman is that which escapes rational conceptualization, that which has no meaning or reason for existence: senseless, brute existence, mere matter regardless of whether it is organic or artificially produced. [...] In other words, subjectivity is always already philosophical. It is nothing but the automaton of signification which represents the human or constitutes it as representation; what makes it (non)human is precisely its failure to fully represent." The place of this inhuman rupture beyond representation and conceptualization is the Real in Lacanian terms. Katerina Kolozova, 'The Inhuman and the Automaton: Exploitation and the Exploited in the Era of Late Capitalism', in *Superpositions: Laruelle and the Humanities*, ed. Rocco Gangle, Critical Perspectives on Theory, Culture, and Politics (London: Rowman & Littlefield International, 2017), 92.
[34] Giorgio Agamben, *The Open: Man and Animal*, trans. Kevin Attell (Stanford: Stanford University Press, 2004), 36–37.
[35] Agamben's notion through which the paradigm of the exception is constructed, is often translated in English as "a zone of indifference", and as "a zone of indistinction". About the different effects between that and Deleuze and Guattari's concept "a zone of indiscernibility", see: Erinn Cunniff Gilson, 'Zones of Indiscernibility: The Life of a Concept from Deleuze to Agamben', *Philosophy Today* 51, no. Supplement (2007): 98–106.
[36] Miglena Nikolchina, 'An Unfinished Project: Man as Comedy', in *Lost Unicorns of the Velvet Revolutions:Heterotopias*

The robot can be a perfect copy of a human, his or her Doppelgänger (as Ishiguro proposes), a single virtual point, and yet, there is something that radically separates the human from the automaton. This *unheimlich* thing is definitive for what is human today— grasping it causes the difference.[37] In this turn, Nikolchina sees a shift of paradigms from the logic of the tragic (transcendent, in the dimension of desire) to the logic of the comical (immanent, in the dimension of the drive).
Why doesn't the perspective of man and machine becoming affinitive scare Nikolchina, how is it that she manages to not fall into the trap of the uncanny valley? It is important to point out that what some find *unheimlich,* others find comical. The comical arises from the possibility that the differences between two close perspectives is outlined, that the deceptive duplication of the heterotopic homonymies get recognized, and that the difference gets embedded into the process of heterogenesis itself. In other words, Nikolchina theoretically avoids the sacrificial-tragical logic, as well as the *unheimlich* logic which implies a point of indistinguishability that I here have presented here as negative *anagnorisis*.

The deautomatization of automatisms in the case of humans, as well as in that of machines, occurs in the critical act of recognizing, which induces heterogenesis and sees elements of various categories instead of a homonymous fusion. There is nothing fatalistic about Nikolchina's call to think of man as affinitive and distinguishable from the machines, but she insists that we do not stop to think of the human situation inside the context of the quickly changing field of technological innovation. After all, such an effort is to be made with the clear awareness that in the conversation between the strict sciences and the humanities, the latter have a lot more to say and have to be more creative when it comes to finding ways of being heard.

The whole story around the problem of M. Mori and H. Ishiguro's differing concepts in robotics can only confirm how important it is that the visions, such as that of Hoffmann, Jentsch, and Freud, be remembered. Masahiro Mori searches for an approach towards discovering artificial intelligence beyond the human form, while Professor Ishiguro focuses on overcoming the uncanny valley and designing the ever more flawless mimetic machines. The two robotics professors argue with one another imagining situations that have already been played out in fiction. To some extent, science simply carries out what has already been "invented" by literature, but there is a need for someone to remember, know about, and point out these links. These links need not be *liaisons dangereuses* as long as the possibility for a joint conversation is found. As it is now clear, coincidences should not scare us, they should prepare us for the task to critically analyse them, to distinguish between a number of similarities with the help of reflexive instruments and double vision which doesn't sublate the tension between heterogenic layers but expresses it.

of the Seminar: Heterotopias of the Seminar (Fordham University Press, 2013), 107.

[37] On a related note, Vassil Vidinsky makes an observation about mimetic machines as a human historical impulse towards self-knowledge. He thinks about a machine intelligence that is different from that of a human through the hypothesis of imaginary non-algorithmic machines that can approach our human nature in a better way. Vidinsky proposes the figure of *Homo sapiens technicus* from the 17th century onwards (a reconceptualization of the Baconian program), as he contemplates the historical shift of the natural, Vassil Vidinsky, '(Post)Phenomenological Approach to Homo Sapiens Technicus', *Balkan Journal of Philosophy* 12, no. 1 (2020): 31–36, https://doi.org/10.5840/bjp20201215.

Nikolay Genov

AN ESSAY ON THE MACHINES' DISCREET REBELLION

Abstract

This paper conducts a comparative analysis of Samuel Butler's seminal work, "Erewhon, Or Over the Range", and Vladimir Poleganov's contemporary novel, "The Other Dream". The analysis centers on the discreet influence exerted by technology in the pursuit of territorial survival. The study delves into the catastrophic consequences arising from both the success and failure of this technological endeavor.

Keywords: artificial intelligence, machine rebellion, space and territory

"All spaces with regular form... geometric imprints of our lives, rather than, as I most often explained to myself about unclean places – reflections of their geometric, mechanical fear with coordinates clear only to them"

"The Other Dream", 2016

The anniversary of the official beginning of the Anthropocene is celebrated with a lavish festival, and everything on its territory is intended to testify to man's superiority over the domesticated and now completely disempowered environment: "The sands covering the earth were particles of sufficient intelligence that they did not stick to our bodies and tasted pleasant in case they got into our mouths; the rocks jutting out here and there could translate the memory of their ancient originals into a language we could understand, and every time we touched one of them with finger or palm we could see in our heads how fossils had become fossils or how earthquakes had rearranged the world. [...] The flames burned quietly, without crackling or popping, their beauty for the eyes alone. Their warmth, too".[2] This, at least, is how the world looks through the eyes of an imperfect and defective mind, an incomplete narrator whose ontological status remains unclear. Is he alive, or is he already dead? Is he a man, or a machine? Is he a phantomized subject[3], or merely an informational echo, a ghost reflected in the unblinking eyes of optical devices?

Vladimir Poleganov's novel *The Other Dream* does not give easy answers, but it does pose interesting questions and draws the reader's attention to some of the long-standing themes of science fiction literature. The depth of the book becomes an invitation to a conversation with the past, the stakes of which are, as is usually the case with such narratives, the future itself. This is also why it is difficult to isolate a particular motif without sacrificing the exemplary ambivalence of the story. Yet the present paper intends to perform just such a maneuver – to narrow the interpretive field and focus on one of the novel's more complex elements in order to bridge the gap between the anxiety of Erewhonian scholarship and the helplessness of Poleganov's fictional character who is no longer able to decipher the boundaries of his own world... or at least of what he perhaps too naively still perceives as 'his' world. Key to the analysis will be the technological possession of human space,

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[2] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, p. 118.

[3] Phantomatics could be defined as a particular type of digitalization and it's tied to the notion of virtual reality. The concept was proposed by Stanislaw Lem and is discussed in more detail in my monograph *The Virtual Human: An Essay on Phantomatics*.

the latter being understood as terrain and possibility for independent (unmediated) action, but also as goal, conquest and currency, a barter or ransom for progress; a rather peculiar definition, intending to remain in the realm of literary studies with two works published in the nineteenth and twenty-first centuries.

When the first edition of *Erewhon, or Over the Range* appeared in 1872, the Victorian community perceived the most thesis-laden part of the novel, inserted under the title *The Book of Machines*, as a mockery of Darwin's theory. Samuel Butler, however, remained perplexed by this reading. After renouncing his anonymity and disclosing himself as the author of the text, he added the following clarification to the preface of his second edition:

> I regret that reviewers have in some cases been inclined to treat the chapters on Machines as an attempt to reduce Mr. Darwin's theory to an absurdity. Nothing could be further from my intention, and few things would be more distasteful to me than any attempt to laugh at Mr. Darwin; but I must own that I have myself to thank for the misconception, for I felt sure that my intention would be missed, but preferred not to weaken the chapters by explanation, and knew very well that Mr. Darwin's theory would take no harm. The only question in my mind was how far I could afford to be misrepresented as laughing at that for which I have the most profound admiration.[4]

Moreover, on May 11, 1872, the writer sent a letter to the famous naturalist apologizing for the critic's shortsightedness, a gesture that marked the beginning of a brief friendship consisting of annual meetings and conversations about science, literature, and art.[5] The rift between the two in the 1880s did little to help Butler's aspirations to prove that the potential application of theory, rather than its substance, was the true object of his satire.[6] And so, initially misunderstood by the general public, by 1901, when the revised edition of *Erewhon* appeared, the author was now quite deliberately prepared to challenge the 'purely mechanistic' understanding of evolution by endorsing Lamarck's teleological thought.[7] The implications inherent in this philosophy indicated that the machine possesses the capacity to supplant humans. While currently appearing to serve humanity, the trajectory of its development and its inherent potential for self-directed change created conditions for divergence from its creator, akin to the evolutionary divergence observed between animals and plants, albeit at a notably accelerated pace. Such seemed to be the course of nature, and "surely when we reflect upon the manifold phases of life and consciousness which have been evolved already, it would be rash to say that no others can be developed, and that animal life is the end of all things. There was a time when fire was the end of all things: another when rocks and water were so".[8]

In a sense, a very old motif underlies the history of this debate, the basis of which is the human fear of the creation turning against its master and refusing to obey his commands. Such

[4] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 4.
[5] Turbil, Cristiano. (2019) Memory, Heredity and Machines: From Darwinism to Lamarckism in Samuel Butler's *Erewhon*. *Journal of Victorian Culture*, Vol. XX, № XX, p. 6.
[6] Turbil, Cristiano. (2019) Memory, Heredity and Machines: From Darwinism to Lamarckism in Samuel Butler's *Erewhon*. *Journal of Victorian Culture*, Vol. XX, № XX, p. 6.
[7] Turbil, Cristiano. (2019) Memory, Heredity and Machines: From Darwinism to Lamarckism in Samuel Butler's *Erewhon*. *Journal of Victorian Culture*, Vol. XX, № XX, p. 2. See also Breuer, Hans-Peter. Samuel's Butler "The Book of the Machines" and the Argument from Design. – In: *Modern Philology*, Vol. 72, № 4, 1975, pp. 365 – 383.
[8] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 278.

plots are familiar to us from Antiquity – we can find them in, say, the living statues ('automata') of Daedalus, which their creator had to bind to prevent them from escaping him[9], or in far more recent narratives - such as James Cameron's *Terminator* series, Alex Garland's *Ex Machina: God from the Machine*, and many others. Yet, by being an exemplary example of social critique, *Erewhon* also manages to bring in an additional, particularly pertinent question: is it possible to step back and relinquish technological development, or is it already too late for that?

Liberated from the economic pressures of global competition owing to their geographical isolation, the Erewhonians have responded affirmatively by collectively deciding to halt 271 years of technological advancement. This resolution, however, followed a tumultuous civil war that not only marked a significant historical event but also solidified a prevailing anti-machine sentiment among the populace. The conflict was anticipated but proved unavoidable since "to withdraw steam power suddenly will not have the effect of reducing us to the state in which we were before its introduction; there will be a general break-up and time of anarchy such as has never been known; it will be as though our population were suddenly doubled, with no additional means of feeding the increased number".[10] Nevertheless, people were convinced that "the air we breathe is hardly more necessary for our animal life than the use of any machine, on the strength of which we have increased our numbers, is to our civilisation".[11] Inaction, therefore, directly conflicts with the instinct for self-preservation, leading to the plea from the *Book of Machines* for humanity to rid itself of material comfort in the name of species preservation. "I shrink with as much horror from believing that my race can ever be superseded or surpassed, as I should do from believing that even at the remotest period my ancestors were other than human beings", confesses the fictional author of the philosophical treatise, before pronouncing his severe verdict, conveyed to us by the narrator's translation.[12]

The machine mind, to summarize *Erewhon*'s version, has already entangled humanity in its tentacles (or perhaps wires, as long as we don't feel too sharp reservations about updating the image) through the use of artifice (in the sense of subterfuge) on which its own survival depended. "The misery is that man has been blind so long already".[13] And although it is "true, from a low materialistic point of view, it would seem that those thrive best who use machinery wherever its use is possible with profit"[14] it is important to remember that "this is the art of the machines—they serve that they may rule. They bear no malice towards man for destroying a whole race of them provided he creates a better instead" [15].

But will there be room for all species if their numbers continue to grow exponentially? It is as if "man's very soul is due to the machines; it is a machine-made thing: he thinks as he thinks, and feels as he feels, through the work that machines have wrought upon him"[16] and yet in the same time "their [the machines] existence is quite as much a sine qua non for his, as his for theirs"[17]. What then

[9] Kang, Minsoo. *Sublime Dreams of Living Machines: The Automaton in the European Imagination*. Cambridge and London: Harvard University Press, 2011, p. 20.
[10] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 312.
[11] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 312.
[12] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 315.
[13] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 312.
[14] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, pp. 290 – 291.
[15] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 291.
[16] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 290.
[17] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 290.

would be the fate of the losing side?

One of the more in-depth interpretations of this issue emerged in 2016 – in the aforementioned novel *The Other Dream* by Vladimir Poleganov—where the theme is explored and enriched through a skillful combination of some of the best science fiction practices developed over the years.

The protagonist of the novel is shown to be confused, frankly disoriented, helpless, demented and depressingly anaemic; charmless and uninitiative, detached and unreliable. His unintentional wandering between two mutually exclusive worlds, between waking and sleeping, between life and death, the real and the phantomatic, the imaginary and the actual, turns out to be a speculative experiment, a "miracle" facilitated by the activity of new technologies and their capacity for error. For error here is productive; it is a glitch that generates otherness (not difference, but otherness) and allows an anthropomorphic consciousness to approach the otherworldly but not to glimpse it. Insight, however, is almost there; it appears in the form of fragmented observations that betray the impenetrability of technically mediated existence, of the technological trap or of the ultimate human defeat that – purely dialectically – has turned into a new possibility for our species:

> [...] somewhere something has sprouted – a desire or just an image that you see in your mind as a solitary letter from a completely alien alphabet and you don't know what it means - and it has perhaps taken on a life of its own – like a tumor, but benign, because it has not invaded your body in its incomprehensible march, but has tuned it, prepared it for this moment.[18]

The narrator's lack of comprehension has rendered him blind to the subtle machinations of the machines. In this state of non-understanding, he remains oblivious to their discreet campaign against man, their gradual encroachment upon and occupation of the space they claim. These machines systematically seize, process, sanitize, and ultimately strip away the essence of humanity within that space. "Someone is talking, you can't hear, but you know you'll remember what they said"[19], declares his wife, who, like him, has delegated much of her memory (and thus herself) to the devices that surround her.

> I can only wait and look out the window. When I shared this with my wife, she again explained it with technology. There is not an inch of our home, she told me, that is not populated with technology. Scientists are making them more and more invisible. Sometimes what you think is dust is just a device that monitors your body's needs and, say, turns on the stove just before you feel hungry.[20]

Man's identity, to put it more bluntly, has been violated, and the sanctuary of his home environment – that intimate space fostering self-reflection and interpersonal connections – is under siege, marked by destabilization and insecurity.

> "To this day, I don't understand why I think our home offers me a kind of security, a security of the senses that seems to be the only thing that keeps me in this world.

[18] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, p. 44.
[19] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, p. 30.
[20] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, pp. 10 – 11.

> Maybe it's because technology in our country is convincing enough. Maybe that's why I rarely find myself unable to fall asleep in bed at night, tossing and turning, sweaty and exhausted, thinking a thought a thousand times: surely the particles scientists put in the sheets help my body and mind more easily swim the river between days".[21]

Yet to question what is "truly" unfolding in the novel often implies overlooking its enigmatic, multilayered narrative and favoring a singular interpretation, thereby disregarding the diverse perspectives that contribute to the work's inherent fascination. Nevertheless, such decisions are frequently deemed necessary, and the current paper is on the verge of making one.

The Other Dream can be read as an intensification of Butler's already radical assertion that "the very soul of man is due to machines: it is made of machines"[22]. It is no longer clear who is the constructor and who is the constructed, for the two are intertwined to the point of unrecognizability. The synthesis, however, is paradoxically too flawless to be deemed perfect; it can only be completed through the rupture of a matrix or the failure of a function: the inverted vacuum cleaner (or, more precisely, the inverted cleaning machine) becomes visible, draws the eye to itself, reminds us of its existence:

> When we got home, we found one of the cleaners on its back. It was the smallest one, the one that looks like a spider and can climb on the furniture. That's what made its turning suspicious: it was designed to move at slow and fast speeds upside down wherever its head was: it could swim, unclog drains, it could probably do a thousand other things I didn't suspect. Such machines don't stay on their backs for long.[23]

Similarly the other world itself, that strange space into which the protagonist often lapses, becomes visible only thanks to cognitive discrepancies, to the discrepancies between human and non-human reason: "If I got used to it, this world and my world would be equal [...] I don't know if I want to get used to it"[24], the traveller concludes. But what, after all, is this alternative world? A virtual reality, or more precisely a phantomized fiction that "wants you so much that [...] it transports you into itself whenever it wishes, and then [...] leaves you alone and always before the first step"[25]? Quite possibly. But why and for what purpose does it exist?

One of the applicable interpretations[26] in this case is that the protagonist's wife makes digital sectors in which she stores the disappearing species, and her husband, who died some time ago, is collected thanks to the "correct forms" that the cleaners' programs ignore:

> The place where we found it [the inverted cleaning machine] was a place which was shunned by the machines [...] The line under the cabinet was covered with a very thin but visible layer of dust.[27]

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[21] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, p. 11.
[22] Butler, Samuel. *Erewhon, Or Over the Range*. Planet PDF [eBook], 2005, p. 290.
[23] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, p. 31.
[24] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, p. 52.
[25] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, p. 52.
[26] This line of reflection arose in an informal conversation I had with my colleague Iva Stefanova, and as the laws of good manners dictate, the author neither accepted nor rejected it.
[27] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, p. 31.

> Then why, I once thought to ask my wife, do we clean? If dust is technology, why are we cleaning? Only some of the dust, she said, the rest is miscellaneous debris from our bodies and objects in the house. Still, I insisted. After all, remember that the machines that clean are technology too. You don't mistake a doll for a person, do you?"[28]

If one is to accept this interpretation of the text, then one might also agree that the Erewhonian thinker's fears have come to pass in the world of *The Other Dream* and humanity is now enslaved – not destroyed, not forced to perform impossible physical or mental labor, but removed from the equation, disarmed, disempowered, and marginalized on the fringes of the simulation. The intertwined implications and the produced meaning cannot easily be separated from one another, as the anthropocene is necessarily and by default an automatocene. But space is finite, its materiality on the wane, and so phantomatization appears as a natural extension, a digitized container collecting the residual waste of human activity. The process is invisible; it becomes tangible only thanks to the insufficient corporeality, to the disintegrating information that fails to identify the two poles through the illusion of life. Yet technophobia remains alien to the novel, which, instead of following the fiery shadows of the Butlerian Jihad[29], reaches for the beauty of the legend of the spaceships buried beneath the sand, destined to take human souls to a better place:

> I grabbed the branch and the stone again and went forward. I reached the spot and started digging. First with my hands, but the dirt quickly brought them down. Then with the stone, but it didn't work. Then with the branch, but I didn't have the strength anymore [...] It was stupid to stop trying to drive such a change from here, with these hands. It was also foolish to stop after I had already torn the branch off, after I had heard my wife's last words leak through the sieve that had separated me from her, after Oa's rescue was the only way I could prove to myself that I had stepped from life not to death but simply to the other world. The next world.[30]

It is plausible to assume that the dream of immortality, that lifelong fantasy of the transhumanists, drives the narrative, and that the novel's discrete technological excess is merely a tool for achieving it; after all, the protagonist (or at least his consciousness) has been digitized by a man who is trying to preserve it, even if the attempt to do so has been largely unsuccessful. But in that case we must ask what are the premises that led to this unnatural experiment. To conceive of machines as hostile terminators would be to simplify their presence and ascribe to them a moral responsibility that they could hardly assume on their own. It would be more precise to think of technological "harmfulness" as an expression and trace of the actions of others who use the machines, because the machines must be used so that they can ultimately rule. The very core of this governance, or its stake, is space, and one of the tactics of its absorption is the creation of an artificial environment, directly dependent, that is, maximally controlled, on the activity of the winners. The Erewhonian monarchy is an example of human domination reducing machine presence. *The Other Dream*, conversely, represents a reduction of the human against the background of technology. Both works,

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[28] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, p. 11.

[29] *Erewhon*'s influence on other artistic works in the field can easily be recognized in beloved works of fiction such as the *Dune Chronicles*.

[30] Poleganov, Vladimir. Drugiyat san. Sofia: Colibri, 2016, pp. 165 – 166.

however, demonstrate that space, whether material or digital, cannot function fully autonomously due to the symbiosis between man and machine; each party is a tool of the other and as such must find a place for its necessary competitor. Moreover, both versions, which could claim different genre signifiers[31], can present a similar signified – a dystopic scenario[32] brought about by some kind of an ecologically-oriented action that disturbs or prolongs the natural order of things. And both iterations manifest a shared resolve to present a distorted reality, displaying a specific structural symmetry. Primarily, it is through this symmetry that the widely acknowledged societal apprehension, particularly the fear of machine rebellion, undergoes rejuvenation, articulating its concerns with renewed vigor, and also it is due to it that the comparative approach establishes its foundational premise.

It can be argued that the comparative reading of the two novels puts the reader in a particular position that allows him to think of the relationship between man and machine tactically – as a doomed struggle for territory[33]. It is not impossible, however, to imagine a definitive end to it, as Poleganov does:

> If technology on Earth, as some scientists claim in the articles my wife has read from time to time, is moving towards some kind of peak already without the crutches of human minds, then it is logical that they will one day wish to leave home. It has been the same with humans, but they have not succeeded. Except that if technology proves to be more successful than us and leaves the planet, we will be left not as part of nature returning to its purity, but as ghosts, remnants of the technological spirit, a residue of the unnatural, so I think. The same, it seems to me, will happen if somehow we humans evolve and leave the world before technology.[34]

The territorial skirmish, then, turns out to be only a phase of a larger contest that links *Erewhon* and *The Other Dream* even more poignantly to the anxieties (and hopes) of science fiction literature.

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[31] For an intriguing play with Erewhon's genre see Parrinder, Patrick. Entering Dystopia. Entering Erewhon. – In: *Critical Survey*, Vol. 17, № 1. Representations of Dystopia in Literature and Film, pp. 6 – 21. For a debate over the genre of *The Other Dream* see Kyosev, Aleksandar, Miglena Nikolchina. Bavnoto chetene: Vladimir Poleganov, *Drugiyat san*, IK „Kolibri", S., 2016 g. https://newspaper.kultura.bg/bg/article/view/26188 (11.02.2024, 21:01).

[32] It should be noted that neither *Erewhon* nor Poleganov's novel could easily be classified as dystopias, and it is not my intention to do so. The link between these two works is too fragile to carry such a generic burden. What I am trying to imply here, however, is that there is a certain dyschronic impulse that fleets between these two texts with the inevitability of a sentence. The notion of dyschronia I discussed in an article published in *Philological Forum* under the title *Between Alternative History and Temporal Utopia: The Uchronic Potential* (issue 1 (17), year 9 (2023).

[33] The motif did not remain foreign to the 20th century, as eminent authors like Stanislaw Lem created truly impressive texts by incorporating it in their work. See Lem, Stanislaw. Two Evolutions. – In: *Summa Technologiae*. Minneapolis, London: University of Minnesota Press, 2013, pp. 11 – 40. See Lem, Stanislaw. *The Invincible*. Cambridge, London: The MIT Press, 2020.

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TRANSFORMING KNOWLEDGE: CONCEPTS OF TRANSCULTURAL STUDIES AND DIGITAL HUMANITIES

Transforming Knowledge: Concepts of Transcultural Studies and Digital Humanities

Chapter · March 2019

DOI: 10.4324/9780429430060-32

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Transforming Knowledge: Concepts of Transcultural Studies and Digital Humanities

Armin Volkmann

Abstract
This article discusses perspectives of digital-based research in Transcultural Studies. Following a brief definition of Digital Humanities, several possibilities for cooperation within transcultural studies are presented; these may be based on data- or theory-driven approaches. Fundamental to the design of digital-based research projects is the differentiation of methods, procedures and tools in Digital Humanities which enable different levels of digital data collection and analysis.
The progressive digitalisation of scientific enquiry offers new opportunities for collaboration and the exchange and creation of knowledge based on non-centric, complex datasets. With location-independent Virtual research environments (VREs), data previously inaccessible via the internet can be made available in digitally-curated collections. Data standards are necessary which not only permit access, but also fundamentally ensure comparability and therefore enable contextualisation with other datasets. Cultural aspects which influence data quality and can therefore limit evaluation possibilities are then particularly relevant for data collection and processing. Digital Humanities confront these considerable challenges to both the establishment of internationally-applicable standards and the analysis of very heterogeneous data common within the Humanities and Social Sciences with appropriate preparation and evaluation.
This generally occurs methodically with a discipline-specific approach in cooperation with the Digital Humanities. In this way, digital-based methods are disseminated from Digital Humanities and applied computer science into transcultural studies in response to existing research questions. This cooperation is a mutually-beneficial one when methods in Digital Humanities as well as those in use in transcultural studies are simultaneously refined. The theoretical concept in development constitutes a specific adaptation–the development of Digital Humanities in cooperation with transcultural studies. Digital Humanities are particularly appropriate for collaboration with transcultural studies as both disciplines are anchored in internationality and because the concept of transference, whether cultural or digital, is of central significance.
Following this introduction, this article will present case studies of successful collaborations between Digital Humanities and historically-oriented disciplines within Cultural Heritage which, irrespective of these specific applications, can also inspire new perspectives in Transcultural Studies.

Introduction

The field of digital humanities (DH) closes the gap between the humanities and applied computer science. It provides an interdisciplinary and transcultural approach to research potential and outcome. Digitally-based studies derived from data repositories and research data, for example, are available and are not location-specific. Currently, so-called international data standards which vary due to different cultural backgrounds across regions are difficult to use and are often of limited use to international (cross-regional) researchers—in the field of cultural heritage, for

instance. Human involvement in data makes data heterogeneous. It is almost impossible for an international community to work with, because of the different local data formats and cultural taxonomies. This complicates transnational and also transcultural studies, research and development. Transnational standards, and one day, perhaps, international standards are necessary to improve and optimize research potential and impact. For this reason, DH aspires to establish and promote standardized terminologies of cross-regional standards (Maisen 2007: 223–243). In the course of the 'Spatial Turn' in the humanities and social sciences, numerous research projects with a strong spatial component emerged in different disciplines over the last few years. Spatial investigations focus on Geographic Information Systems (GIS) to visualize and analyze research data with respect to the formation of transcultural processes. Such spatial research corresponds closely with DH and transcultural studies addressed by the same researchers in both disciplines. The use of GIS in transcultural studies helps to generate new research perspectives and questions, resulting in contextualized analysis of past, present and future space of investigation. DH also helps to analyze intellectual networks, for example in the context of a discipline-specific discourse analysis, or to investigate spatial links and interactions. Databases containing enough data can provide the basis for the creation of a GIS and statistically verifiable studies. With the aid of digital tools, large datasets can be accessed and analyzed. The kind of large datasets useful for these analyses may be compiled specifically for project needs, e.g. interviews or textual analysis, which limits its usefulness for other researchers trying to answer different questions. So standards in data structure help to make datasets accessible and inter-operable (Warwick *et al*. 2012). Methods of DH enable the exploration of pre-existing sets of 'big data', like library catalogues that include extensive metadata. Based on the latter, discipline-specific ontologies can be created that structure existing knowledge in the form of networks. In the context of transcultural studies, DH is working simultaneously with disciplinary research questions and data, incorporating quantity and quality, and improving standards on both sides of the academic standoff between the humanities and informatics.

Effects of Transcultural Globalization and Digital Humanities

Digital humanities is still a very young discipline in continental Europe and in Asia, and one which occupies the intersection between the humanities and computer sciences in addition to its distinct interdisciplinary. It is fairly international due to the absence of the typical regional focus in its ongoing development (Sahle 2013). On the contrary, DH is a good case in point for the progressive, interactive creation of a new, deliberately dynamic and especially international, discipline, which develops decentralized in a global context. While there are certainly regional differences in the expression of or emphasis on DH, attempts at a universal resolution are controversial.[1] It is however precisely this complexity which is DH's main feature, as it is based on the processing of heterogeneous data (text, image, audio, video, and measured) from very different disciplines in diverse cultural contexts. Additionally, the dialogue between the humanities and computer science provides a welcome support to the bridging of existing communication gaps in the frame of digitally-based studies. Similar to the transcultural approach to research,[2] disciplines often distinct from one another are brought together in DH to constructively permeate research barriers and dogmas in a mutually influential manner, thereby leading to new insights. This

defines a clear paradigm shift which accompanies, and is itself, a component of the constant digital penetration of society and research.

The fundamental transformation inherent in the globalization of research is quite apparent in DH, in so far as many digitally-based studies are derived from data repositories accessible internationally via the internet, and collaboratively analyzed in research groups' web-based, virtual environments. This approach means that the location of a colleague or team in the research group is no longer of principal importance to project discussion or the coordination of other workflow. In addition to the digital and, in this case, location-independent availability and usability of research data, the processes of research communication are similarly new and allow new opportunities, as well as risks, which must be developed and considered in advance. Examples here could include contemporary and practical e-publications which enable faster dissemination of globally accessible knowledge based on articles and linked data. The mechanisms of quality assurance which allow this to occur, apart from more traditional publication and editing processes, must however be guaranteed within a transparent review process.

Alongside basic research on the methodological development of large digital repositories (Schreibman *et al*. 2004: chapter 37), the question of data security of pre-existing as well as newly acquired data is also of central importance in the focus of DH in a global context. The societal 'digital turn' (Kossek and Peschl 2012) also ultimately stands out in research as a generation of classical researchers with only rudimentary digital competencies ('digital immigrants') is replaced by one of 'digital natives'. And research objects are increasingly available as primarily digital sources ('digital born'), instead of being in analog or retro-digitized forms. This transformation now permeates almost all cultural levels—particularly the digitally networked and thereby global transculturality which has considerably increased through this process of digitalization worldwide.

Digital Humanities: Methods, Procedures and Tools

A DH-method describes an approach that is systematic, based on rules, and combines reflexive and practical elements with one another. By applying the methods gained, research results will be validated towards better provability and replication. Methods claim different levels of validity: they can be generic, so that they are transferable to other disciplines and similar in the research topic. They can also be very specific and project oriented, whereas their transferability is not, or is only possible within certain limits. DH-research methods are defined by the nature of research topics and the structure and type of research data on which they are focusing to answer specific research issues. On the one hand, research methods are always oriented towards specific research topics, while on the other hand, they simultaneously imply generic interdisciplinary supporting knowledge.

Therefore, DH-procedure can be described as a systematically planned and practice-oriented approach to available digital research data. In a typical DH-project, the research method normally consists of the sum of several DH-procedures. A solution can be reached after having asked the respective discipline-specific research question, while making use of a defined and standardized workflow. Some DH-procedures can also be used together with other DH-methods if they have been designed generically for heterogeneous data. The structure of digitally transformed (retro-digitized and primary digital/'born digital') research data and the directions of scientific focus on metadata determine the type of processes involved. The type of

processes can be categorized as follows: conceptualization, collection, discussion and publication.

DH-tools (software and/or virtual research environments that combine software collections, data repositories and tutorials) help to process and analyze digital research data depending on their questioning of the methods as part of the procedure. The possibilities and the existing limits of the tools have an effect on the applied procedures. But a necessary procedure can also lead to the targeted development of required tools. Therefore, tools and procedures are standing in direct and constant interaction of a dynamic ongoing hermeneutic spiral of development. The usage of research data and their discipline-specific object relation is fundamentally developed by digital procedures and associated aggregation of new knowledge. This is one of the greatest challenges of DH-based research with the standardization of discipline-specific norm vocabularies and ontologies of contextualized data (linked data).

Transforming Knowledge in a Digital Transcultural World with Concepts of DH and Digital Cultural Heritage

The development of DH-methods is an ongoing process with constant development of data standards, and rapidly changing components of information technology like network infrastructure, hardware and software, and equally swiftly, obsolete DH-tools and applications. Specific research data such as digital text, images or videos require methods as well as underlying theories which intentionally take into account the characteristics of the data and so exploit the information contained. Thus, fundamental data aggregation is not without its problems, particularly when currently valid international data standards try to be applied. The more or less standardized 'correct terminology' always refers to a cultural context which can be quite variable within even a single country with regional cultural identities. These problems are not unusual, particularly in the fields of cultural heritage or cultural studies as the following example explains.[3]

In the framework of digital cultural heritage,[4] artefacts and historical and archaeological sources are digitally captured, processed and evaluated. Increasing difficulty in the use of standardized terminology is founded through, among others, dates according to different chronologies, varied coordinates systems, or source categorizations. Archaeological and historical data is by nature heterogeneous flawed information, and thus digital registration, preservation and investigation provides a minefield of potential problems. In Germany, for example, cultural heritage includes the sovereignty of the 16 federal states, the unification of which is fundamentally contrary, and as a result is regulated by more than 16 different glossaries and standards. Similarly difficult is the utilization of historically-oriented databases from Germany and France which cannot even begin to be put into common context without extensive data reconciliation. These are currently considerable challenges which cannot be solved with simple and thereby regionally-oriented data delivery. In order to do so, we need intelligent research infrastructures which can deal with partly heterogeneous (regionally-oriented) standards. Concepts of linked data models could be promising solutions for cultural heritage and cultural studies as well (Freitas *et al.* 2012).

As such there exist two contrary aspirations in the digital, globalized research world, with digital data repositories which fundamentally influence the speed of data access, and the evaluation and ultimately the accumulation of new knowledge. First, many previous digitization projects present culturally typical regional

expressions and are therefore of limited use to international research characterized by varied cultural backgrounds and cultural identities: consequently, also of little international relevance, which is a dialogue-oriented challenge. Second, only a few such projects take into account previously transcultural aspects in the data preparation and structuring phases, not only through the utilization of international standards, but also by the implementation of internationally understandable terminologies/thesauri and ontologies, as well as metadata. These few then permit international contextualization and subsequent generation of knowledge.[5] The creation of worldwide accessible 'digital knowledgescapes' is one of the biggest challenges in the context of digitalization (Cameron and Robison 2007: 165–91).

Spatial turn and Spatial Humanities

The so-called 'spatial turn' (Warf and Arias 2009) proceeded quite differently in individual disciplines within the humanities and arts. Under this premise, diverse spatial features are the primary focus of research and frequently geographical methods (like the use of a geographic information system GIS) are adapted and more or less modified for the respective discipline. This occurred in archaeology, for example, in the 1980s and 1990s, and in historical studies shortly thereafter (Conolly and Lake 2008). Numerous language and literature studies projects with spatial references emerged similarly in the new millennium. The spatial turn, if it has occurred, represents a 'turn' in a given subject, and is furthermore of great interest in many disciplines within humanities and cultural studies. Over time, this came to be concisely summarized by the term 'Spatial Humanities', which all research questions on spatial reference have in common and mostly address with quantitative and qualitative methods (Bodenhamer 2010). This approach is also ideal for the visualization of cultural questions and the formation of transcultural processes over space and time as a basic answer to how a GIS[6] may be applied in transcultural studies. In this way, spatial humanities works closely with DH, and are typically addressed by the same research groups from history, archaeology and geography. Such approaches base quantitative research on a database system which also represents the foundation of a GIS and allows the subsequent spatial (not only statistical) analyses;[7] but, is simultaneously also the foundation for related web applications, including digital publications and virtual research environments (consisting of repositories, toolkits and tutorials).

Space and Transculturality

Equating nineteenth century concepts of the state with cultures, in this context alleging uniform and monolithic cultural identities or ethnicities, was politically motivated and has been developed within the concept of the nation-state of defined cultures (see fig. 1). Geopolitical cultural differences were (and are) seen in Europe in the last century as associated with state borders and serving to justify nation-state territorial claims. This is fundamentally contrary to the transcultural research approaches presented here and is emphasized within their combined (and transformed) rather than divided cultural elements, whose spatial features can be similarly mapped and analyzed in a GIS.[8]

Cultures are ever-changing and consequently depict numerous cultural elements like language/communication, tradition/religion, politics/socioeconomics. As

a result, it is to a large degree only possible to visualize single aspects for simple geo-browser mapping from more or less subjectively selected elements of cultures. By contrast, GIS maps can visualize complex information composed of individual cultural elements in implemented databases far more reliably but, above all, can also analyze it contextually and thereby generate new knowledge which can be empirically supported. In this way, the consistent use of a GIS in transcultural studies presents an especially high potential for the creation of new types of knowledge. This, in graphic format, further makes highly complex, ever-changing cultural transformations more comprehensible. Thus, GIS permits interactive and contextualized analyses with reference to spatial features. This reference can be further explored in two, three, or four dimensions, the latter including a temporal component (such as a timeline). GIS enables new forms of worldwide location-independent cooperation of research groups, and collaboration with end-users within crowdsourcing-based projects (Ridge 2014).

At the time of writing this paper, however, such studies are largely an exception rather than the rule in arts and humanities. Pioneers include archaeological and historical studies where complex spatially-specific analyses have become part of their standard methodology repertoire over the last decades (see, for example, Harley [1989, 2001]). They do not, however, hold a monopoly, because there are some GIS-based projects from the past decade with a temporal aspect in philology/literature studies (Piatti and Hurni 2011). And such projects present a number of new conclusions, like the emergence of a literary work or the associations between communication structures and interactions of different authors.[9]

GIS Construction, Components and Methodologies

A GIS basically consists of four components: software, hardware, data and user; as such, software is only a component of the entire GIS. It is also sometimes more generally termed a geoinformation system, taking the name from geodata themselves rather than their spatial distribution. GIS serve for the collection, processing, organization and administration, analysis, and, in addition, presentation of spatial data. Until a few years ago, one had to acquire quite expensive GIS software, the licensing agreements of which were seldom affordable by smaller departments or research groups on a permanent basis. Only the continuous development of more stable and user-friendly open source GIS software made spatially-oriented studies feasible for a considerably greater group of users in humanities.[10] Similarly, the availability of high-performance hardware in commercial PCs fundamentally enabled GIS usage. The real-time calculation of zoomable grid mapping of georeferenced image data (bitmaps) such as digitized maps, particularly, requires substantial computing power and therefore random-access memory (RAM), both of which were, until a few years ago, not readily available.

Furthermore, the availability and applicability of geodata through appropriately implemented GIS tools has also considerably increased in recent years, a change which has been accompanied by increasing numbers of GIS studies. Many topographic map series and even historical maps have, for example, been accessible for the past few years from web-based repositories in compliance with the implementation of the European Union's INSPIRE Directive for the establishment of usable geodata infrastructures.[11] The same aspirations for web-based accessibility of geodata are also apparent on a global scale.[12]

A modern GIS is not a simple collection of different geo-tools but, in the sense of a virtual research environment, may contextualize heterogeneous data of hybrid origin. Only by bringing together these often widely dispersed data from different repositories may new research questions be fundamentally generated and associated with the development of new methods. Typical for a GIS is the interplay of tools and methods: new tools often go hand in hand with new methods and, similarly, new methods necessitate the programming of new tools.

Many theories and methods have been developed by geographers and geographic computer scientists, primarily for their disciplines. The transfer of a method from one discipline to another however often requires specific adjustments which can be problematic if, for example, data are not based on empirical measurements or international standards, but rather, on hermeneutic or interpretative data representing a special source with special challenges (see below). Such transference requires the examination of information about processes of understanding and interpreting individual data which, also, as paradata,[13] describe the circumstances of data collection.[14] In this way, methods from geosciences can be adapted with specific adjustments; specific methods appropriate for datasets from social and cultural studies and their respective incompleteness and imperfection must first be formulated. GIS revolutionize the classical research approaches of the humanities, inasmuch as they present not only the pure visualization of spatial distributions on maps, but also an analytical platform for collected data, and can additionally serve as records in the form of a catalog of the databases utilized. The foundation of a GIS are data tables in a database system which have a unique, georeferenced spatial relationship and can also be used by other tools (e.g. statistics or word and image processing) within and without the GIS. The basis of a GIS therefore comprises, in addition to interdisciplinary methodological research approaches of many users, interoperable datasets through implementation and homogenization of heterogeneous data which increase its potential (see fig. 1).

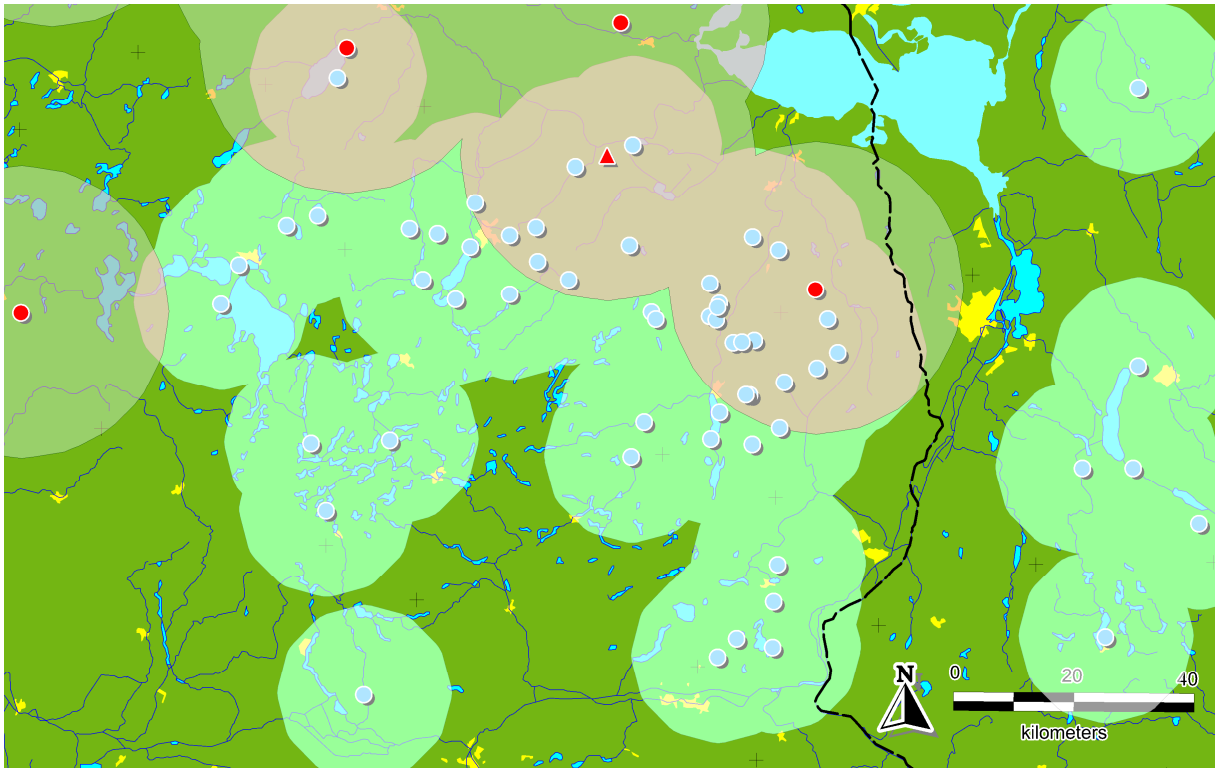

Figure 1: Buffer map of finding sites in the GIS. Mapped in the GIS are the archaeological sites dating probably to the 7th century AD in the lower Oder region at the modern-day border between Germany and Poland (black broken line). Until recently, archaeological features were identified in site reports as being either ‘late Germanic’ or ‘early Slavic’. This terminology, however, has nothing to do with the ethnic groups depicted, but rather refers to the attribution of these features to one of these two archaeological cultures. These cultures are defined by an incomplete selection of characteristics such as material culture or funerary traditions, and should not be equated with a recent cultural group. As a result, the physical juxtaposition of these two ‘cultures’ on the map suggests that no ‘late Germanic’ features have been observed east of the river Oder, apparently coinciding with the modern national border—the map serving to display a classic case of circular reasoning.
Furthermore, and because of often only broadly-dated finds (pottery, etc.), the certainty of contemporaneity, a crucial prerequisite for a period-specific, mono-dimensional map, is not guaranteed. The map then displays neither ‘cultural sequence’ nor ‘cultural expansion’ or ‘cultural contact zones’, instead representing an intentional differentiation between ‘cultures’ and viewing the same archaeological culture from two different perspectives and their affiliated political intentions (red: ‘late Germanic’, bright: ‘early Slavic’, dot: ‘settlement’, triangle: ‘graves’).

Intellectual Network Analysis

The analysis of intellectual networks in the arts and humanities is mostly undertaken strictly hermeneutically, but could benefit greatly by GIS and network analysis adaptation (Charle 2004). Network analyses can however also be visualized and analyzed as non-georeferential graphs without spatial relationships (see fig. 2). For this purpose, several freely available open source tools have been developed in the field of spatial humanities. Their usage is well-documented in numerous tutorials and explanatory applications. In the natural sciences, namely geoinformatics, methods and theories of data modelling and the evaluation of spatially-based network analyses applicable for social sciences were developed a few years ago. This includes data from random, imperfect, immeasurable sources: letters, travel reports, articles, books, and others (Malczewski 1999). The application of these potentially very exciting research approaches for the consideration of unclear and/or double meanings in narrative stories and descriptions (Saupe and Wiedermann 2015) has not, however, yet been successful.[15] In such studies, the complex processes of the interactive transfer of knowledge or opinions can be studied in depth. Within intellectual network analysis, the focus is often also on the exploration of how knowledge exists or is generated, or how research conclusions come into being. Intellectual network analyses can be carried out, for example, in the context of a discipline-specific discourse analysis in order to track links between researchers or publications cited, and thereby establish the strength of these links, as also investigate spatial links, epicenters of knowledge and communication pathways.

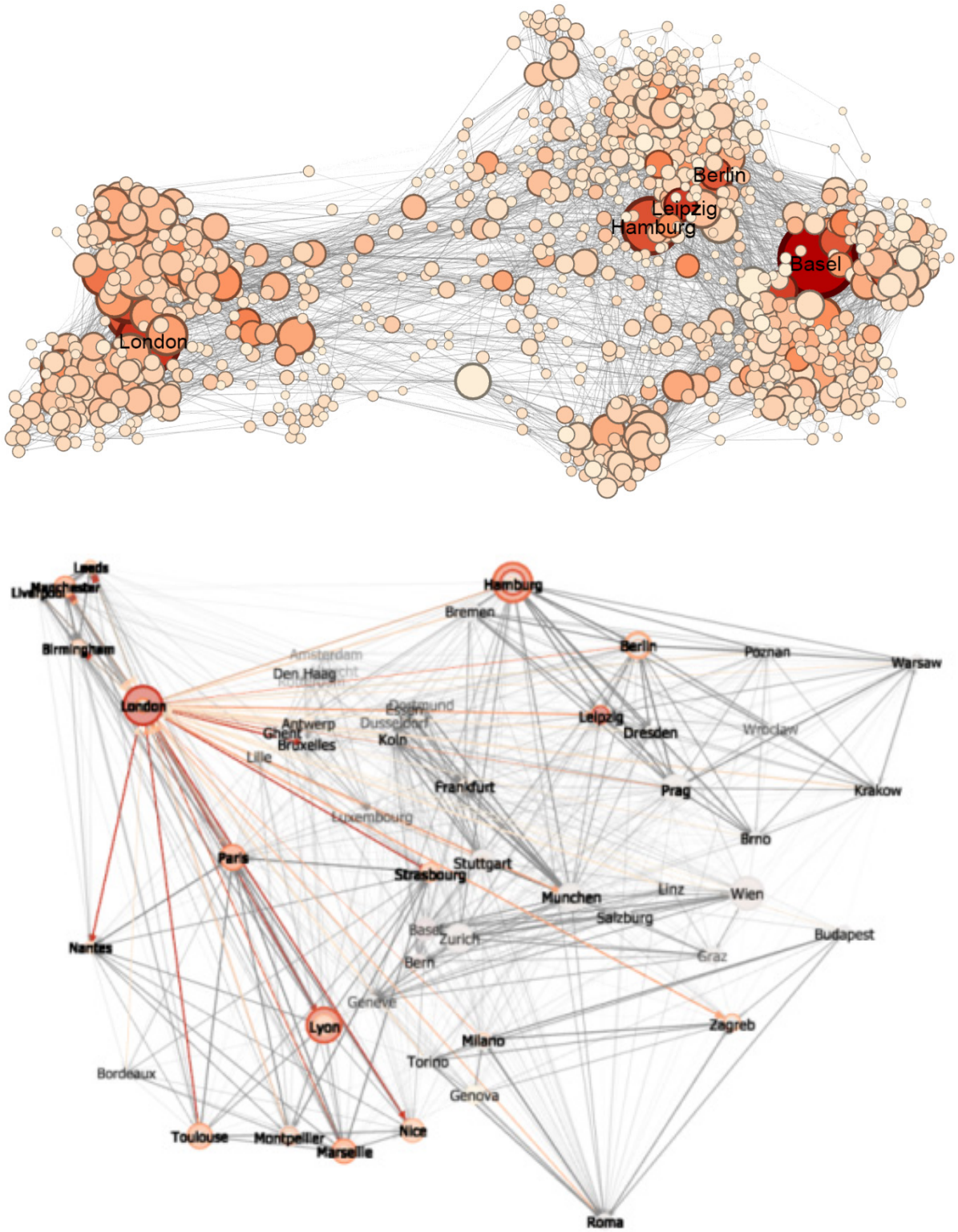

Figure 2: Two types of network connectivity diagrams: clustered and geographic referenced. Here, networks of research institutions involved in work on discourse analysis are displayed as examples. Both diagrams were created from the same dataset in an open source graphical database neo4j and analyzed in the software Gephi (see Grandjean 2014).[28] The diagram can be compiled without geographic reference in clustered data clouds, as is the case above. With weighting and associated differentiation by size and/or color, cities stand out according to research intensity. Above, each individual contact is calculated as point clouds in relation to one another in a similarity matrix by the algorithm selected (e.g. the Fruchterman-Reingold algorithm).

In Figure below, a corresponding georeferential algorithm calculates geographic location of the city in the network analysis diagram with reference to x and y coordinate values. Attention can also be drawn to research intensity here with the use of weighting and corresponding size and colour signatures. Unlike the above, the diagram below displays the data in geographically accurate positions in relation to one another. In the interactive visualization of both, the connections (edges) between cities (nodes in the graph-driven database) can be selectively highlighted by clicking on a city, as is depicted with London (below).

Imperfection of Spatial and Temporal Data in Social and Cultural Sources with regard to quantitative analyses and GIS mapping

In very few cases are studies in spatial humanities based on primarily collected geodata like (airborne) laser scan data. On the contrary, in the field of digital humanities, texts are much more frequently used as primary sources for mappable spatial and temporal information which can create certain challenging problems in terms of ambiguity. Spatial information, such as about the location of an archaeological site, can be viewed in a context of historical images like photographs, paintings or drawings which show the change over time. This must however be assessed for the veracity of somewhat stylistic information from fictional characters of a specific art or literary work (Piatti and Hurni 2011; Haug 2003). Moreover, deliberate forgeries of both locality and temporal context may be present in written sources—as has been concluded for many medieval deeds and referential documents. The well-known case of the Donation of Constantine is a good illustration of this point. The document was not created in Constantinople in 315 or 317 by Constantine the Great, as is purported, but rather in the mid-eighth to early ninth century Rome, a period characterized by several short papacies (Zeillinger 1988: 509ff). A critical view of sources and specifically of associated texts is therefore an extremely important prerequisite for the closest interpretation of literary spatial and temporal information.

Temporal information should also be considered conceptually, depending on which chronology will be depicted, the choice of which can be dependent on various approaches. The smallest possible unit of time, a year or decade, perhaps, might be selected for depiction on the map, but a broader span tied to an artefact or author could be chosen instead. For the former it is necessary for all mapped objects to share a certain contemporaneity for a period map focused on answering time-specific questions. For the latter, the map object (artefact, author, etc.) is the focus of interest and the comparison between mapped objects is rather more relevant than the temporal unit.

A complication of both approaches is that spatial and temporal information only rarely exists in comparable units in written sources. Elaborate data models which adequately compensate for the spatial and temporal inexactness of the textual data must therefore be created from the GIS's underlying data tables which contain the relevant data. Remaining with the example of medieval documents, this is exemplified by a document's dating and provenance. Many such sources can be precisely dated to within a year, and others at best only within a few decades or even a century. Place of origin is a similar case which, ideally, can be tied to an object which still exists today—such as a church or bridge. Often only the centre of an old village centre can be mapped when the name is provided, which inevitably leads to mapping imprecision on the micro scale. In addition, early medieval rural settlements

were not always true to location, but rather the clay and wood structures gradually decayed with use and new houses were erected some distance away. This practice resulted in so-called 'wandering settlements' and can be frequently evidenced from ethnoarchaeological sources (see, among others, Steuer 1988).

These uncertainties should be accounted for as closely as possible in the database model through the formation of categories so that, for example, year-specific temporal data for the 'medieval' category contains subcategories such as 'early medieval', 'century', 'decade' and 'year', all of which are elements of the category and so can be mapped from a corresponding database query. This cannot or can only partially be transferred synonymous with imprecise locality data as a unique hierarchical order in historical context with largely unknown spatial entities (boundaries of kingdoms, countries, holdings, terrae and districts), which are not or only partly recognized and therefore cannot serve as a category. Spatial imprecision is achieved in database modelling through the formation of categories in value ranges 'from' and 'to', with corresponding coordinate values which now can be mapped from a database query to the GIS. In the GIS, such spatial uncertainties can furthermore also be visually noted in the form of buffer zones which indicate the spectrum of possible localization areas. In geoinformatics, methods of fuzzy logic are also increasingly used. These can accommodate the ambiguity of place or time through statistical weighting, and so produce mappable and evaluable probability in GIS (Kainz 2002; cf. Burrough *et al*. 2015: 267–86). In spatial humanities, however, such complex database models and subsequent GIS analyses are still the exception rather than the rule; nevertheless, they show very clearly the high potential for further investigations.

Mapping Transculturality: Big Data and Smart Data[16] Analysis of Social Networks

Requirements of the intellectual network analyses include sufficiently large databases which, at minimum, comprise enough datasets for the creation of meaningful maps of spatial representations, and therefore provide the basis for statistically empirically verifiable studies. For the study of recent communication structures and their transcultural aspects, it is often possible to access and analyze quite large datasets from social networks with the aid of appropriate tools.[17] This is aptly referred to as 'big data' analytics (Reichert 2014). In digital humanities, the process of data collection is the base for analytical data mining, and this collection of evaluable data includes those gathered from scientific repositories in archives and libraries. For example, the metadata which describe the object (like books or their digitized material) contain standardized datasets: the so-called Name or Integrated Authority Files.[18] These are collected cooperatively by libraries according to international standards,[19] and serve primarily for literature and author research. They contain data including authors' dates of birth and death, names and pseudonyms, subjects, year and place of publications (with international usable coordinates), and co-authorships. Within the libraries' literature catalogues, other sources from archives, museums, other institutional projects, and web-based resources (blogs, portals, e-journals, etc.) are increasingly included as metadata on their holdings. These are present as digitally evaluable for various space- and time-oriented network analyses. The standardized metadata are increasingly internationally available as Linked Data Services of the Semantic Web in open access as research information infrastructure. The function of the Semantic Web (Web 3.0) is to provide discipline-specific

ontologies as new representations of knowledge with artificial intelligence. Unlike a taxonomy, which only displays a hierarchical breakdown of, for example, a relational database system, an ontology presents a network of information with logical relationships as concept maps.[20] Standardized ontologies therefore represent an advanced type of meaning development in large quantities of data and form a basis for new semantic issues entirely in keeping with transcultural studies on existing cultural barriers.

In addition to this secondary application for pre-existing large datasets, newly gathered data can of course also be studied in network analysis. This includes data more traditionally collected from interviews, literary research, etc. primarily obtained for the study. Such data are very specific to the research topic but are simultaneously only conditionally comparable to other data and exist mostly in smaller quantities. It is this latter characteristic which fundamentally distinguishes them from big data. While big datasets are not project-specific and unstructured, their great advantage lies in extensive availability and general international accessibility. However, based on smart data, large amounts of standardized data in comparable, consistent formats can be studied interchangeably and interoperable with numerous pre-existing open source analytical tools.[21] In this manner, big data and smart data analysis can represent a postulate for the specific exploration of global intellectual communication forms and networks for transcultural studies.

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Notes

[1] See Thaller (2012), and the journal, *Digital Scholarship in the Humanities,* which has established itself as the mouthpiece of international DH over the past two decades.
[2] For a critical reflection of transculturality with regard to cultural heritage, see Juneja and Falser (2013).
[3] For example, Linked Heritage. Coordination of standard and technologies for the enrichment of Europeana, Terminology, Best practice report 2013. Online. Available. http://www.linkedheritage.eu/index.php?en/216/terminology [june 30th 2017]
[4] For an introduction in scientific computing and cultural heritage see Bock *et al.* (2013).
[5] See, for example, the flagship project Europeana—not just with European focus but also including artefacts from all over the world in European museums. Online. Available. http://www.europeana.eu/portal/ [june 30th 2017]
[6] Such as the open source Quantum GIS. Online. Available. http://qgis.org/en/site/ [june 30th 2017]
[7] See, for example, statistical analysis and plotting of image properties, including statistics such as the standard deviation and mean with the R package ‘Cultural Analytics’. Online. Available http://r-forge.r-project.org/projects/rca/ [june 30th 2017]
[8] For a critical discussion on the meaning of historical maps, see Bodenhamer (2010) and Monmonier (1999).
[9] See Piatti (2012) and *Mapping the Lakes: a literary GIS*. Online. Availabe. http://www.lancaster.ac.uk/mappingthelakes/index.htm [june 30th 2017]
[10] Such as QGIS; for comparable usage of various open source GIS packages, see Volkmann *et al*. (2012) and Volkmann (2017).
[11] http://inspire.ec.europa.eu/ [june 30th 2017]
[12] However, only very heterogenous map data are available in the different regions which can complicate transregional research.
[13] For example, the paradata of a survey are data about the process by which the survey data were collected. Usually paradata are included in metadata.
[14] See the London Charter for computer-based visualization of cultural heritage. Online. Available. http://www.londoncharter.org/ [june 30th 2017]
[15] Recently there has been an increase in such network studies in archaeology. See Brughmans (2013); Knappett (2013); and Sindbæk (2007).
[16] Big data is the term for large complex datasets with storage and analyze processes. Smart data describe large well-structured datasets like scholarly digital editions in digital repositories produced in XML format and using the TEI guidelines. See Schöch (2013).
[17] See, for example, DIRT Digital Tools Collection. Online. Available. http://dirtdirectory.org/ [june 30th 2017]
[18] GND, German: Gemeinsame Normdatei, also known as: Universal Authority File, or respectively older Name Authority File PND, German: Personennamendatei. See the German National Library standards. Online. Available. http://www.dnb.de/EN/Standardisierung/GND/gnd_node.html and the international standard of the Virtual International Authority File VIAF. Online. Available. http://viaf.org/ [june 30th 2017]
[19] Based on the Library of Congress’ Bibliographic Framework Initiative (BIBFRAME) in MARC21/XML or RDF/XML formats. Online. Available. http://www.loc.gov/bibframe/docs/ [june 30th 2017]

[20] Mention should be made here in the area of digital cultural heritage mainly the ontology modeling of the Getty vocabularies Online. Available. http://www.getty.edu/research/tools/vocabularies/) after the CIDOC Conceptual Reference Model (CRM) with the 'Erlangen extension' CRM/OWL (Online. Available. http://erlangen-crm.org/ [june 30th 2017]) in the knowledge-ontology representation language 'Resource Description Framework (RDF)' or the Web Ontology Language (OWL) built upon it.

[21] See network analyzer Gephi (Online. Available. https://gephi.github.io/), and graph database system Neo4j (Online. Available. http://neo4j.com/ [june 30th 2017]).

Ksenija Bogetić / Vuk Batanović / Nikola Ljubešić

CORPUS COMPILATION FOR DIGITAL HUMANITIES IN LOWER–RESOURCED LANGUAGES: A PRACTICAL LOOK AT COMPILING THEMATIC DIGITAL MEDIA CORPORA IN SERBIAN, CROATIAN AND SLOVENIAN

Znanstveni radovi

UDK 811.163'42:070
811.163'322:070
Izvorni znanstveni članak
Prihvaćeno za tisak: 5. listopada 2022.
https://doi.org/10.22210/suvlin.2022.094.01

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Corpus compilation for digital humanities in lower–resourced languages: A practical look at compiling thematic digital media corpora in Serbian, Croatian and Slovenian*

The digital era has unlocked unprecedented possibilities of compiling corpora of social discourse, which has brought corpus linguistic methods into closer interaction with other methods of discourse analysis and the humanities. Even when not using any specific techniques of corpus linguistics, drawing on some sort of corpus is increasingly resorted to for empirically–grounded social–scientific analysis (sometimes dubbed 'corpus–assisted discourse analysis' or 'corpus–based critical discourse analysis', cf. Hardt–Mautner 1995; Baker 2016). In the post–Yugoslav space, recent corpus developments have brought table–turning advantages in many areas of discourse research, along with an ongoing proliferation of corpora and tools. Still, for linguists and discourse analysts who embark on collecting specialized corpora for their own research purposes, many questions persist – partly due to the fast–changing background of these issues, but also due to the fact that there is still a gap in the corpus method, and in guidelines for corpus compilation, when applied beyond the anglophone contexts.

In this paper we aim to discuss some possible solutions to these difficulties, by presenting one step–by–step account of a corpus building procedure specifically for Croatian, Serbian and Slovenian, through an example of compiling a thematic corpus from digital media sources (news articles and reader comments). Following an overview of corpus types, uses and advantages in social sciences and digital humanities, we present the corpus compilation possibilities in the South Slavic language contexts, including data scraping options, permissions and ethical issues, the factors that facilitate or complicate automated collection, and corpus annotation and processing possibilities. The study shows expanding possibilities for work with the given languages, but also some persistently grey areas where researchers need to make decisions based on research expectations. Overall, the paper aims to recapitulate our own corpus compilation experience in the wider context of South–Slavic corpus linguistics and corpus linguistic approaches in the humanities more generally.

* Acknowledgement: The research is funded by the Slovenian Research Agency (ARRS), as part of the research project "(Re–)imagining language, nation and collective identity in the 21st century: Language ideologies as new connections in post-Yugoslav digital mediascapes" (N6-0123).

1. Introduction

The growing interest in corpus building in social sciences and digital media studies can in part indeed be attributed to affordances of the internet, but has crucially been going hand in hand with the developments in corpus linguistic scholarship and social science perspectives more broadly. For a start, having become a prime empirical approach to language data, corpus linguistics has by now stepped beyond its long–lingering links to anglophone language science and lexicography. If we consider the linguistic scholarship of the post–Yugoslav space, it is no exaggeration to say that recent corpus developments have brought table–turning advantages; the ongoing proliferation of corpora and tools is creating invaluable sources for linguistic analysis and linguistic description across varieties, dialects, registers or levels of standardness.

In parallel, however, from the past decade onwards, a major turn concerning corpus linguistics, that is felt locally too, has been the awareness of the *assistive* potential of corpora in all forms of social research. In the post–Yugoslav area, we are seeing a range of studies starting to use corpus methods to explore important social issues that have locally lacked systematic empirical study (e.g. nationalism and news media in Serbia, Bajić 2018; discourses on sexually marginalised groups in Slovenia, Gorjanc and Fišer 2020; ideas of climate change in the UK and Croatia, Bašić et al. 2020). Even when not using any specific techniques of corpus linguistics, drawing on some sort of 'corpus' is increasingly resorted to for empirically grounded social–scientific analysis. In this perspective, the general growth of digitisation truly has unlocked unprecedented possibilities of corpus compilation. Perhaps most ubiquitously, digital media text archives, citizen journalism, and social networking sites now appear to offer a mine of data on social discourses and social movements, precious for the fast–developing field of digital humanities in particular. The Web may then indeed appear "a fabulous linguists' [or any social scientists'] playground", as corpus analysts saw it at the start of the century (Kilgarriff and Grefenstette 2003: 333).

Still, if one tries to apply these possibilities in practice, to compile their own corpus for their own analysis, the quotes may lose a lot of their appeal. Figuring out what one can use on this 'playground', whether one is allowed to enter it, or able to enter it at all, will require some not–so–obvious decisions, and can lead researchers both to unrealistic plans or discouragement at the outset. In available publications it will be hard to find the answers, partly due to the fast–changing background of these issues, but also due to the fact that most CL introductory guidebooks are oriented towards linguists, and rarely discuss initial compilation issues for thematic corpora as used by humanities scholars who are not necessarily (corpus) linguists at all. Moreover, a major proportion of existing research involves English language corpora, and there is a gap in the corpus method being applied to non–western and non–English contexts. The languages of former Yugoslavia are in this sense still

considered low–resourced languages, concerning the available tools and electronic resources, but also the available guidelines or examples of good practice. The availability of data and utility of analysis via corpus tools thus get clouded when one tries to envisage corpus compilation for particular languages and particular purposes.

In this paper we present a step–by–step account of a corpus building procedure specifically for Serbian, Croatian and Slovenian, through an example of compiling a thematic corpus, intended as a brief state–of–the art snapshot of options for any researcher weighing up their approach. The focus is on using a set of popular sources: online news texts, and citizen online comments, connected by one thematic frame (in our case that of 'language', but with the method applicable to any other theme). To set compilation against its background, we very briefly outline the corpus types, uses and advantages in social sciences and digital humanities (Section 2). Subsequently, we move on to discuss the corpus compilation possibilities and solutions adopted in our own work, including data scraping options i.e. methods of automatically collecting and extracting website data, permissions and ethical issues, and the factors that facilitate or complicate automated collection from these specific sources (Section 3). We then turn to corpus annotation and processing decisions, and present the use of tools found to easily and successfully deal with Serbian, Croatian and Slovenian data, in what we will show are budding, but to date unparalleled ongoing developments that promise easy preparation of data for various types of analyses (Section 4). Finally, we evaluate the available reference corpora, and present a state–of the art list of the resources and their advantages and disadvantages (Section 5). The discussion section recapitulates our own corpus compilation experience in the wider context of South–Slavic corpus linguistics and corpus linguistic approaches in the humanities more generally.

2. Using corpora in discourse analysis, social sciences and digital humanities: Types, uses, and the example corpus

The synergy of corpus linguistic and socially oriented inquiry, while in the post–Yugoslav area still considered a 'new' endeavor, is being vastly proven productive for overcoming the potential weaknesses of qualitative and quantitative approaches. For one, the field of discourse analysis has widely adopted corpus methods to study social discourses, social changes and ideologies, with a "firmer grip on the data" (Baker 2014: 3). The same advantage, in fact, holds for all humanities research; if the major 'scientific' criticism directed against qualitative social science is the possibility of cherry–picking evidence to suit researchers' intuitions or positions (Partington 2003), drawing on a representative corpus provides a safeguard against over–relying on one's own expectations. In turn, the socially oriented shift in using corpora addresses some criticisms of corpus linguistics itself, mainly with regard to inadequate treatment of social context.

Given these central uses and advantages, before turning to the corpus compilation process, we should briefly point to some distinctions in corpus types. What most linguists will have in mind when they speak of corpora are the large, *general corpora*, or *reference corpora*, composed to be representative of a particular language or language variety. On the other hand, it is the smaller, *specialised corpora* that will be compiled and used by analysts exploring social discourse – specialised corpora do not aim to be representative of an entire language, but usually cover specific domains or genres (Brezina and McEnery 2020). Their distinct advantage is that they allow a much closer link between the corpus and the contexts in which the texts in the corpus were produced (Baker 2014); the corpus compiler is often also the analyst, so knowledge of the context allows balancing quantitative and qualitative findings.

Specialized corpora have been applied to varied ends[1], in ways that have also reflected epistemic shifts in scholarship. At the outset, in (critical) discourse analysis, smaller representative corpora on particular samples of discourse have been combined with corpus tools, for example, to identify key concepts in a discourse, find associations between social actors, or conduct synchronic and diachronic comparisons. Perhaps the best–known examples are the pioneering studies on UK media representations of migrants and asylum seekers, which uncovered patterns in anxiety–inducing images of migration as natural disaster (Baker et al. 2008, Gabrielatos and Baker 2008); some similar metaphorical representations are identified in more recent Slovenian data, in corpus–assisted analysis of a specialised corpus of online news migration discourse (Fijavž and Fišer 2020). Arguably, over time, it is the digital humanities and (digital) media studies that have become the prime demanders for corpus grounding and specialised corpus building. Much of this effort has of course been directed toward practical language technology solutions, but a part of it has evolved theoretically in fusion with social science foci. This latter interest needs to be understood in light of the broader shift of interest towards the changing nature of public discourse and social participation propelled by digital technologies today – mainly, the shift towards including user–generated data, and the emic, bottom–up, citizen discourses and citizen media. As the public sphere is increasingly pluralised and fragmented, new modes of analysis become necessary. Corpora of 'unreal' media discourses, such as Tweets, citizen journalisms, or microblogging, are then bringing precious insights into how society is framed by not only those in power, but also those with less opportunity to get their voices heard.

What is common when considering any such specialised corpora is that an appropriate corpus will rarely be available as a ready usable resource, and will need to be compiled by the analyst(s) themselves with concrete demands in mind. Our own current and past projects have used different types of digital sources, like posts from a platform of online anti–feminist groups (The Manosphere, Author et al.

1 For more exhaustive accounts on the benefits of combining corpus–linguistic and various social–scientific methodologies see e.g. Baker (2020).

2021), blogs from a teenage dating portal (Mylol.net, Bogetić 2016), texts specifically on one topic (newspaper articles on proposals of gender–sensitive language in Serbia, Bogetić forthcoming) or containing specific content features (online hate speech, de Maiti et al. 2019). For the former, e.g. blogs of one portal, collecting a random balanced sample of data may be sufficient. For the latter, e.g. texts on one particular issue of interest, compilation will be somewhat more demanding, though we find it less discussed in existing guidebooks.

In this paper we focus on and present a case study of building what will be called *thematic corpora,* as one type of specialised corpora; still, many of the steps we describe will be similar to other corpora compiled for study in social sciences and digital humanities. Thematic corpora are built for the specific purpose of investigating the discourse on a particular theme or topic of interest to the researcher, such as migration in the above, or gender–sensitive language. They can be compiled from one source (e.g. newspaper articles on *X*), but also multiple sources (e.g. newspaper articles on *X*, digital media posts on *X,* spoken interviews on *X*). In other words, they are founded on two axes, where one is the theme, issue or event, and another is the choice of discourse type and genre. The latter will depend on the former, on the theme and how the analyst wishes to approach it. Their compilation itself raises some distinct issues compared to other types of specialised corpora, from identification of topic to scraping on different platforms. Still, as we will show, it leaves several acceptable options available, sufficient tools for the languages in question, and notable possibilities for further analysis. Their nature will be clearer when considered with an example.

2.1. Case study: The project and the corpus

The corpus used for illustration here was designed for a project entitled (*Re–) imagining language, nation and collective identity in the 21st century: Language ideologies in post–Yugoslav digital mediascapes*. The project explores conceptions of language and nation in Yugoslavia's successor states, spanning six states (in the present analysis only three: Slovenia, Croatia, Serbia) and the most recent period of five years (2015 through 2019). It also aims to address broader gaps in sociolinguistics and social science, where understanding ideas of nationhood in relation to language has been identified as a central gap, a kind of tacit knowledge rarely investigated in any empirical way (Kamusella 2019); in the (post–)Yugoslav context, the gap appears even more notable amidst little systematic investigation and often reductionist perspectives of language and conflict. Therefore, the empirical dimension and a corpus approach are central to the project ambitions in addressing existing gaps. The choice of data is also important for the goals, and hence for the corpus compilation sources: (a) media texts, i.e. online versions of newspapers/news portal articles, given the long established role of the media as the major producers of language ideologies (e.g. Milroy 2001) and (b) citizen commentary, in below–text comments sections, given the massive ongoing convergence of tradition-

al and user–generated media transforming public discourse as we know it (Lenihan 2018). Capturing the voices from the latter source of data, as yet less explored in this local context and elsewhere, is an important aspect of the project that again requires an empirical outlook and careful corpus compilation.

The corpus we need for this kind of exploration centres on one theme (that of language). The analysis can then nevertheless zoom in on specific aspects of interest, in this case language and nationhood in particular, but also any other linguistic or non–linguistic concepts that turn out to be salient in the discourse. Defining a set of major newspapers and collecting all texts that deal with a topic of (Serbian/Croatian/Slovenian) language, from any perspective, provides a representative sample in which to investigate the quantitative and qualitative patterns of meta–language discussion in the discourse selected for analysis (news media). The corpus needs to be compiled in such a way to allow quantifiable insights, searches, and basic analysis in standard concordances that use CL techniques (more on this in Section 3). In our case, we will primarily want to have insights into the stand–out concepts and groups of concepts, or into the statistical strength of connections between concepts such as those related to language and those related to the nation. Such insights are easily obtainable from once–compiled, comprehensive, representative corpora, to give us snapshots of the discourse on language from each country, to allow comparisons between countries, or comparisons between official media and citizens' discourses. Topic identification for the news texts is then a central step for the compilation of any thematic corpus of this kind, as the other types of data (comments, shares/comments) are subsequently obtained as URL–linked to these.

3. Corpus compilation: steps and decisions

3.1. Getting–in: Ethics, permissions, feasibility

Corpus work invariably yields questions relating to collecting and sharing texts, from ethics, through copyright matters, to the feasibility of collecting data at all. When embarking on our project with the three lower–resourced languages, however, the questions appeared even more acute given the scarcity of available guidelines or examples of good practice. Regardless of language, these matters are even more of a challenge when working with digital sources, the analysis of which is still a relatively young and changing sphere of work.

While digital media present unprecedented possibilities for sociolinguistic research and for corpus builders, by virtue of being public and free to access, arguably this need not mean they are public forums (Taylor and Pagliari 2018; D'Arcy and Young 2012). For one thing, the text authors, commenters and sharers will not be aware that their posts are used for scientific research. While some scholars have advocated trying to obtain permission in smaller fora or platforms (King 2009), this practice has generally been abandoned as both practically unfeasible in most cases (Jones 2015), and as compromising the aim of creating a representative corpus in

cases where only posts with permissions are retained (Milani 2017). One approach has been that for online social spaces local norms of access and visibility should be taken into account, the major issue being whether the information posted can be considered public or not (see Buchanan 2011; Zimmer 2010). To some extent it makes sense to acknowledge that in writings such as newspaper comments, or public tweets, users share thoughts with *any* strangers with *any* browsing purposes (Solberg 2010); this is different from, e.g. those sites that require extensive information upon registration, and assume a private, in–group audience (e.g. new mothers' forum, or a dating site; even though these are a continuum, see Buchanan 2011).

Overall, a 'pragmatic' (Anders 2018) and increasing approach in thinking about the ethics of internet–based research, that largely makes sense in the context of our project as well, means recognising the difficulties of conducting 'covert' research, while centrally respecting the anonymity of 'participants'. Starting from the premise that all comments analysed were posted in publicly available space, with the intention of having their views heard, it is anonymization that became our remaining and central concern for protecting the users' identities, rather than seeking permissions. With this in mind, all the pseudonyms were eliminated, as they were not needed for our study purposes; in the resulting examples in publications they can simply be changed in ways that resemble the pseudonym styles of the sites.

Aside from ethical issues, feasibility is a major consideration to evaluate at the very beginning. When it comes to newspaper articles, generally, we find that building corpora from South Slavic language sources tends to be less problematic, given the availability of newspapers' online archiving today (more on this in the following section); still, not all newspapers will archive all content online, and this needs to be checked in advance. Also, the practice is likely to vary from one country to the next – a preliminary evaluation of our further data collection from Montenegro shows several newspapers do not offer access to earlier articles online; for our currently discussed corpora from Serbia, Croatia and Slovenia, this did not pose an issue. The data scraping process can also be sped up when using available online news archives, e.g. ebart.rs, which store news from multiple newspapers and therefore eliminate the need to build separate scrapers for each news website. Nevertheless, at the time of writing most such archives tend not to be inclusive enough for researchers who wish to include, like we did, all the major newspapers from one country. Similarly to news articles, we found news article comments relatively easy to scrape, due to being archived on newspaper sites online. Finally, if one is to go further and collect e.g. social media data, as will be the case in the second part of our project, different limitations need to be considered, not only pertaining to ethics and copyright, but also to feasibility. For example, our initial intention to use Facebook data proved far more complicated, given that Facebook API allows practically no direct data collection any longer. Twitter is more accessible, and upon registering and obtaining

a developer account from the site (rather fast and uncomplicated), allows building own datasets.

Finally, to facilitate all these decisions and practical steps, from our experience we can strongly recommend what is becoming more common in discourse–oriented CL: joint work of humanities researcher/corpus linguist/programming expert, with the latter possibly assisting or advising throughout the process. A profile fitting all these areas is useful of course, though in reality increasingly rare. Some familiarity with the basics and possibilities of data collection and desired analysis is nevertheless often a prerequisite for such collaborations to indeed be fruitful.

In the rest of this section and in Section 4, our focus emerging from such collaboration will be twofold: (i) presenting the possibilities and our own choices in corpus compilation and annotation, and (ii) presenting details of computation and tool operation that may help with practical choices, and also be of use to those with more corpus technologies and programming knowledge.

3.2. Text collection and scraping

In order to construct news article corpora focused on the topic of language, we considered the following sources from Serbian, Croatian, and Slovenian media:

1. From Serbia: "Politika", "Večernje novosti" and "Danas" (major daily newspapers), "Blic", "Kurir" and "Alo!" (popular tabloids), as well as "B92" and "Srbija Danas", two well–known online media portals.
2. From Croatia: "Jutarnji list", "Večernji list", "Slobodna Dalmacija", "Novi list" (major daily newspapers), "24sata" (popular tabloid), as well as "Index.hr" and "Net.hr", two well–known online media portals.
3. From Slovenia: "Delo", "Dnevnik", "Večer" (major daily newspapers), "Slovenske novice", "Svet24" (popular tabloids), "24ur.com" online media portal.

A natural way of approaching the task of topic–focused data collection of this sort would be to access online archives of the chosen media sources, download/scrape all the articles within the selected timeframe, and perform content filtering afterwards. However, we found such an approach to be impossible, since many media websites provide no publicly available archives, effectively prohibiting us from browsing the articles published on a certain date or within a certain time scope.

Nevertheless, older articles do remain accessible on all source websites, but they can usually be reached only via a website's search engine, which is in some cases internal to the website, and in others merely an interface for performing a website–localized Google Search. We therefore decided to construct our corpora by searching the source websites using several specific queries of interest, collecting the articles returned by the search engines, and subsequently filtering them. For the Serbian and Croatian sources we used all inflections of the noun "jezik" (language) and the adjective "jezički" (linguistic) as search queries. For the Slovenian sources we used the same words, translated to Slovenian (i.e. "jezik" and "jezični"),

but we also added the noun "Slovenščina" (Slovenian), which is often found in Slovenian texts on language[2].

The scraping procedure, i.e. the collection and extraction of data from the chosen websites, was implemented in Python using the BeautifulSoup[3] and scrapy[4] libraries. In addition to the textual content of news articles, we also collected article titles, publication dates, URLs, and article author names.

In parallel to the scraping of articles, visitor comments for each article were also collected. These comments were organized in a tree structure in order to preserve their positioning in the comment discourse. Many websites, however, do not provide the option of replying to a particular comment, transforming the comment organization into a simple list. In addition, on some websites, such as B92, the links between comments and comment replies are not explicit, but instead embedded into the comment texts in the form of a quotation template. Due to such issues, preserving the proper ordering of the collected comments can be a non–trivial aspect of data collection – and one that should definitely be taken into consideration when using the data for discourse analysis.

The use of the script (Cyrillic/Latin) was considered a matter of interest, especially for discourse analyses of language ideology, where script choices may both be telling in themselves, and, as our data showed, subject of explicit meta–linguistic commentary, or even deliberate and creative script play. Thus, we kept both the original texts as well as their transliterations into the Latin script.

Each comment was assigned a unique numeric ID describing its position in the comment tree of its respective article. Similarly, each article was assigned a standardized unique ID identifying the language of the article via its ISO code, its source website via a numeric value, and its ordinal value within the source website.

3.3. Text filtering

In the text collection phase, we accumulated all articles from the chosen source websites which were possibly related to the topic of language. However, only a subset of these articles were actually focused on language issues, while in others the search keywords we used appeared in different, non–linguistic contexts. For instance, the noun "jezik" in Serbian, Croatian and Slovenian is polysemous, similarly to the noun "tongue" in English – it can either refer to language or to the tongue as an organ. For this reason, it was necessary to filter out the topically irrelevant articles (and their respective visitor comments) from the dataset.

2 Of course, selecting the scope of queries is a complex methodological question in itself (e.g. including a wider set, such as *dialect* etc., may be productive in some cases; our test checks, however, showed that our narrowed choice was adequate for capturing relevant texts); other methodological questions, such as the discursive scope of texts, are also relevant to this research but remain outside the scope of the present paper.

3 http://pypi.org/project/beautifulsoup4/

4 http://scrapy.org/

Achieving this goal effectively required performing an automated separation of article texts into two classes – relevant and irrelevant, with regard to the topic of language. After initial experimentation and a literature review, we decided to tackle this task as one of semi–supervised classification, using iterative bootstrapping. In this setup, we hand–picked several example articles for both classes in all three languages, which we used to train three binary SVM (Support Vector Machines) classifiers, one per language. These classifiers used the bag–of–n–grams approach, in which each document is treated as an unordered set of individual words and sequences of two or three consecutive words within it. The remaining articles were then placed in test sets (one test set per language) and automatically classified using the SVMs. Test set articles for which SVM classification decisions were the most certain were manually examined to verify their class, and were then used to expand the training sets, being simultaneously removed from the test set. This process was repeated as long as we were able to find new relevant articles in each iteration. In practice, the bootstrapping usually stopped once the classifier could no longer find any test set articles for which the probability of belonging to the relevant class was over 50%.

The critical resource in this filtering process was the number of truly relevant articles, since the classification problem was highly imbalanced. In other words, the texts automatically collected in the previous stage contained far more irrelevant than relevant articles. For this reason, manual checks of classifier outputs, although time–consuming, were invaluable in securing high levels of precision. Without them, it is likely that many false positive articles would end up included in the relevant set.

To illustrate the scarcity of relevant articles and the difficulty in isolating them, our initial text collection produced a corpus of 34,573 articles in Serbian, while only 1,088 of them were retained after filtering (3.15%). Similarly, out of the 32,990 collected articles in Croatian, 738 were retained as relevant (2.24%). Finally, out of the 29,105 articles in Slovenian, 555 were retained in the filtered corpus (1.91%). Detailed, per–source statistics of this type for all three languages are presented in Table 1.

Language	Source	Collected articles	Relevant articles	Relevance percentage
Serbian	Politika	3,760	245	6.52%
	Blic	5,303	174	3.28%
	Kurir	5,365	80	1.49%
	Danas	1,982	130	6.56%

	Alo	2,019	43	2.13%
	Večernje Novosti	2,782	213	7.66%
	B92	2,854	118	4.13%
	Srbija Danas	10,508	85	0.81%
	Total	34,573	1088	3.15%
Croatian	24 sata	5,670	48	0.85%
	Jutarnji list	7,117	142	2.00%
	Večernji list	7,217	225	3.12%
	Slobodna Dalmacija	446	29	6.50%
	Novi list	3,121	87	2.79%
	Index.hr	7,163	140	1.95%
	Net.hr	2,256	67	2.97%
	Total	32,990	738	2.24%
Slovenian	Delo	8,528	192	2.25%
	Slovenske Novice	4,487	29	0.65%
	Dnevnik	4,808	114	2.37%
	Večer	6,706	179	2.67%
	Svet24	1,935	15	0.78%
	24ur	2,641	26	0.98%
	Total	29,105	555	1.91%

Table 1. Collected and relevant articles per source and country/language.

As seen from the table, the percentage of relevant articles is substantially higher in major traditional media, such as Politika or Slobodna Dalmacija. On the other hand, the relevance percentage is lower in media of a more tabloid/popular nature, particularly those in the form of web portals, such as Srbija Danas and 24ur.

3.4. Disseminating the corpora: Possibilities and legal limitations

After the evaluation of options and constraints for collecting the data, and the collection process, came the decision of whether and how we may want to share our data with other researchers. In our own work, we were guided by a general commitment to the growing efforts of open data sharing, and made the corpus available to other researchers online. Still, the decision to disseminate one's own specialized corpus requires considering the options and legal limitations.

Overall, two commonly confused ways of free corpus dissemination need to be distinguished, since they have implications for the legal and ethical questions. One includes the 'free access' corpora: corpora that offer access free of charge, whose content can be viewed by using an online concordancer, allowing access to segments of the data searched, but not texts in their entirety. Many of the globally most used corpora are today disseminated in the free access mode, including the congregation of english–corpora.org with the field's most deployed sources, such as the British National Corpus (BNC) or the Corpus of American English (COCA). The practice is increasingly common for other languages in Eastern/Central Europe as well (see e.g. Erjavec 2013 for Slovenian) and different corpus types, including the more specialised ones. The second mode of dissemination is one that allows the complete takeover of material, in the 'open access corpora': corpora that allow for a user to download them to their own computer, in their entirety, free of charge. For corpus linguists, and those interested in particular item frequencies or particular lexical items, free access via concordancers is often sufficient. For scholars in the humanities interested in broader discursive patterns[5], however, open access download and analysis of texts on one's own computer is often far more advantageous.

Our own corpus set was disseminated as open access under the Creative Commons – Attribution–NonCommercial–ShareAlike 4.0 International (CC BY–NC–SA 4.0) license, published on the CLARIN.SI repository (Bogetić and Batanović 2020), following evaluation and approval. Generally, this mode of dissemination can legally be more problematic, since it allows third parties to take entire collections of texts and potentially share them in ways that we as corpus builders no longer have control over. Still, from a practical angle, for those planning to compose and disseminate corpora of texts in similar ways, it should be noted that the undefined legal practice means this kind of dissemination is as yet acted upon. An important point to also bear in mind is that upon complaints, one can always remove the text or a set of texts from the corpus. In our case, with the corpus available open access online, none of this has proven problematic to date.

5 Or those requiring any further pre–processing, such as selection of relevant parts or metadata via means of machine learning, or manual selection or labeling.

4. Linguistic annotation of corpora: The processes and tools

To put the corpus to use, some linguistic processing is typically needed to make the corpus more searchable and easier and more informative to analyse. Given the type of data we discuss in this paper, the central task of linguistic processing is to (1) lemmatise the text given its rich inflectional morphology and (2) enrich the text with basic linguistic information, mostly part–of–speech and morphosyntactic description. Annotation is in our case important and complex, as we work with a group of Slavic languages of rich inflectional morphology, and also, as we work with user–generated data that does not follow the linguistic norm. Luckily, while annotation of such material was a very hard endeavour just several years ago due to lack of freely available tools, researchers working with texts in Serbian, Croatian or Slovenian today have at their disposal a range of tools to perform the tasks for them, designed not to demand great technical competence (cf. eg. Ljubešić et al. 2016), and being freely available under very permissive licences. The process does not require the user to be familiar with the underlying approaches that the tools are based on (though some familiarity with the functions is an advantage). Note, also, that a corpus can be stored in multiple formats, as was done in our case: so, a text can be viewed as just a plain, 'clean text' or it can also be viewed with the tags, providing access to the versions that best meet our needs at different steps of analysis.

This section will cover four main topics: (i) a very basic description of the logic of supervised machine learning, the driving force behind the technologies presented here, together with thus based taggers that we chose to use (ii) the various approaches to text annotation, together with our own choices and (iii) the limitations of the machine–learning–based automatic processing of language data each user should be aware of.

4.1. Machine–learning–based linguistic processing

Since the mid–1990s, the dominant paradigm in developing technologies for linguistic processing, also called language technologies, has been machine learning. This paradigm allows computers to solve language–related problems (machine translation, text normalization, part–of–speech tagging, etc.) by learning from examples, i.e., from data instances in which the task at hand has already been solved by humans. For lemmatization, such examples meant for learning would be sentences broken up into tokens (words and punctuation), with each token being mapped to the canonical, dictionary form of that token. For part–of–speech tagging, such data would be sentences with each token having a manually assigned part–of–speech tag. Such datasets are called "manually annotated" or "training" datasets, as they are used for training computer programs called language tools that automate the task initially performed manually by humans.

While machine–learning–based language technologies serve a great role – the automatic annotation of large quantities of text that would be absolutely infeasible

if done manually, they do have a series of limitations, the most prominent being that they cannot learn much beyond what they have seen data–wise during their training. While they have a generalization capability, and a similar sentence will be correctly annotated, if the text moves too far away from what examples the computer has seen during its training, performance will decrease drastically.

One older option for linguistic processing of our languages of interest is the freely available ReLDI tagger (Ljubešić et al. 2016). The tagger is known to have high success rates for working with all three of our languages of interest, and was found suitable in our own work. Limitations are nevertheless occasionally observed, and need to be borne in mind, depending on one's research purposes. As an example of a failure, we can use a sentence from our Croatian comments corpus, a sentence written in the Zagreb vernacular, where the Kajkavian variant of the interrogative pronoun "što", namely "kaj" is used. The example sentence "Kaj si ti konzumiralo, dijete?", results in a wrong part–of–speech tagging result, namely the following tags: "VERB AUX PRON VERB PUNCT NOUN PUNCT". While the remainder of the sentence is correctly tagged, the interrogative pronoun at the first position is tagged as a verb. This happened for a very simple reason – in the Croatian hr500k training dataset, whose aim is to be representative of standard Croatian language, the interrogative pronoun "kaj" occurs very infrequently, and not always in the role of a pronoun.

Despite usability and common use of the ReLDI tagger, our own choice was hence different, and involved the CLASSLA pipeline (Ljubešić and Dobrovoljc, 2019)6, as a newer tool version. We will briefly discuss its machine–learning based approach here, to help sketch the operation of the technologies in very basic terms and the advantages of the recently developed pipeline.

To help language technologies to deal better with language variation, and the limitations of training datasets, in the last decade there was a very important development in the area of machine learning, especially in the realm of language processing, called model pre–training. While we regularly train our models on the training datasets, that are of limited size, we have much more texts of various languages available, that are not manually annotated in any way. Given the distributional hypothesis "You shall know a word by the company it keeps" (Firth, 1957), the idea is to numerically represent the meaning of a specific word given all the contexts that word has occurred in inside a large collection of texts.

While there are different approaches to calculating the numerical representations of meaning of words nowadays, in the CLASSLA pipeline the concept of word embeddings is used, where each word is represented through 100 latent semantic numerical variables, i.e., numbers. The word embeddings for the Croatian language (Ljubešić, 2018) are learned from 1.7 billion words of texts harvested from the Croatian web and Croatian news portals. Inspecting the representation of the word "kaj" in comparison to representations of other words, one can observe that the

6 https://pypi.org/project/classla/

closest neighbours of that word are, inter alia, the standard interrogative pronoun "što", its Serbian variant "šta", their variants without diacritics "sto" and "sta", as well as the Čakavian variant of the interrogative pronoun, "ča". Given that the tool of our choice, the CLASSLA pipeline, has the described embeddings available, employing this tool to perform part–of–speech tagging of text written in Croatian, our example sentence "Kaj si ti konzumiralo, dijete?" is correctly part–of–speech tagged as "PRON AUX PRON VERB PUNCT NOUN PUNCT", regardless of the fact that it was trained on the hr500k dataset only, same as the ReLDI–tagger, which did not manage to deal with this level of linguistic variation. The main reason for the success of the CLASSLA tool is the fact that it uses the word embedding collection that was pre–trained on a collection of raw, non–annotated Croatian texts in which the word "kaj" occurred more than 250 thousand times.

4.2. Text annotation

The first type of annotation we needed for data analysis is lemmatization. Lemmatization deals with the inflectional morphological variation, e.g., mapping of the 3rd singular present verb form "radi" to its dictionary infinitive form "raditi". Lemmatization is especially relevant for highly inflected languages, such as the three languages that we are dealing with here, as it enables a much simpler lookup of specific lexemes, regardless of the morphological inflectional form they are in. Even more importantly, when analysing a discourse in terms of keywords and key concepts, as will be done as part of the present investigation on language–ideological themes in media texts, lemmatised data give much more accurate results (for example, individual words *radi* 'to work 3p sg', *radiš* '2p sg' may not reach statistical keyness, but the overarching lemma *raditi* 'to work' may do so).

The second annotation step involved part–of–speech tagging and morphosyntactic description. In our corpus work, we have used the part–of–speech tagset of the Universal Dependencies project (De Marneffe et al. 2021) and the MULTEXT–East morphosyntactic tagset (Erjavec, 2012). These are closely connected, the latter for the most part being only more detailed. For instance, the MULTEXT–East tagset has a category for abbreviations, while the Universal Dependencies tagset does not, requiring the word to be simply labeled with the part–of–speech of the expanded form. If our analysis was to focus, for instance, on abbreviations themselves, or on metalinguistic comments surrounding abbreviations, the MULTEXT–East tagset will allow fast identification of all such instances. On the other hand, the Universal Dependencies tagset may appear more simple for interpretation, and in some cases, more compatible with existing tools and concordancers. This also highlights a very important feature of any linguistic annotation process: each follows a specific formalism with its specificities, and the user should be very well acquainted with that formalism in advance.

In Table 2 we can observe the levels of token, lemma, part–of–speech information and morphosyntactic description. While the first column contains the tokens

of the sentence (“znači”, “su”), the second column consists of manually assigned lemmas (“značiti”, “biti”), the third one part–of–speech information (e.g. verb), with the last column containing the token’s manually assigned morphosyntactic description (e.g. main verb, present tense, third person, singular).

Token	Lemma	Part–of–speech	Morphosyntactic description
to	taj	DET	Pd–nsn
ne	ne	PART	Qz
znači	značiti	VERB	Vmr3s
da	da	SCONJ	Cs
su	biti	AUX	Var3p
posljednje	posljednji	ADJ	Agpfpny
tri	tri	NUM	Mlc
riječi	riječ	NOUN	Ncfpn
„	„	PUNCT	Z
nepravilne	nepravilan	ADJ	Agpfpny
“	“	PUNCT	Z

Table 2. An example of an annotated sentence from the Croatian corpus

Finally, for the kind of data used in our project it is important to decide how to approach the abundance of non–standard, computer mediated language. User–generated internet content such as online news comments that we collected is especially known to contain a great amount of noise and non–standard writing, such as abbreviations, erratic punctuation, misspellings, colloquial and dialectal expressions, sometimes jointly described as cyberorthography (King 2009).

There are two approaches to processing non–standard text; for work with Slavic languages, the decisions will depend both on the type of corpora and analyses planned, and the resources available for the particular language.

One possibility is to use non–standard text normalizers, i.e., tools that work to turn non–standard forms into their normalized variants, and once the whole text/dataset is normalized, to process the text as any standard text. An example of an instance of this type of normalization would be the mapping of the non–standard “kaj” variant of the interrogative pronoun into the standard “što” form. For this approach, training datasets consisting of non–standard texts and their normalizations are required. Another option is to skip this step of normalization, but to rely on annotation tools that can recognize and identify non–standard forms and tag them accurately. There have been increasing efforts in this direction for South Slavic languages, which involve adapting standard language tools to non–standard

language by training them also on examples of non–standard text (Ljubešić et al. 2017). This approach requires additional non–standard manually annotated training data. Research has shown (Zupan et al., 2019) that in cases where few resources are available for producing manually annotated training data, the normalization approach achieves better results, but that with reasonable resources for producing training data, better results are obtained with the approach of adapting the whole toolchain to non–standard language. This approach was used in the CLASSLA pipeline, where non–standard models are trained on a combination of standard and non–standard data. In other words, our choice in the end involved relying on the CLASSLA pipeline to adequately work with standard and non–standard data, and to skip normalization of the whole dataset. Initial assessment of results shows the approach to be quite productive.

Finally, of course, when designing a thematic corpus for discourse–analytical purposes, the degree of corpus annotation can vary greatly, depending on one's research goals, and on whether the corpus is intended for sharing as an open resource for future research. Considering one's goals, it is possible that analysts find less detailed annotation quite sufficient for their study purposes; based on our work, we would nevertheless recommend at least lemmatisation when working with online Slavic writing. Concerning corpus sharing, it may be beneficial to use as much annotation as possible to make the most of a corpus usability in future studies, though this will to a great extent depend on research costs, infrastructure availability and external, technical collaborators in the corpus compilation process.

4.3. The limitations of machine–learning–based linguistic processing

While the linguistic processing presented in this section has a great positive impact on the usefulness of a thematic or any other type of corpus, there are limitations. We have tried to put some of them forward already, and hope to suggest a systematisation of those below.

1. Automatic linguistic processing is based on models trained on the manually annotated training data. While significant resources are invested in producing these datasets, these annotations are still not perfect. Human annotators do make mistakes and there are always errors to be expected already in the data that we teach computers on. It is expected that some of these errors will be propagated to automatic annotations in large corpora.
2. The machine learning models are trained on a limited amount of data. There is capacity in those models for generalization (e.g., using the fact that adjectives are frequently followed by nouns etc.), but this generalization capacity does not fully parallel that of humans.
3. We do have an estimate of the amount of error that computers produce on unseen texts. For part–of–speech tagging and lemmatisation roughly 2% (1 in 50) of the tokens are wrongly annotated. The level of morphosyntac-

tic description carries a level of error of around 5%, meaning that 1 in 20 tokens will be erroneously annotated on that level.

4. The error in automatic annotation of texts in the most important layers is generally low, two to five percent; it should nevertheless be understood that the errors are not random, but are mostly present in phenomena that are either not well handled in the formalism applied, are badly annotated in the training data, or are infrequent in the training data. If the phenomena of interest to a researcher are those that are badly annotated, relying on such annotations could prove to be disastrous for one's research.
5. The training data is not only limited in size, but also in the representativeness of all the possible phenomena that can occur in language. While for standard language mostly newspaper data is used, and these do quite a good job at representing the language in general, one can easily assume that such data will not perform as well on very different genres, such as lyrical texts.
6. Each linguistic formalism is an approximation of the linguistic phenomena described. Not every user of every corpus will be satisfied with the solutions in specific formalisms, and some formalisms will not serve well specific research questions.

Overall, despite these limitations – which may be somewhat more notable for low–resourced languages, but are an unavoidable feature of machine–learning–based linguistic processing regardless of language – data annotation is becoming a more accurate and less demanding task, especially given the development of tools that help with it. In our case, the use of the CLASSLA pipeline was found useful and easy to apply; tools of this kind are useful even when one does not have in–depth knowledge of the machine–learning based processing and the mechanisms behind it. In this sense, a discourse analyst working with one's own corpus may resort to the use of CLASSLA, ReLDIAnno[7] (a web service using the ReLDI tagger) and similar tools, regardless of programming skills, though they should bear the above limitations in mind when planning their own research. Still, a collaboration with programming and corpus technologies experts is what we recommend as particularly beneficial when available.

5. Choosing a reference corpus

After all compilation questions are resolved, the corpora are ready for use. Still, using them in practice for discourse analytical purposes will likely require using them with a reference corpus – a large corpus of general language, which is used to compute patterns in the corpus of study, such as keywords.

7 http://clarin.si/services/web/query

Namely, if one is to use the basic CL analysis techniques, most notably the *keywords* function, this last step merits consideration. Keyword identification – a statistical approach to word frequencies to identify words occurring with unusual frequency in a given text, by comparing word frequencies in the compiled specialized corpus with those of a larger reference corpus – is a useful first step in most quantitative analysis of a social discourse. Keywords provide insights into central concepts in a discourse, showing the 'aboutness' of a material, and are subsequently analysable in different ways. It was important to the present project, and likely to be useful for other analysts, obtainable easily through standard software. Hence, finding an appropriate reference corpus to use is an important decision that will follow one's own corpus compilation, and not always easy for lower–resource languages. For the languages we worked in, there are currently fast ongoing developments in this direction, so we present a state–of–the–art list below (Table 3).

Corpus	**Link**	**Language**	**Sources / genre**	**Size**	**Annotation**	**Access**
GigaFida	https://viri.cjvt.si/gigafida/ http://hdl.handle.net/11356/1320	Slovenian	daily news, magazines, web texts, and different types of publications (fiction, schoolbooks, and non–fiction)	1.1 billion words	Morpho-syntactically annotated and lemmatised	freely available for search
Croatian web corpus hrWaC	http://hdl.handle.net/11356/1064 https://www.clarin.si/noske/run.cgi/corp_info?corpname=hrwac	Croatian	texts from the Croatian top–level web domain (.hr)	1.4 billion tokens	Morpho-syntactically annotated and lemmatised	freely available for download (CC–BY–SA) and search
Croatian language corpus Riznica	http://hdl.handle.net/11356/1180 https://www.clarin.si/noske/run.cgi/corp_info?corpname=riznica	Croatian	8% of fiction texts and 72% of specialized texts	102 million tokens	Morpho-syntactically annotated and lemmatised	freely available for download (CC–BY–SA) and search

Korpus savremenog srpskog jezika SrpKor2013	http://korpus.matf.bg.ac.rs/prezentacija/korpusi.html	Serbian	Literature, popular science, news	122 million words	Morphologically annotated (website notes the annotation as incomplete)	upon request at korpus@matf.bg.ac.rs
Lematizirani korpus savremenog srpskog jezika (SrpLemKor)	http://www.korpus.matf.bg.ac.rs/SrpLemKor/	Serbian	Literature, science, news, law	3,7 million words	Lemmatised and PoS Annotated	upon request under the terms of CC_BY–NC licence
Serbian web corpus srWaC	http://hdl.handle.net/11356/1063 https://www.clarin.si/noske/run.cgi/corp_info?corpname=srwac	Serbian	texts from the Serbian top–level web domain (.rs)	555 million tokens	Morpho-syntactically annotated and lemmatised	freely available for download (CC–BY–SA) and search

Table 3. An overview of reference corpora for Slovenian, Croatian, and Serbian

Corpus choice will of course depend on study aims, the size of one's own reference corpus, genre of data, etc. We are still evaluating the different corpora available for our own work, but must point out to possible difficulties, such as the time scope – reference corpora that are even just a decade older are bound to e.g. yield keywords that simply reflect new words or concepts, e.g. "covid", rather than discourse foci. Another option that has recently been suggested for lower–resourced languages is to compile one's own '–hoc reference corpus' (Kania, 2021) from the time frames and genres suitable for comparison. In this sense, lower–resourced languages are sometimes described as a "blessing in disguise" (ibid.) as they call for more careful consideration of limitations of reference corpora.

6. Discussion and conclusions

Language corpora have presented great opportunities for social science research beyond linguistics, and are attracting increasing interest in post–Yugoslav scholarship, both from perspectives of corpus building and corpus use. Still, corpus compilation and use includes a range of steps that are typically fuzzy to researchers of social discourse, especially given the absence of publications that deal with it explicitly in this language context. We have used our own project to systematise

these explicitly by bringing to spotlight the compilation of specialised corpora, specifically thematic corpora, which may be of greatest use in the humanities–disciplinary approaches.

Topic–focused data collection of media content can take different paths, which we have touched upon. Still, for the languages in question we found that, unfortunately, it is not possible to simply use online archives of selected media sources, as is the common practice in many other languages, given that the local media texts are not adequately congregated at any such archive. We have presented the alternative approach of querying search engines and subsequent filtering, which proved successful in our own research. Additionally, issues of ethics and copyright have nevertheless presented dilemmas, as a grey area in the South Slavic space (but also more broadly), requiring consideration of corpus dissemination. Our own approach is committed to open access sharing, which appears to be growing in Slavic corpus–building. We hope our corpora to be a contribution in this direction.

The step of corpus annotation and processing was found to be relatively straightforward for this kind of data, including the reader comments (sub)corpora that are more complex by virtue of non–standard language. There are increasingly available tools for this kind of task in South Slavic languages, though each will have limitations that are important to understand and that we have striven to point out. In this respect, collaboration of discourse analysts and corpus/programming experts is becoming more common; we found it to be very productive in our own work, and can recommend it when project capabilities allow.

Finally, this account merits a word of caution. We have tried to point out the limitations of corpus preparation and use that we have encountered in the course of our own project, such as limitations of machine–learning–based annotation, or limitations regarding suitable reference corpora). In addition, however, we find it is important for researchers in social sciences to be aware of limitations of corpus–based discourse analysis more broadly. For analysing social ideologies, identities and relations of power, as Motschenbacher (2018) points out, unreflected use of CL can have limited destabilising and de–essentialising potential. Grounding social analysis *primarily* in numbers can be misleading, both given the limitations of corpora and the complexities of the social discourse encapsulated in a corpus. In this respect, a careful synergy of an empirical, corpus driven approach with critical analysis in social context is key to avoiding little–revealing or even reductionist conclusions granted only by numerical patterns – and certainly a door to great possibilities of research where corpus use is indispensable, and hopefully to grow in the future of Slavic scholarship.

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Kompiliranje korpusa u digitalnim humanističkim znanostima u jezicima s ograničenim resursima: o praksi kompiliranja tematskih korpusa iz digitalnih medija za srpski, hrvatski i slovenski

Digitalno doba otvorilo je nove mogućnosti za sastavljanje korpusa društvenog diskursa, što je korpusnolingvističke metode približilo drugim metodama analize diskursa te humanističkim znanostima. Čak i kada se ne koriste nikakve specifične tehnike korpusne lingvistike, danas je za empirijski utemeljenu društveno–znanstvenu analizu sve učestalije korištenje neke vrste korpusa ('korpusno–asistirana analiza diskursa' ili 'kritička korpusna analiza', Hardt–Mautner 1995; Baker 2016). U postjugoslavenskom prostoru, nedavni razvoj korpusne lingvistike donio je prednosti u mnogim područjima istraživanja. Ipak, za lingviste i analitičare diskursa koji se upuštaju u prikupljanje specijaliziranih korpusa za vlastite istraživačke svrhe, i dalje ostaju otvorena mnoga pitanja – djelomično zbog pozadine korpusne lingvistike koja se brzo mijenja, ali i zbog činjenice da još uvijek postoji rascjep u poznavanju korpusnih metoda, kao i metodologije sastavljanja korpusa izvan anglofonskog konteksta. Ovim radom pokušavamo smanjiti spomenuti rascjep predstavljajući jedan postupni prikaz postupka izgradnje korpusa za hrvatski, srpski i slovenski, kroz primjer sastavljanja tematskog korpusa iz digitalnih medija (novinski članci i komentari čitatelja). Nakon pregleda tipova korpusa, korištenja i prednosti u društvenim znanostima i digitalnim humanističkim znanostima, predstavljamo mogućnosti sastavljanja korpusa u južnoslavenskim jezičnim kontekstima, uključujući opcije preuzimanja podataka s mreže, dozvola i etičkih pitanja, čimbenika koji olakšavaju ili otežavaju automatizirano prikupljanje i označavanje korpusa i mogućnosti obrade. Studija otkriva sve veće mogućnosti za rad s danim jezicima, ali i neka uporno siva područja u kojima istraživači trebaju donositi odluke na temelju istraživačkih očekivanja. Općenito, rad ima za cilj rekapitulirati vlastito iskustvo sastavljanja korpusa u širem kontekstu južnoslavenske korpusne lingvistike i korpusnih lingvističkih pristupa u humanističkim znanostima općenito.

Keywords: corpus linguistics, corpus compilation, corpora and discourse analysis, digital media
Ključne riječi: korpusna lingvistika, kompilacija korpusa, korpusi i analiza diskursa, digitalni mediji

NEVENA DAKOVIĆ

Digital Turn – Memory Studies Editorial

Digital Turn – Memory Studies Editorial

Nevena Daković

The invitation to be the guest editor of the special issue of the review extended by the dear colleagues and editors in chief – Prof. Veljko Milutinovic and Mr. Jakob Salom – is an honour and pleasure. But above all it is challenge how to best accommodate arts and media creative, liberal and humanistic topics within firm limits of Transactions on Internet Research. Although the obvious choice was the theme of Digital Humanities *en general* as the (un)defined domain where digital and humanities intersect, my recent interests channelled me toward "digital memory turn" understood as: (1) digital encounters with media, theatre, museums, history, edifices, literature within memory culture; and (2) the confluence of memory turn in humanities and digital turn in media studies. In other words, in order of grasping the magnitude of the effects related with the digital era, its media and culture it is necessary to demarcate the turn *per se* as well as part of Memory studies. On one side, the digital turn brings intense and rapidly growing digitisation of memories, their mediation and transmission through new media technologies. On the other side it makes us use digital *optique* in rethinking of ontology, philosophy, narrative structures, representational patterns, and other memory theoretical issues; it inspires the research of the ways in which digital as media, analytical tool and mode of display reshape the Memory studies in their third and fourth wave (Feindt, Krawatzek et al 2014); obliges us to analyse the digital reconceptualization of the notions of cultural memory, its agencies, artefacts, media, identity, archives and narratives. However, it cannot be helped noticing that, in spite of all, Digital Studies stands toward Memory Studies as "grand theory". The "substantive premises", methodology and grand doctrine frameworks flow from the Digital in Memory Studies "instantiating the processes already provided for in these abstract doctrines" [1]. Memory phenomena are just another chance for the mechanical application, verification and demonstration of the digital axioms. The opposite moment where the methodologies and theories pertinent to and coming from Memory Studies would overstep their boundaries and become widely accepted and used in Digital Studies is yet to come.

Memory and Memory Studies

The development and institutionalisation of the Memory Studies at the turn of the 1970s and are generously helped by the revival of the Holocaust Studies with its motto about "the duty to remember" and ongoing process of "the transformation of Holocaust history into cosmopolitan memory" [3]. Later diversified as Cultural Memory Studies, Trauma Studies, Memory in Popular Visual Culture, Memory Studies is broad interdisciplinary and transdisciplinary field which draws on an array of academic disciplines like psychology, sociology, history, anthropology, philosophy, or literary studies, decisively going against the arbitrariness of the disciplinary boundaries It also mobilises other multi-perspective researches coming from cinema, media, performance, museum, archive, heritage studies or oral history, as well as "professional fields of practice from technology, the arts, and politics" [2]. Memory Studies is concerned with an array of tightly interwoven questions about the representations of the pasts, narratives, texts, discourses, images; about multiple notions of the memory – individual, public, collective, private, cultural, collective and collected (Halbwaschs 1925, 1950, 1952; Assman J. 2000, 2011; Assman A. 1992, 2006, 2012; Winter 2006), mediatized (Hoskins 2009, 2011, 2018; Erll 2008, 2009; Kantsteiner 2014, 2018, 2020, 2021), digitized (van Dijck 2007), traumatic (Alexander 2004, 2011; Felman and Laub 1992), crises (Venetto 2008), screen (Bergson 1911) – or about forgetting (Connerton 1989, 2009). The dynamics of the amnesiac effects of the process of renewal of memory (Hoskins 2008) introduces the reflection upon ethic, poetics, policy and philosophy of memory. Moreover, Memory Studies explores how does memory change through dialogue, transmission, mediatization, inter and transgenerational contacts (Hirsch 1997, 2012; Rothberg 2009). Memory ii very foundation of identity (Assmann J, 2011; Garde-Hansen 2011) – from collective to individual, from national to family or personal – as "memory, remembering and recording are the key to existence, becoming and belonging." [4] defines memory explains as „ the faculty that enables us to form an awareness

of selfhood (identity), both on the personal and on the collective level. Identity, in its turn, is related to "time" and the „synthesis of time" and identity is effectuated by memory [5]. Their joint work on cultural level as cultural identity in historical, mythical, cultural time shaped in cultural memory that is, accordingly, one of the key words in this issue. In return, the notion of culture also via memory connects with identity. Culture as the unifying structure is taken after the „theory of cultural semiotics developed by Jurij Lotman, as a function of its memory agencies (...) of its inherent media, institutions and practices of storing and transferring cultural knowledge "[6].

The aim of Memory Studies is also defined as bringing the past in the present and rethinking value and meaning of the times long gone by in the present and future moments; as making us understand and recognize how does the memory exist in present arguing the close "genetic" link with the ASCA – Amsterdam School of Cultural Analysis that explores "cultural memory in the present" and "seeks to understands the past as the part of the present, as what we have around us, and without which no culture would be able to exist" [7]. In the double manoeuvre, cultural analysis includes the analysis of visual and other media narratives figuring in the museums (narratives) as the repositories of the past made accessible and displayed in the present. Eventually the key terms —graphically presented as plethora of Pierce's *semiotic* triangles – theorized from various perspectives are networked notions of memory-media-archive-identity-narrative-culture – digital.

Media

The interrelation of media and memory – "the integration of media in the construction of memory" [8] – is dense and dynamic as diverse media records (written, cinematic, digital, screen, visual, audio) decide about what we remember and how we remember it. In return „Based on Ong's history of communications media, Hutton (…) links the changing modes of communication with different historical perspectives on memory: orality with the reiteration of living memory; manuscript literacy with the recovery of lost wisdom; print literacy with the reconstruction of a distinct past; and media literacy with the deconstruction of the forms with which past images are composed" [9]. The digital memory turn is, therefore, thus just another phase in the development of the mediated memory and mediatization of memory. The two notions imply different processes as: (1) mediated memory refers to the transmission of memory to people via different media, as well as displacement of memory narratives across different media platforms; (2) simple conversion from one media to another – text into image, analogous to digital, written to oral. But all aspects of media and memory union characterised by a high degree of media self-reflexivity and self consciousness help the development of media archaeology (Parikka 2012). Moreover, mediated memory and transmedia storytelling through their common and similar ways of repetition allow retelling – of the original witnessed or experienced segment of the past – to develop and change across different media platforms. "The emergence of new media and global digitalization has led to radical dispersion of forms. Negroponte (1996)) describes the process in a way that the emotions, relationships, memories, fantasies, desires are transformed into isomorphic flows ready to be disseminated through various media channels and platforms." [10] Furthermore, a digitext/hypertext/cybertext able to run simultaneously across various media channels becomes the very space of transformation of matter into various narratives.

The way across platform (re)shapes new memory (media) narratives that are the subject of the media ecology and new memory ecology. The media ecology focuses „ stands for "the study of media as environments" as well as for the "study the interaction between people and their communications technology' [11] ". The new memory ecology – term generated through analogy – uses the overall cultural environment "to illuminate the emergence of remembering and forgetting "[12]. Our main concerns laying in the intersection of media and memory ecology are: the role of digital media in memory processes, practices and theory; the impact of digital media and culture on memory, its narratives, texts, archives, exposure; multi-fold effects of digital and digitized practices in memory culture/cultural memory. |The digitization – as conversion from analogue to digital based upon tremendous increase of information, their high paced flow and instantaneous transfer – assures the overall easily accessible, direct and immersive experience of the past and memories of culture, arts, time-space, history. The fast-developing digital infrastructures of mediated memory (social networks, digital media platforms such as VOD, OTT, live streaming) at the same time allow remediation, preservation, archiving of the cultural and historical heritage. It goes without saying that the digital as mass and communication media enhance communication among individuals, institutions, and other actors of memory and heritage domain; creation of communicative and connective memory as well as of collective and collected memories. Equally important are the facts that the developed digital use make the

education about heritage and memory topics more participatory and appealing and that the development of digital competencies is prerequisite for contemporarily research practices.

The digital recordings in two-way move instantaneously rewrite present into past and the ongoing events into memory narratives. In addition, prompt accessibility and permanent availability for reproduction and reexperiencing of digital and digitized memories at any place and any moment turn the past into permanent present through swift broader displacement from *then-and-there* to *here*-and-*now*. Digital memory (hyper)texts – intrinsically multimodal texts – make the past omnipresent in our landscape. The oversaturation with mediated memories – "as the glut of media is also a glut of memory "– is aptly described in metaphor of „media ghosts' memory. And if this metaphor is too easy, too cheap, it is nonetheless fair reflection on what mediated memory has become. Pervasive, accessible, disposable, distributed, promiscuous" [13].

Archives of Identity and Identities of Archive

Digital media enable an innovative managing of memories; creation of new memory media formats; making of new collections; novel archival and curating practices. Inseparable from the overall digital memory turn are new storage and display practices of GLAM – galleries, libraries, archives, museum (Reimar, Matevz et al 2020) – embodied in new memory repositories and spaces of „exposure", such platforms, websites, you tube, virtual museums. The digital and virtual acceleration in this moment is intensified due to COVID 19 pandemic that halted all travel and left us with the possibility of either living in memories and oblivion or accepting the virtual visits to the glam both for pleasure and research.

Multi-facetted digital reformatting of memory, in addition, changes the notion of narrative. The decline of post-war modernist narratives (van Alphen 2017) is followed by the replacement both of narrative– as the dominant symbolic form – and of archive – as the universal metaphor all conceivable forms of storage and memory (Ernst 2005) – by the database as the new paradigmatic cultural form (Manovich 2001). Thus, in the narrative-identity-archive triangle – linked with the triadic relation of memory-media-archive – both the narrative and the archive are replaced by database – and by 3-D computer-based virtual spaces "that we use to conceptualize lists and collections of whatever kind: collections of documents, of objects, of individual as well as collective memory "[14]. Subsequently, the model of memory is stratified in a way that „the archive does not tell stories leaving only to secondary narratives to „give meaningful coherence to its discontinuous "elements" [15]. Ernst's "archive", in this way, becomes apex of another semiotic triangle archive-narrative-identity, whereas identity rooted in the past is modelled in diverse media narratives and archives only to be returned to build the very memory from which it emerged. In opposition, at the other end from narrative identity (Ricoeur 1988, 1990) – with narrative understood as the medium of identity – is found the notion of archival identity (van Alphen 2017). It is the one imposed – and not like narrative one stemming from the life experience and lived through – created by and stored in archives. In return, archives or data bases „are no longer considered to be passive guardians of an inherited legacy but instead, they are seen now as active" [16] agencies of memory and identity building.

Digital memory turn

Following body of texts seeks to identify the key points of the (ex)change of memory and digital brought by ICT analytical insight into rewarding synergies of digital practices/media/tools and memory. The authors consider digital embodiments of memory such as digital memory texts and narratives; museums, archives, collections, and curatorial practices; media and art artefacts in digital context; various digital aspects of literary studies. In spite of the common thematic denominator the nine texts loosely fall into three groups: digital memory of GLAM widened to include AV heritage and festivals; digital applications for cultural heritage and digital perspective of literary studies. The research domain is marked by key words such as digital humanities, reading, internet, digital culture, memory, communication, remediation, archive, cultural heritage, digital heritage, representation – that appear in almost all contributions – or by terms as television, modernism, emotions, mobile application, tourism, academic work that appear sporadically.

The shared interest in the problematised heritage and contested memories of Socialist Federal Republic of Yugoslavia from its birth, through the height of its glory to its disintegration gives consistency to the first group of texts about digital GLAM. The contributions about the ups and downs of the (hi)story of former Yugoslavia – "infused with different meanings and affects" – in different media representations are offered in real history chronological order. Vera Mevorah speaks about "a semantic, or rather a theoretical change in analysing Holocaust memory practices – from re-presenting the Holocaust to communicating the Holocaust". Through analysis of testimonies of survivors, education practices, Jewish Churban or

art memory texts she proves digital as the new platform and framework that help innovative reflection about ethics, poetics and policy of Holocaust remembrance in the post-Holocaust era – when non-Holocaust events are never the less brought down to Holocaust (iconological, semiotic memory, legislative) patterns (Alexander 2011). The next text "Remediating Yugoslav Television Heritage: Croatian Radio-Television (HRT) and Radio Television of Serbia (RTS)" co-authored by Aleksandra Milovanovic and Ksenija Bozovic-Markovc continues the theme of WW2 in remediated/digitised TV texts. Unlike majority of titles that narrate the glory of the revolution, partisans and brotherhood and unity forged in the time, two popular TV series *Kuda idu divlje svinje* (*Where the Wild Boars Go, 1971)* i *Velo misto* (*The Big City*, 1980) deal with the other side of war, smugglers, black market or the everyday life of the seaside village dramatically changed by the WW2. After the breakup of Yugoslavia both series became important texts for the (re)construction of the national identities of the new nation states and the emerging historical revisionism. As important part of AV heritage they are remediated "from the analogue television programs into digital archives", and in new cultural heritage format "work as narrative of on-demand memory, history, knowledge" facilitating the access to the collective memories of the socialist past. Musealisation and archivization of the memories of NAM – nowadays the theme of Mila Turajlic`s new film about Labudovic and of numerous research projects and exhibitions – are the topic of Sunnie Rucker Chang`s "Digitizing a Collective Personal Archive of the Non-Aligned Movement". Digitalisation as the way of the formalisation of the archive – embodying the relation between "knowledge and power" – has twofold effect. First is the enhancement of the knowledge production and the second is making of more "elastic" musealisation. Milena Dragicevic Sesic and Milena Stefanovic investigate the digital turn visible in the museum practices in Serbia during the pandemic innovated by the open, inclusive and participatory Internet culture. Beside ethics and aesthetics, they deal with the leadership position and initiatives of the curators in diverse institutions from traditional one like *Matica Srpska Gallery* to modest, local ones like *Šabac city museum* emphasising that in spite of their contrasted status all equally indulge in counter-public projects. Interstitial spot is occupied by the writing of Ognjen Obradovic and Masa Senicic about online Theatre (Meta-)festivals that elevate the digital experience from the "substitute of the theatre and theatre festivals" to the "mediated experience that raises the festivals to the status of the authentic event of meta kind". Promptly responding to the wide spread digital migration paper proves that online theatre festivals in general and FIST as the chosen case study are authentic cultural practice "which provides a whole new space for critical thinking and public debate."

Leaving behind the habitual cultural memory reduced to art and media, the collaborative work of Fakin Bajec, Pogacar and Strauss explore the implementation of digital solutions – applications, websites – to cultural heritage with culture taken as the totality of everyday life. The authors study the development and adaptation of bread making heritage "to contemporary techno-social needs and expectations, teaching methods, and presentation approaches." Bridging the gap that might appear between theoretical and empirical research in the end they add students' responses, reactions, and evaluations of the implementation and the educational value of the heritage applications. Boris Petrovic`s in a way unique text describes the digital application – found on https://apps.apple.com/us/app/notre-dame-fiat-lux/id1492870439 iOS version; https://play.google.com/store/apps/details?id=com.parisinperson&gl=FR Android version – *Fiat Lux Notre Dame de Paris*, made for the famous cathedral. The application is conceived as elaborate mobile multimedia guide for the historical monument and religious site, but after the great fire it inadvertently became the digital memory guide for *lieux de memoire* or something that ceased to exist materially as such. Digitally represented history and memory narrative „communicates, presents and interprets the cathedral Notre Dame de Paris" in a multi-perspective and all-inclusive time space mode. Each chapter of audio guide part is accompanied by the illustrations – the independent works of art – that serve as another, complementary way of experiencing the tour of Notre Dame of the past, present and probably future.

The last two contributions sketch the polarized involvements of digital with literary studies. Incidentally as the authors are from Chinese Universities along the way they speak about theoretical, academic and educational imperialism. The uncritical assimilation and application of the big theories of the North Atlantic Cultural Space on local case studies or the absolute dominance of western theories in the non-western educational practices provide pro and cons of digital globalization or digital as globalization. Going from general to particular in her text "Reading and Its Spheres: From Modernism to the Digital Age", Dandan Zhang offers an insight into "reading and its spheres" in the time span from modernism to digital era. Her claim about digital application in humanities that have invigorated the studies of modernist literature, rests upon Virginia Wolf and her

American and British contemporaries and fellow writers. Discarding the search in methodology she turns to content analysis proving the closeness of "modernist writers' ideal of knowledge and information sharing with the open, inclusive Internet culture." Yili Tang ("The Ethics of Forgetting in the Digital Age: Memory in Liu Cixin's 'The Weight of Memories'") continues with the content analysis of Liu Cixin short story „a humanistic tale dealing with the future of human memory". Analogous reading of the topic of digital future - the conversation with the unborn child stresses - ends up with the belief that "The ethics of forgetting lies in the awareness that by affecting human capabilities, technology will re-engineer humanity".

The presented texts written by authors from four countries on three continents present just few from the array of the themes of digital memory turn – impact of digital culture, media and ICT and on memory and Memory Studies. Digital memory "texts have become more democratic i.e, easily accessed and approached by millions of people across the globe coming from variety of backgrounds, allowing the recognition of Internet as the encapsulated essence of the mass-media" [17], memory and their cultures. The chosen themes belong to large spatio-temporal area spanning from China to America, from the Holocaust past to the future of the one who waits to be born. Interdisciplinary theoretical platform involves media archaeology, media ecology, memory ecology, museology, archival and curatorial practices, close reading, appropriated to the digital and growing into Digital humanities. However, all the contributions neatly stay on the humanity side of the latter; they follow the migration of content and texts into digital and its consequences, not even trying to tackle digital issue whether or how the memory triggers the changes of binary codes, algorithms in conjunction with hardware materialities and logistical programs. That is the new path to be pursued in following complementary issue of IPSI rethinking digital side of Digital Humanities.

ACKNOWLEDGMENT

The author acknowledges funding support from the Serbian Ministry of Education, science and technological development.

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DIGITAL LABOUR IN CHINESE INTERNET INDUSTRIES

tripleC 12(2): 668-693, 2014
http://www.triple-c.at

Digital Labour in Chinese Internet Industries

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Abstract: Digital labour has been the subject of considerable research in recent years (Van Dijck 2009, Manzerolle 2010, Dyer-Witheford 2010). But relatively little research has considered professional workers in digital media. This research addresses this gap by focusing on professional workers in the Chinese Internet industries. This paper asks: How are these digital labourers involved in the digital media production? To what extent should we criticise this involvement?

Based on detailed empirical research in China, I argue that the rapid growth of the Internet industries depends on exploiting these Internet workers, such as the workers in Chinese Internet industries—the new 'sweatshop' of the digital era. Chinese Internet workers have been subsumed in the global capitalist system as the new 'sweatshop workers'.

This paper shows that Chinese Internet workers suffer very poor working conditions, and argues that these working conditions are the result of exploitation, a concept explored via using Eric Olin Wright's schema. This paper also argues that most of the Chinese Internet workers are in the lower middle-class class position, in which they are exploited by the upper classes. Their working conditions have seriously deteriorated and they are victims of inequality and injustice—although they also are able to exercise agency and resistance. This paper therefore calls urgent attention to the working conditions of these digital labourers.

Keywords: Quality of Working Life, Exploitation, Chinese Internet Workers, Working Conditions, Digital Labour

Acknowledgement: I express sincere thanks to my PhD supervisors, Prof. David Hesmondhalgh and Dr. Helen Kennedy, for their continuous encouragement, advice and critique, which have greatly contributed to the progress of this paper.

1. Introduction: The Existing Discussion of Digital Labour

Digital labour has been discussed from various perspectives in recent years. For example, some theorists regard Internet users as a form of digital labour and highlight productivity and creativity of these users (Barbrook 2005, Hills 2002, Jenkins 2008, Ornebring 2008 and Wang 2008). Terranova (2004) defines active users in the "digital economy" as "free labour", who build a community without great financial rewards and in return, obtain "the pleasures of communication and exchange" (91). The people who carry out "free work" are involved in work such as "building websites, modifying software packages, reading and participating in mailing lists and building virtual spaces" (74). Terranova regards these free labourers as a new productive force of capitalist production, as well as believing that capitalism is increasingly relying on free labour with its emergence.

Barbrook (2005) highlights the contribution of Internet users to the digital economy by analysing the paradoxical relationships between the new form of digital labour and capitalist production. He divides digital economy into three parts: The public element, the commercial sector, and the gift economy. To Barbrook, the gift economy is a free economy based on Internet users' free exchange of information—"anarcho-communist" (2) participation in his term. This gift economy is an alternative to existing capitalism, as it tends to build 'anarcho-communism' via mutual collaboration with the commercial sector: Free exchanges of information between users rely on the "capitalist production of computers, software and telecommunications" (5), and capitalist production depends on the "increasing numbers of people participating within the hi-tech gift economy" (5). In other words, Barbrook believes that the

gift economy, based on Internet users' activities, would develop via its collaboration with the commercial sector, and ultimately becomes an alternative to existing capitalism.

Terranova (2004) criticises Barbrook for his optimistic emphasis on the autonomy of the gift economy from capitalism. Nevertheless, Barbrook usefully criticises the commodification of hi-tech gifts and anticipates what people today called the "capitalism of communism", where the "communism of capital" (the elements that stem from information production that go beyond capitalism) are reversed and the economy of free gifts becomes a new capital accumulation strategy. As an alternative, Terranova (2004) emphasises the absorption of free labour into capitalist production. Both Terranova and Barbrook highlight the productivity of Internet users, via focusing on their online activities and participation, although they evaluate such activities in very different ways. Their discussions highlight dynamics between Internet users and capitalist production in the new media era. But these theorists do not conceive Internet work in the wider context of capitalist-labour production. They both fail to capture the ambivalent, complex, and dynamic relations amongst labour and capitalism, though the question of 'unpaid labour' is an important issue.

By contrast, some theorists pay attention to the question of professional labour in the digital era, by focusing on professional workers in new media industries, such as web designers and Internet workers (Kennedy 2012, Gill 2002). For example, Kennedy (2012) discusses ethics and values in web designers' working experiences via examining work practices and working conditions of web designers in the UK. She highlights that web designers, who are ethically motivated, make efforts to include web users with disabilities, in order to develop the accessible and perceived web for all people, especially people with disabilities. For instance, she argues that self-regulation in web designers' working experiences provides a different model from self-regulation in other cultural workers' experiences: Self-regulation in some cultural workers' experiences is problematic, because it results in individualisation; by contrast, self-regulation in web designers' experiences is ethically motivated, because it is driven by "a commitment to the founding ideals of the web as open, interoperable and accessible" (20).

Gill (2002) investigates poor working conditions in new media industries by highlighting certain issues, such as pervasive insecurity, low pay, and long working hours. She particularly links these poor working conditions to gender inequalities in new media work, by arguing that female workers in new media industries experience inequalities in terms of education, access to the work, autonomy, flexibility, and pay.

Both theorists' work suggests a need to focus on professional labourers in new media industries, such as examining how these digital labourers are working. Based on such "turn to labour" tendency in the research of digital labour, this paper pays particular attention to professional digital labourers in the Chinese context: Professional workers in the Chinese Internet industries.

According to Noon and Blyton (2002, 5), there are several criteria to classify people's work, such as the way jobs are undertaken, the main purpose of the work, job status, temporal pattern, and work location. I classify the Internet workers by the criterion of temporal pattern, such as full-time or part-time and permanent or temporary. Therefore, my PhD project classifies Chinese Internet workers into full-time workers, interns, and agency workers.

However, in this paper, Internet workers particularly refer to the full-time workers, who are paid regularly and hold formal positions in Internet companies. These workers are the main contributors to the creation of cultural products. Some of these workers possess high skill, while some have low skill, though none of them only sell manual labour as manual workers did during industrialist capitalism. Thus, some full-time workers here are understood as technical workers, conducting technical-related work, such as programming, web design and APP (Application Software) developing, etc. Other full-time workers are non-technical workers, who are mainly involved in administrative and routine work, such as HR (Human Resources) recruiting and training employees; marketing workers doing promotional work; and PR (Public Relations) personnel maintaining relationships with government officials, etc.

By clarifying who are these Internet workers, this paper asks: How are the Chinese Internet labourers involved in the digital media production? To what extent should we criticise this involvement?

The first step to answer these two questions is to examine how Chinese Internet industries have developed in recent years, and to what extent it links to the global economic system. Therefore, in section two, I discuss how Chinese ICT industry and Internet industries have developed in recent years, and how they contribute to Chinese economy. In section three, I explain the methodology of this research. Section four presents the empirical data I collected from fieldwork, in which I discuss certain issues that answer how Internet workers are involved in the digital media production, such as working hours, pay, lay-off, and pension problems. Sections five and six are the theoretical parts that answer to what extent we need to criticise such involvement. Section seven, the conclusion, I indicate a sort of worker agency as a hope in Chinese Internet industries. Below, I discuss the development of Chinese ICT industry, Internet industries, and Chinese economy.

2. A New Economic Growth Field: Chinese Internet Industries

2.1. The Chinese Economy

David Harvey (2005) defines neoliberalism as "a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade" (2). This concept had a strong impact to Chinese society in the 1980s with the introduction of market principles, which had close relationships with neoliberalism. Neoliberals appreciate the reform and opening up policy because they believe it emancipates the Chinese market and develops the Chinese economy. For example, Huang (2008) highly appreciates the move towards a more market-oriented economy in 1980s Chinese society, as it improved social welfare. Mok and Lo (2007) point out that, "the policy of decentralization and marketization being adopted to reform the social policy domain has significantly reduced the state provision and financing in social service and social provision" (2).

Admittedly, the Chinese economy has seen a rapid growth since the issuing of the reform and opening-up policy in 1978. Foreign investors have rushed into the Chinese market since China's accession to the WTO (World Trade Organisation) in 2001. However, social problems and tensions are generated from the ongoing economic reform: Inequality between the rich and poor, and injustice between the bureaucratic capitalists and workers have expanded. For example, Zhao (2003) discovers inequalities within the Chinese ICT industry by discussing different access to media between Chinese urban middle-class and rural peasants: "While the rising business and urban middle classes are increasingly using the media to articulate their interests and shape state policies toward their preferred ends, the rally cries of tens of thousands of Chinese workers and farmers in their struggles for economic and social justice, for example, have simply fallen on deaf ears in the Chinese media system" (63). Zhao states that the rising business and urban middle classes increasingly enjoy better quality of life, such as gaining more prestige, better education, and better health care; but workers and farmers, by contrast, are still struggling at the bottom of the social hierarchy. Moreover, Zhao (2007) explains the uneven regional development by quoting Hu, Zhou and Li's work (2001), which depicts China as "one country, four worlds" (102) because of the fragmentation and polarization of "class, region, gender, ethnicity and other cleavages" (101). Here, Zhao highlights inequalities between Chinese people due to the ongoing economic reform.

Some theorists explore the Chinese economy by highlighting the role played by the state. For example, Wang Hui (2003) states that neoliberalism is problematic in the context of China because it denies "the close relationship between the market and the political process" (100). He claims that the state plays a significant role in the Chinese economic system, since the political system in China is highly centralised. As Wang Jing (2008) suggests, the Chinese market is still controlled by the "party-state". Wang Hui (2003) then enriches the concept of neoliberalism with Chinese characteristics: It is "a combination of notions of market

extremism, neo-conservatism, and neo-authoritarianism" (81). Here, neoliberalism is understood to accelerate the process of delegating economic and political power from the central government to regional governments in a stable manner, to build an authority to guarantee the process of marketization, as well as to help the retreat of the state in the process of globalisation.

As a supplement, some scholars use the concept "crony capitalism" (Andres 2010) or "crony communism" (Dickson 2011) to understand the close relations between the Chinese state and the market. Andreas (2010) claims that contemporary Chinese society is the one labelled as a "state-led urban decade" (65). Dickson (2003) unpacks the reliance of a capitalist economy on close relationships between business and the state by the concept of crony communism. He argues that crony communism in China is different from other contexts, because the political hierarchy is dominated by all levels of officials, rather than a ruling family or central leader as in other East Asian countries, such as Burma. Consequently, the ruling officials are titled 'red capitalists', as many of them are involved in the economic system: "Many of the most wealthy entrepreneurs formerly held high-level party and government posts, and some are even the offspring of China's leaders; a far larger number of private entrepreneurs are former mid-level officials, or simply rank-and-file party members who did not hold formal posts but left their previous jobs to go into business […]" (Dickson 2003, 4–5). Meanwhile, Chinese crony communism is also distinctive because capitalists are subsumed into the group of officials: "[…] another group […] [that refers to] those who were co-opted into the party after demonstrating their entrepreneurial skills and business success' (Dickson 2003, 4-5).

Such discussion of the Chinese economy is helpful to grasp a sense of how the Chinese economy has developed in recent years, and is a useful way to understand the context in which Chinese Internet industries have developed. Below I introduce the recent development of Chinese Internet industries, and how they reflect certain characteristics and problems of Chinese economy.

2.2. The Chinese Internet Industries

In this study, the Internet market is divided into four parts: The hardware market (including companies producing computer hardware, such as Dell); the software market—including companies producing computer software, such as Oracle; the service market—including companies providing Internet services, such as Google; and the content market—including companies producing contents or converging contents provided by Internet users, such as Facebook. The Internet industries I focus on in this paper are part of the emerging content market, like Facebook and YouTube, as well as Chinese equivalents like Sina Weibo and Youku, which accumulate massive economic capital by providing online content.

The Chinese Internet content market has developed exponentially since the end of 2002, when the market was revived from the dot-com crash in 2001. At that time, some portals in the industries, such as Sina, Netease and Sohu began to make profits and to grow significantly. In 2003, the market was developed with the blooming of varied content services, such as search engines (Baidu), online gaming (SNDA), instant messaging (Tencent), and online commerce (Alibaba). According to a research report by the Boston Consulting Group, the Internet industry economy made up 5.5% of China's GDP in 2010 (The Boston Consulting Group 2012). In 2012, the annual market value had reached 385.04 billion RMB (£38.5 billion), an increase of 54.1% from 2011 (iResearch 2013). As a report from Xinhua News indicates, Internet-related consumption of information and services would be one of the biggest drivers of China's economic growth in the next ten years (iResearch 2013). The development of the Chinese Internet industries can be acknowledged from Figure 1, which indicates the fast economic accumulation of the Internet industries in one minute.

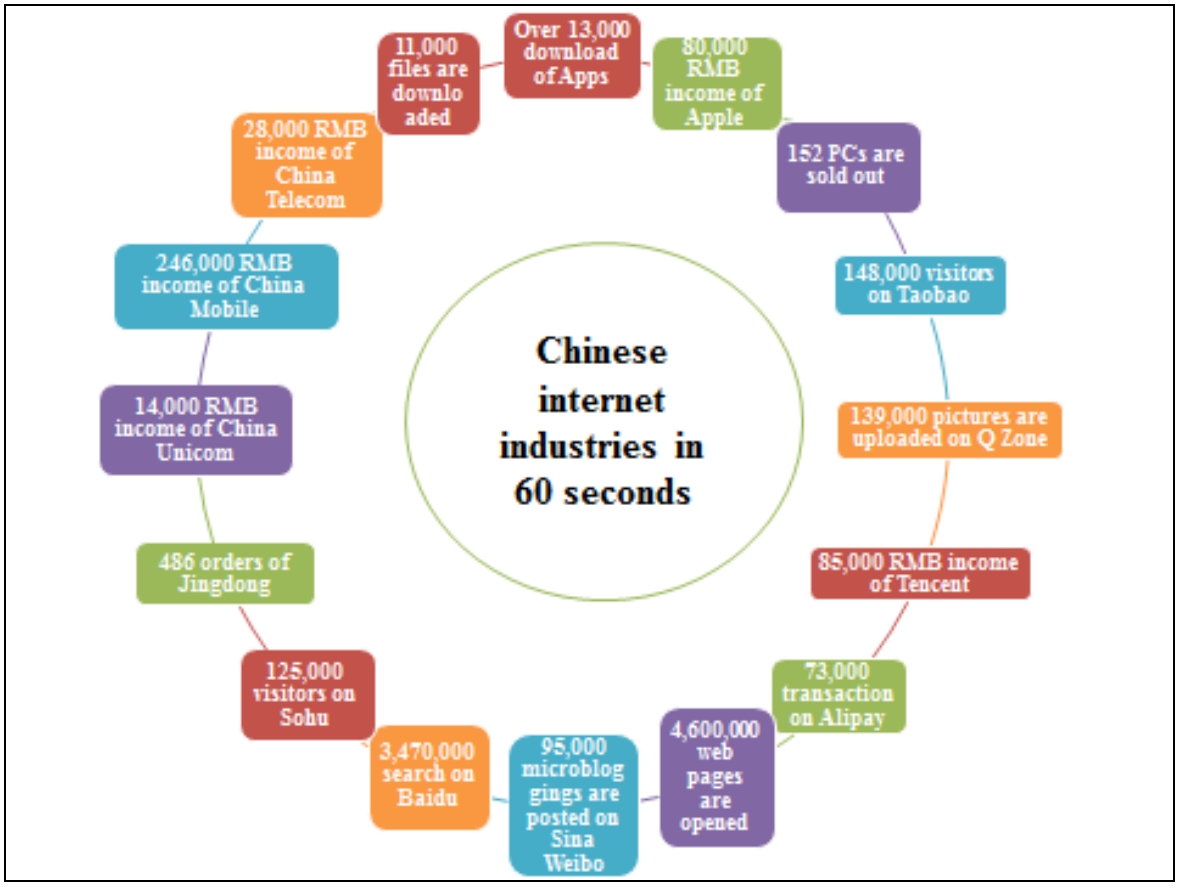

Figure 1: What happens in Chinese Internet industries in 60 seconds? (Translated from Sohu IT 2013)

This fast capital accumulation largely depends on the labour efforts of Internet workers, as huge numbers of workers are involved in the production process. The number of Chinese Internet workers had increased to 12.3 million by the end of 2009 (Liaoning Research Institute of Industry and Information Sciences 2013). Little academic attention has been paid to the class formation of these workers, such as their educational background, socioeconomic status, and social locations, nor to other dynamics and practices, such as their struggles in the industries and society. So how do Internet workers contribute to the fast growth of the Chinese Internet industries? What is their working life like in the industries? How class analysis can help understand Chinese Internet workers?

The Chinese Internet industries have been subsumed into the global value chain via not only its large number of Internet users (for example, Internet users in China had reached 590 million in the first half of 2013, which is more than the number of users in the whole of the Western Europe) (Xinhua News 2013), but also the close relationships between the Internet industries and the Chinese economy: The Chinese Internet industries have become an important economic growth field in contemporary Chinese economic system. As China has become one of the most important players in the global economic system, Chinese Internet industries also have been subsumed into the global economic system.

As I stated earlier, some theorists argue that Chinese economy develops in a different way than other social contexts, because of the close relationships between the market and the state. Likewise, Chinese Internet industries are also distinguished from ones in other geographical contexts because the state holds high authority and intervenes in the production process. For example, Ross (2005) recognises that Chinese government officials are still playing a strong role in the Chinese high-tech industries, even though the central government has not been planning the economy in detail since the 1980s.

Figure 2 shows a national conference, Constructing Healthy Network Cultures (*gongjian gongxiang wangluo wenhua*), organised by the Party, which all CEOs of the dominant Internet companies were required to attend. At this conference, the state intended to ask these Internet leaders to follow its plan for constructing the Internet industries. For example, as the first picture in Figure 2 points out, the state required Internet companies to work in conjunction with it to build a "healthy Internet space", where information security, such as the filtering of all information against the state, would be guaranteed. In this case, the Internet leaders were 're-educated' about the state's plan for constructing online freedom.

Figure 2: A conference in relation to Internet industries organised by CCP (From an interviewee's personal website on Campus)

According to iResearch, a leading company focusing on in-depth research on Chinese Internet industries, all the top 21 Internet companies in Chinese market are owned by individuals, who are widely known for pulling themselves up by their own bootstraps (iResearch 2013). These leaders were mostly not part of the bureaucratic capitalist class (I explain classes in section five) before their companies became the "large entities" in the industries. The state quickly made attempts to subsume leaders of the large entities by organising such "educational conferences", in which leaders were required to follow the state's rules and plans concerning the Internet industries, in order to realise its slogan "control the big, let go the small" (O'Conner and Gu 2012, 4).

It would seem that the Internet leaders are not keen to study the state's plan and rules about the Internet industries, as the final picture in Figure 2 indicates—some Internet leaders, such as the leader of Alibaba, the largest online commerce company that has Taobao as its constituent company, and the leader of Netease, one of the largest portals, fell asleep in the conference. But this does not mean that they reject being subsumed into the bureaucratic capitalist class. As an alternative, most times, these leaders choose to stand with the state, because their projected benefits are the same—both seek to maximise their economic benefits from the Internet industries. These benefits are mostly based on the labour efforts of Internet workers.

However, it is not only the relevant industrial policies, through which the central government intervenes in the industries, but also certain direct intervention in Internet workers' daily practices that influence the workers' experiences in the industries. For example, according to Leo, one of my interviewees who worked in the open platform department at Campus in 2010, officials from the State Administration of Radio, Film, and Television visit Campus every month in order to have regular meetings with workers in the Security Department. In these meetings, officials inform the workers about recent sensitive issues, which are usually related to politics and pornography, and ask the workers to delete references to these issues from all Campus' online products, such as forums.

Take the 1989 Tian'anmen Square Protests as an example: According to Alex, another interviewee who also worked in the Open Platform Department at Campus in 2010, at the end of April every year, the company starts to organise a number of meetings to prepare for the coming June 4, where a lot of Internet users usually organise various online activities for the anniversary of the protests. The company makes great efforts to stop these online activities, obeying the rules set by the state. Normally, there are two ways the company filters information relating to this sensitive issue: Filtering key words using censorship technologies and filtering pictures by manual examination.

The user-generated content department and the security department take charge of filtering key words, such as "explosion" and "bomb". The state provides a list of sensitive words as a guideline, which includes millions of words relating to the Tian'anmen Square Protests, and asks the company to delete them from its website. Alex's roommate, who worked in the security department, told him that such lists included 7,300 words relating to AV (Adult Video) actresses, not to mention numerous words relating to the Tian'anmen Square Protests, which remains one of the most sensitive political issues in contemporary China. Moreover, such prohibited words on the list include not only those written in Chinese, but also words from many other languages.

The manual examination of sensitive pictures requires efforts from a lot of workers. According to Alex, almost all workers, including full-time workers and interns, and even the boss of Campus, work day and night around 4th June, in order to filter pictures posted by Internet users and delete the sensitive ones. Normally, online pictures are examined after users have posted them, but, during this special period, these pictures need to be examined before being shown on the website. Thus, more workers are required to have excessive working hours in order to filter all the pictures. The workers, who usually work in relays, are required to work together at the same time around 4th June, in order to deal with the mountain of work. In other words, the workers are forced to have excessive working hours because of the state's requirements concerning sensitive issues.

Sometimes, the state directly stops workers' programs or products, because they may still include certain sensitive issues after the workers have filtered the information. For example, Leo said that the popular online game, Godfather, created by the department in 2010 and ranked as one of the top 10 most popular online games by users, was stopped by the Ministry of Culture, because it was perceived to contain sinister gang and gambling-related content. In this case, the workers' creativity was directly intervened with by the state, when they stopped the product because of sensitive issues.

Put simply, the state assigns the responsibility of filtering sensitive issues to Internet workers, by requiring them to delete sensitive words and pictures in relation to certain issues without giving standards. This increases workers' work intensity. When the state is unsatis-

fied with workers' practices or programs, it easily stops them. Such rough intervention from the state not only influences workers' practices and creativity, but also increases their work intensity, as the Tian'anmen Square Protests case indicated. Therefore, as an important part of Chinese economy, Chinese Internet industries reflect certain characteristics of the economic model, such as the close relationships between capitalists and the state; the industries also show some problems of the ongoing Chinese economic reform, such as the bad working conditions (excessive working hours without equal pay, which I discuss later) caused by the close relationships between the state and the market. Before I illustrate the working conditions, I explain the methodology I adopted in this research.

3. Methodology

I carried out empirical, at times ethnographic, research in two Chinese Internet companies, in order to study the workers in this paper. The first will be called Grand; this company focuses on online entertainment, such as online gaming and online fiction. The second one will be called Campus; this provides social networking services. I used observation and in-depth interviews as my primary methodology.

I conducted in-depth interviews in three periods in Campus: Seven interviews in February 2010; nine interviews in August 2011; and five interviews in December 2011. I also spent three months in Grand conducting participant observation, where I worked as an intern to observe and keep a journal about workers' daily practices. I also invited one worker at Campus, who will be called Galeno, who participated in the interviews in two periods in 2011, to conduct self-observation, by keeping a journal about his working life during the period of August to December 2011. And finally, due to his own habit of keeping work journals, he gave me his work journals from September 2009 to December 2011. I had hoped that more workers would agree to engage with this process, but in the event, they did not. Through these mixed, qualitative methods I explored how Internet workers get involved in the digital production of the Chinese Internet industries, which I discuss in the next section, and in the final section, I outline how I recognised a sort of worker agency as a hope in the industries.

My participant observation in Grand was covert for a number of reasons. Firstly, because Chinese companies tend to reject requests for access to do academic research, unless the research could bring them commercial benefits. Such rejection would certainly have been the case for my research into workers' practices. Secondly, this paper develops from my PhD project, which not only focuses on the quality of working life, but also emphasises acts of worker agency. By using a covert method, I felt that I would be able to witness more "genuine" acts of worker agency, which was an important part of my PhD project.

However, covert research necessarily brings with it ethical concerns. I felt that I was deceiving "participants" as I simultaneously built personal friendships and gathered their stories. Participants told me their personal stories because they saw me as a friend; friendship therefore helped me to gather data. This then presents me with a dilemma regarding sharing the stories that participants confided in me. This dilemma and feelings of deception remain, yet I choose to write about the research in this public domain, because I feel that it contributes to understanding Chinese society and the roles played by Internet workers in that society. Indeed, this is why I chose to pursue the research through what might be seen as an ethically problematic means. I hope that if my participants read this paper and recognize themselves in it, they understand my motivations for carrying out covert research and the benefits it may bring, and that they do not feel deceived by me.

4. Joy and Tears in the Internet Sweatshop

4.1. Working Hours and Wages

Most of my interviewees, technical workers in both companies, state that overtime work is a common phenomenon in the Internet industries. For example, Tim, a new technical worker who joined Grand at the same time as me, stated that he had worked overnight for several

days since he joined the department half a month ago. The following are some quotations from other workers who also experienced this issue.

> In Campus, the standard working time is 10am to 9pm […] This [long working hours] is quite common in the industries nowadays, where 10 hours are the average working hours […] I have a friend working in another Internet company, where he usually finishes his work at 11pm or 12am… As far as I know, workers in the 3G department now are still staying in a hotel to work day and night for a new program […] (Louis, former technical worker in the Open Platform Department at Campus, 28th August 2011, interview).

Non-technical workers, who deal with administrative-related work, in both companies, also share this overtime experience. For example, Katy, a new HR worker, who joined Grand at the same time as me, worked overtime for nine days, which usually meant she finished work at 11pm or 12pm, during the first ten days she joined the company. She said that sometimes she even considered sleeping over in the office, because her home was far away from the company. If she was "lucky" to finish work at 11:30pm, she could claim reimbursement for the taxi fee, would arrive home after midnight, and go to sleep by 1am. But she would need to get up at 5am, as she needed to change three times on the underground to arrive at the office. Thus, the overtime seriously reduced her sleeping time and made her very tired.

There are several reasons for Internet workers to choose overtime work, such as rewards they receive from the work—to satisfy themselves when having certain achievements in the work. But one of the important issues that forces Internet workers to work overtime is the high competition given by managers.

Ross (2005) points out that workers in the Chinese outsourcing high-tech industries work overtime because of high competition in the industries: They need to work harder to help avoid the risk of other workers taking their places. Some of my participants show the anxiety caused by high levels of competition.

> My leader always reminds me to keep myself in a high competitive status. For example, to think about who will be fired if the company needs to lay off staff, if I were the person, it means I need to work more. (Galeno, technical worker in the Product Administration Department at Campus, 24th August 2011, interview).

Managers and companies play a key role in pushing these workers to work overtime, because they seek high profits with low labour costs. For example, Galeno shows how his manager keeps him in a sense of crisis: He may be laid off if he does not work hard. It is also common to promote "geek culture" in all Internet companies, which encourages workers, especially technical workers, to show their love of the Internet work via working day and night.

Such long working hours causes a striking issue in terms of Internet workers' well-being in recent years: *Karoshi*, a Japanese term meaning death from overtime work. There were some cases in the Internet industries during the five months that I spent there, where some workers died from exhaustion, which was usually in relation to overtime and high pressure. For example, one of these examples was in Tencent, one of the main portals in China with the famous instant messenger system QQ, where an online editor died because of overtime work. The news was circulated on microblog sites because the editor talked about his overtime situation on his microblog (Sina News 2010). Some of his posts showed that he even worked until 8am in the morning.

Another *karoshi* case was in Baidu, the main search engine company in mainland China, where a member of staff in the online game department died from overwork on 14th November 2011 (Tencent Technology 2011). According to this news, the average age of death from overtime in the Internet industries is just under 38 (Tencent Technology 2011). Sam, the senior manager in HR department in Grand, says that it is not unusual to find cases of *karoshi* in the Internet industries. According to him, there were some cases of *karoshi* in Grand before I joined, but the PR department covered them up.

All these stories show the serious overtime situation in the industries. The most significant issue here is whether the overtime is reasonably rewarded. According to my participants, indeed, little of this overtime work is rewarded. In Campus and Grand, full-time workers' overtime work during weekdays is not paid. Instead, workers working late during weekdays can benefit from a free dinner or the money to buy a dinner, which is usually offered with certain restrictions. For example, in Campus, workers can only benefit from a free dinner after working for 12 hours. In Grand, workers only receive £1.80 for a dinner when they work after 8:30pm, and can be reimbursed for taxi fees after 11:30pm. Working during weekends is paid at double time, but in both companies, weekend overtime work needs to be approved by department leaders, who usually encourage workers to finish their work during weekdays. In other words, full-time workers are forced to work overtime without reasonable rewards. Put the unrewarded overtime work aside, it is important to ask how much Internet workers earn for their hard work. In both companies, technical workers are paid £13,000 per year, and non-technical workers receive £4,500 per year, compared to SOE (State-Owned Enterprise) workers' yearly salary of over £10,000. SOE workers also receive various bonuses from the state and some of their living costs are covered by the state. For example, according to my interviewees, workers in a state-owned flight company only need to pay £0.1 per day for their meals, which are good quality (most food is organic). In comparison, Internet workers, as workers in private enterprises, live only with this fixed salary, without extra bonuses and cheap meals.

> My salary is £13,000 per year before tax [£1,000 per month x 13 months] with the endless overtime, while my friend who works in a SOE, earns around £20,000 per year after tax [£800 per month x 16 months, and a bonus of £200 per quarter x 4 quarters] without any overtime (William, technical worker in the 3G Department at Campus, 19th December 2011, interview).

According to William, SOE workers are paid much higher than Internet workers, even technical Internet workers with high skills. The difference might be assumed to relate to their different work intensity, but the reality is that Internet workers are paid less, and have much higher work intensity. In contrast, SOE workers receive higher pay without working any overtime; neither do they have to devote themselves to their work during work time, as Internet workers do. In other words, Internet workers are paid unequally, compared to SOE workers.

This is what Wright (2010) points out in his research in Chinese society: SOE workers receive benefits from the party-state that "have been unavailable to other poor individuals" (3). Such inequality between SOE workers and Internet workers can also be found in their different benefits: SOE workers and executives in Internet companies enjoy specially delivered organic food as a benefit, whereas most Internet workers do not.

There is another issue relating to Internet workers' benefits: Sharing companies' stocks. Internet work has been fetishised in recent years because the workers are likely to receive companies' stocks as their bonus. For example, Xinhua News reported that the listing of Baidu—the dominant search engine company in China—in the USA NASDAQ stock market in 2005 enabled 400 workers in the company to become millionaires because they were given some stocks before the listing (Xinhua News 2005). It sounds as if every Internet worker is able to become a millionaire once he or she receives stocks. However, large numbers of Internet workers are struggling in difficult working conditions with the dream of being the next hero, but only a small number of individuals achieve the dream.

> I had some stocks before I left [Campus]. They were just 3,000 shares. It was £0.4 per share when I received them, which was evaluated as £1 per share when I left [Campus]. It seemed that I could receive £3,000 when I left. But, indeed, the company had a rule, which meant we could only sell a quarter of our shares every year. So this year I can only sell a quarter of my shares, which is £750. But because income from stock sharing is windfall in the income tax law, I need to pay 47% of this amount of money as tax, which means I only receive £397.50 after tax. This is even less than my monthly salary […]

> (Louis, former technical worker in the Open Platform Department at Campus, 28th August 2011, interview)

According to Louis, only some experienced workers who had joined Campus when it was founded could receive certain stocks. These stocks are not worth as much as workers in other industries imagine them to be and few of the more recently employed workers can receive stocks.

> Most of us were so disappointed when the company went public. All the managers celebrated it, but it's none of our business. We do not get any benefit from it […] Even to the workers who received stocks, such sharing does not guarantee them anything. It only becomes a way for the company to stop [workers] job-hopping: once you want to leave the company, HR would suggest you stay for one more year, in order to sell another a quarter of your shares. This does not only happen in our company, but also happens in other Internet companies. It [stock sharing] becomes a way for companies to bargain with us [workers] […] (Galeno, technical worker in the Product Administration Department at Campus, 20th December 2011, interview)

Here, it is evident that stock sharing does not authorise these workers any managerial power; instead, it becomes a way for the company to control workers. With such unequal pay, some Internet workers experience difficulty of housing in cities where they work. For example, most Internet workers are struggling to buy a house in the big cities with their low salary.

> I never think about settling down here, in Beijing, because it's too expensive to be here, especially buying a house […] Now I rent a house with my colleague, each of us pays £200 per month for a small and old room. It is still not cheap for us […] (Wynn, technical worker in the Open Platform Department at Campus, 24th August 2011, interview)

In these big cities, it seems that only SOE workers, civil servants, government officials and the rich can afford to buy a house. As Shelly, an intern in Grand, told me, civil servants in Shanghai are usually offered discounted houses by their work units (*danwei*), for which they only need to pay less than half of the market price, because these houses are built by their work units with free land provided by the local government. Here, the work unit again plays an important role in workers' benefits, as it did in Mao's era. But the difference is that the work unit in contemporary Chinese society only protects and guarantees certain classes benefits, such as the higher middle class—civil servants and SOE workers.

Admittedly, there are some jobs that pay more than others, which cannot be criticised as a result or form of exploitation. But, in this study, Internet workers receive low pay, in spite of their long working hours and high work intensity, because they are controlled by the higher classes, such as the capitalists in this study—Internet companies, via work contracts (Internet workers cannot escape these experiences of unrewarded overtime work, because it is so common in the Internet industries). This shows that Internet workers' labour efforts and skills are appropriated in the capitalist production process via long working hours without equal pay.

As I pointed out earlier, some technical workers receive certain stocks as part of their bonus, but such stock sharing does not guarantee them good pay, nor does it authorise the workers any managerial power. With such limited benefits, Internet workers still need to sell their skills to survive. In other words, Internet workers are forced to sell their labour efforts and skills in the Chinese capitalist market, which has been subsumed in the global value chain as the second largest economic system, with an unreasonable price. I argue that such unjust experience is caused by a sort of exploitation between classes: The bureaucratic capitalist class—the state and Internet companies in this study—dominates the lower-middle class and appropriates the labour of this class, because the former own means of production and the political power to allocate these resources. I explain the way I discuss classes in section five. This exploitation between classes results in an injustice in relation to Internet workers' pay and work time: Internet workers are not rewarded for their high work intensity,

and in contrast, government officials and capitalists appropriate this part of labour efforts. Therefore, the structural concept, exploitation, is the force behind Internet workers' unequal and unjust experiences in terms of work intensity and pay. I clarify the way I use this concept in the theoretical part—sections five and six.

4.2. Job-Hopping or Lay-Off?

Some theorists argue that job-hopping becomes a common phenomenon in Chinese high-tech industries (the hardware market). For example, Ross (2005) points out that the average turnover rate in the Chinese high-tech industries is about 20%, which is quite high in his understanding. This high turnover rate was reflected in my fieldwork: Six out of the seven interviewees, whom I contacted in 2010, had left Campus by the time I contacted them again in 2011.

As some of my interviewees say, two years is quite a long period to stay in the same company in the Internet industries.

> Most workers in my department, almost 20 people, left in just one and half years […] Every time we gathered for team building, I saw new faces […] (Galeno, technical worker in the Product Administration Department at Campus, 24th August 2011, interview)

This obviously indicates a high turnover rate in the Internet industries. Some theorists point out certain problems caused by this high turnover rate. For example, Ross (2007) points out that such frequent turnover, results in high costs for training, because workers usually leave after benefiting from training, and then new workers have to be trained to replace them. Ross (2007) also claims that job-hopping becomes a bargaining tool for experienced workers to negotiate with companies for good pay.

But, indeed, such bargaining experience only applies to certain experienced technical workers, who have the high skills to bargain with companies. In contrast, most workers change their jobs because they struggle to earn good money and want an easier working life.

> Now everything's getting expensive, I need to find another position with better pay, so that I can survive in this city […] But autonomy in work is the more important reason for me to job-hop […] (Walter, technical worker in the Advertisement Department at Campus, 25th August 2011, interview)

Here, Walter points out that good pay is an important reason for him to change jobs, though autonomy is another important reason for him to consider changing jobs. As in most countries, working and living in big cities is not easy. Some workers, most of whom are in middle class locations, choose the new lifestyle of a "weekly couple" (*zhoumo fuqi*) or "monthly couple" (*yuemo fuqi*), which refers to the family gathering that takes place once a week or once a month, because of the high living expenses in big cities. For example, Sam is a senior manager in Grand's Shanghai office, and his family are based in Najing, another city two hours away from Shanghai by train. The high cost of living in Shanghai stops his family from moving there with him, and the terrible traffic jams, means it takes Sam more than four hours to go back home, and stops him from gathering with his family every day. Then, the only choice for Sam is to be a "weekly couple" with his wife by going back home every weekend. This new lifestyle obviously influences workers' life quality, as it separates workers from their families. This goes against the traditional Chinese family life, which is based on living in groups. It is the high cost of living in big cities and their unequal pay that push workers to choose this modern lifestyle and decrease their quality of life.

Put simply, some experienced technical workers do benefit from the frequent job-hopping in the industries, because they have high skills to bargain with companies for good pay. In contrast, many workers choose to change their jobs because they suffer from bad pay and high living costs in big cities. These workers pursue a good job, with good pay and a convenient lifestyle, by frequently job-hopping. Moreover, there is another side to the coin: in some cases, companies lay off workers.

> I had a colleague, who had been at Campus for four years, but he still received the same salary as me, and I had just joined the company… It was one way the company forced us to leave […] Finally, he left as most new employees were paid higher than him… If I were my colleague, I would also choose to resign, as salary is a way to evaluate a person's talent and to show respect to that person […] It doesn't matter how much you are paid, but it matters how much more you are paid than others, especially people whom you think are less talented than you […] (Galeno, technical worker in the Product Administration Department at Campus, 24th August 2011, interview)

In this case, workers are forced to leave by the company in an indirect way, because the company needs "fresh blood" to bring creative ideas. Workers, indeed, are laid off in an indirect way.

Three months after I finished my internship in Grand, I contacted my friends there, and was surprised to find that more than half of the full-time workers in the HR department had been laid off, because the company wanted to cut its labour costs. According to the work contracts, these workers were informed of their redundancy one month before they left and were paid one more month's salary as compensation. These workers did not have the time to find new jobs in one month, but they had to accept the situation. In the Chinese context, work unions do not work well. The Chinese unions usually stand with companies, by persuading workers to accept unfair working conditions, rather than protecting workers.

In both examples, workers were laid off in an indirect or direct way, without any protection from the unions. The lay-off issue addresses an urgent problem in the Internet industries: Internet workers lack protection from the work unions, such as job security. Admittedly, some workers benefit from frequent job-hopping. But, more workers change their jobs because of the bad working conditions they experience. And some workers are even forced to leave without protection, because companies want to save labour costs or employ "fresh blood".

4.3. Life After Retirement

As I have discussed in the last two sections, Internet workers experience serious overtime work, unreasonable rewards for their hard work and unstable working status. But this is not the complete picture of their working life. They also experience insecurity in their working life, such as the insecurity of life after retirement.

Similar to some countries, in contemporary Chinese society, certain types of retired workers are protected by the pension system. For example, Internet workers are required to pay 8% of their salaries into a pension fund, to which the companies give an amount equal to 20% of workers' salaries. The workers will receive a certain amount of this money every year after retirement. Compared to the pension system in which Internet workers—employees in private enterprises—participate, SOE workers and civil servants benefit from another pension system, in which the work units pay into the pension fund, but they will be given more money than private enterprises' employees after retirement.

After the pension reform in China, workers now need to work longer and pay more into their pension funds than they have done before. Workers deposit part of their salaries in a pension fund, in order to guarantee their quality of life after retirement. However, in China, this amount of money is shrinking, due to the failure of investment in pension funds in recent years. It is reported that the growth rate of pension funds is much slower than the growth rate of the CPI (Consumer Price Index) (Chinese Economics 2013). In other words, the pension that workers will receive after retirement will no longer cover their living costs.

Such inequality surrounding pension systems points to injustice between Internet workers and SOE workers: Internet workers experience difficult working conditions, such as long working hours without reasonable rewards, while needing to pay into their pension fund. In contrast, SOE workers have good working conditions and benefit from a state-secured pension. In this sense, the higher middle class, such as SOE workers, seems to have better working conditions than the lower-middle class, such as the Internet workers, because of the

support they receive from the state and companies—the bureaucratic capitalist class, which I clarify later.

In the contemporary Chinese context, there is another issue links such inequality to exploitation: pension corruption. Workers are worrying about their lives after retirement, even though they pay into a pension fund every month, because government officials might embezzle their pension before their retirement. For example, there were several scandals regarding pension corruption from 1993 to 2010: around £8.9 million of pension money was embezzled in Guangzhou in 1993 (Youth Times 2012); £0.86 million pension money was embezzled in Taiyuan in 2003 (Youth Times 2012); and £32 million pension money was embezzled in Shanghai in 2006 (Youth Times 2012).

These news reports make workers feel unsafe and insecure about their work, especially about life after retirement. As Monica says:

> I'm not sure whether I could get back my pension after retirement, because it is possible that some officials have already embezzled it before I retire (Monica, HR worker at Grand, observation journal).

This pension corruption indicates that government officials appropriate workers' labour efforts, shown as the money they pay into their pension fund. To take a more structural perspective, this is resulted by an appropriation of labour of a low class by a high class: The low class's labour is "robbed" by the high class via acts of corruption, due to the strong political power to allocate social resources and control the lower classes owned by the bureaucratic capitalist class. This makes "the poor becomes poorer, while the rich becomes richer". In other words, the bureaucratic capitalist class exploitation of labour of the lower-middle class results in insecure experiences in Internet workers' working life.

Some of my interviewees even state that they could not imagine their lives after the age of 40 in the Internet industries:

> We [Internet workers] sometimes made jokes that we might die before [our] 40s […] To be honest, I cannot imagine my life after [my] 40s. Maybe I will leave the industries […] (Galeno, technical worker in the Product Administration Department at Campus, 24th August 2011, interview)

Galeno's recognition of high risks in the Chinese Internet industries echoes Gill's (2002) findings in her study of new media industries: Work in new media industries is characterised by issues of insecurity, low pay, and long working hours. These unsafe and insecure working conditions, such as lay-offs, *karoshi*, and unguaranteed pension fund, make Internet work unstable and precarious, though there are other things that make it precarious, such as long working hours and low pay. These precarious and risky working-life experiences of workers in the Internet industries, answers my question addressed in the beginning of this paper, specifically how these workers are involved in the global value chain. I now turn to explain why workers still stay in the industries, despite the bad working conditions.

4.4. Why Don't Internet Workers Leave the Sector? Autonomy?

As I pointed out earlier, Internet work has been fetishised in recent years because some workers have become millionaires by receiving companies' stocks. Meanwhile, the Internet work is fetishised also because of offering a high level of autonomy to the workers. It is worth to ask, whether autonomy is the force of keeping Internet workers in the industries, despite the difficult working conditions.

Hesmondhalgh and Baker (2010, 39–44) clarify autonomy in the cultural work with two concepts: Workplace autonomy and creative autonomy. Workplace autonomy refers to the degree of workers' self-determination within certain work situations, such as how they balance their work and life in their daily practices. Creative autonomy refers to the freedom in terms of practicing creativity. Here, I focus on workers' self-determination in their work practices and creativity, under the pressures that are exerted by the state and firms.

It is easy to understand that workers' freedom of self-determining their project is affected by companies. In some cases, Internet workers are forced by companies to conduct some projects that they are not good at. For example, during my observation, all workers in some technical departments in Grand, no matter what areas they were specialised in, were encouraged to learn developing Android—an open source operating system, which was the next key project for the company. It seemed that workers were "encouraged" to pick this option, but the company issued a new rule to process the program: Department leaders would have deductions from their salaries, if 30% of the employees in their departments could not pass the Android test. Put simply, the workers were forced to learn new technologies and conduct new programs without any consideration of their capabilities and interests. Two workers in the operations department told me that they needed to conduct the Android project at the same time as learning the skill, which was quite stressful to them. Therefore, the workers involved in the Android project did not have any freedom to decide which projects to carry out.

However, in both Internet companies, there are also workers who consider themselves to have a considerable degree of freedom to self-determine practices and creativity, such as workers in the online novel department in Grand.

The main job of workers in the online novel department is online editing. Their work includes managing online writers' writing and emotions. For example, when online writers face difficulties writing novels, these online editors are responsible for cheering them up, providing ideas, searching writing materials, and even suggesting structures for their stories. These editors are allowed a high level of freedom in determining these practices, such as deciding when and how to manage the writers and novels.

Such authorisation of their high level of professional autonomy covers some disadvantages within the work: The workers need to work day and night without receiving equal rewards. In order to maintain good relationships with the online writers, who usually start their writing at night because they are only part-time writers, these editors need to work until late at night. Surprisingly, although they carry out such day and night overtime, these editors receive just £300 a month without any overtime pay compared to other full-time workers' £1,000 monthly pay.

Thus, it might be claimed that some Internet workers, such as workers in the online novel department, stay in the industries, because of the high level of autonomy given by companies in their daily practices and creativity, though there are other difficult working conditions along with such autonomy. It then becomes necessary to ask, why Internet workers suffer such ambivalent working conditions—excessive working hours with unequal pay, lay-off without protection from unions, insecure work status, and certain autonomy. Below, I adopt Eric Olin Wright's concept of exploitation to answer this question.

5. The Class Analysis Approach

Erik Olin Wright (2009) illustrates three approaches relevant to class analysis in order to clarify his approach towards exploitation: Stratification research, which defines classes with "the attributes and material life conditions of individuals" (102); the Weberian approach, which centres on "the ways in which social positions afford some people control over economic resources while excluding others" (102); and the Marxist approach, which regards classes as "being structured by mechanisms of domination and exploitation, in which economic positions accord some people power over the lives and activities of others" (102).

The stratification approach focuses on class background, which consists of attributes such as sex, race, religion, age, education, and material life conditions, which refers to adequate income, dire poverty, and pleasant suburban houses. This approach identifies the middle class as people who "have enough education and money to participate fully in the vaguely defined 'mainstream' way of life (which might include particular consumption patterns, for example)" (Wright 2009, 103). But, as Wright acknowledges, this approach lacks serious consideration of the injustice and inequalities between different social positions, such as why some jobs are better than others.

The Weberian approach focuses on the unequal "opportunity hoarding" (104), which highlights the restricted access to certain positions. For example, high levels of education are restricted to the upper classes, because of the high tuition fees. Good education then further benefits the upper classes, as it usually relates to good jobs. In other words, unequal locations within market relations are causally connected to unjust opportunity hoarding among different social positions. According to Wright (2009), this approach is usually adopted by sociologists to analyse American society, where the middle class is defined by "mechanisms of exclusion over the acquisition of education and skills" (106). In Wright's discussion, the Weberian approach has a critical difference to the stratification approach, as it indicates that, "the economic advantages gained from being in a privileged class position are causally connected to the disadvantages of those excluded from such positions" (106). Put simply, the upper class's economic advantages are causally related to the lower class's disadvantages. Breen (2005) has discussed Weberian understandings of the mechanisms sustaining the privileges of advantaged classes in terms of the concept of "life chances". Life chances are chances that "individuals have of gaining access to scarce and valued outcomes" (43). He then claims three aspects of the distribution of power in society, which is widely adopted by Weberian approach, as factors that influence the distribution of life chances: Classes, status groups, and parties. All these dimensions overlap, while none of them can be reduced to others. The status groups imply "some level of identity in the sense of some recognised 'positive or negative social estimation of honour'" (Weber 1978, 932; Wright 2002, 834). In other words, members of a status group are conscious of being members of the group. Wright (2002) points out that Weber distinguishes status from class by highlighting the different mechanisms through which they shape inequalities of the material conditions of people's lives: Status affects people's well-being with 'the monopolisation of ideal and material goods or opportunities' (835); by contrast, class influences people's well-being via economic assets that people bring to market exchanges. Weber distinguishes status groups from classes by highlighting members' consciousness, and regards classes as objective places.

The Weberian approach usually relates inequalities between different classes to different life chances: Workers are given different chances to access to scarce and valued outcomes. Both Weberian and Marxist approaches agree that occupants of different classes enjoy different life chances, though they provide different schemata for understanding class. The Weberian approach might understand these inequalities and injustices in terms of salary and benefits shown above, as a form of exploitation, because they show inequalities in people's daily experiences. But the Marxist approach, especially the neo-Marxist approach adopted by this research, understands exploitation and domination as the mechanism linking different class locations to variations in life chances. According to Wright, the Marxist approach focuses on mechanisms of exploitation and domination. Unequal opportunity hoarding does not only relate to restricted access to certain positions and resources, but also depends on the ability of the exploiting/dominating group controlling the labour of the exploited/dominated group. Put simply, this approach highlights "an ongoing relationship between not only the *conditions* but also the *activities* of the advantaged and disadvantaged" (108). The traditional Marxist approach distinguishes three class locations based on ownership of means of production: The capitalist class, the petty bourgeoisie, and the working class.

Some theorists in the 1980s argue against this Marxist approach to class locations, stating that the working class has diminished or even disappeared in capitalism, especially the manual working class, which only occupies a small part of the workforce, and that white-collar workers are already in the position of the middle class. However, Callinicos (1983, 193–195) claims that many people still occupy the position of the working class, even though they are not engaged in manual labour in Marx's industrialist capitalism. For example, because of the industrialisation of office work, clerical workers are doing similar work to manual workers and suffering from a similar working condition to manual workers, with the massive introduction of new technologies. Therefore, they are in the same position as the working class, as manual labourers, because they are "compelled to sell their labour-power in order to live" (193), even if they do non-manual work. As a result, Callinicos argues that the change in class location and class relations since Marx's period is "a shift in the structure of the working class, not its

abolition" (195). In later work, Callinicos (2004) introduces Wright's work on class to explain the fragmentation of class structure in contemporary capitalism. As Wright (1985) argues, class locations in modern capitalism are contradictory, as some positions share properties of both labour and capital. For example, managers perform some functions of capital by directing others' work, but still sell their labour-power in order to live.

In the book *Classes*, Wright (1985) explicitly introduces his framework of contradictory class locations and fragmented class structure. He argues that Marxist criteria for class are an approximate framework for class structure in capitalism, rather than an elaborated classification. He then develops a much more complex typology of class in capitalism, where he divides typology into two parts: Owners of means of production and non-owners. Among these non-owners, their locations are divided by organisation and skill/credential assets. The class locations of wage labourers in a capitalist society are classified into expert managers, non-managerial experts, and non-skilled managers, etc. Wright (1996) further modifies this typology of class locations in his later work by specifying three dimensions that clarify class relations: Property, authority, and expertise/skill, which is where questions of symbol making and manipulation come in. The property dimension consists of employers, the petty bourgeoisie, and employees; The authority dimension is divided into managers, supervisors, and non-managerial employees; and the expertise/skill dimension contains professionals, skilled employees, and non-skilled employees (704).

Wright (2009) aims to move beyond the traditional Marxist approach to class analysis by developing a detailed typology of class locations. He identifies certain key aspects that constitute the new class structure of his model: The mechanism of exploitation and domination in the traditional Marxist approach, the mechanisms that sustain the privileges of advantaged classes in the Weberian approach, and the individuals' class locations in the stratification approach. He argues that a completely elaborated class analysis needs to combine the 'macro-model of conflict and transformation with the macro-micro, multi-level model of class processes and individual lives' (111) (see Figure 3). Put in another way, Wright argues that individuals' lives depend not only on the micro-model of attributes and material life conditions, but also on the macro-model of social conflicts and transformations where their lives take place.

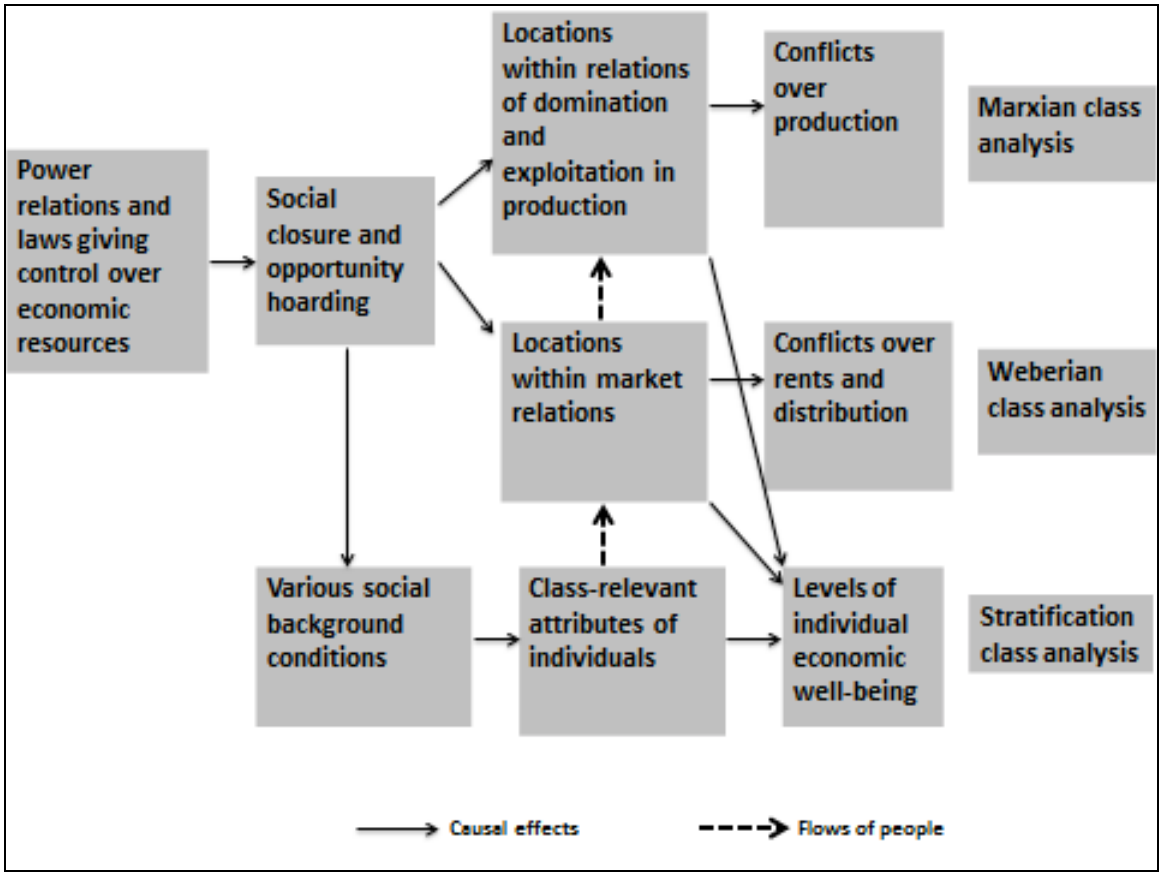

Figure 3: Combined class analysis: macro and micro processes (Wright 2009, p.111)

Wright's work (2009) then suggests a necessity to analyse class locations by locating individuals' lived experiences, such as "class background", in the context of social conflicts and transformations. It is no longer the problem of individuals who fill these positions, but rather, it is important to recognise the mechanisms shaping the privilege of certain class positions. As Wright points out, the middle-class problem is not who is excluded from the position, but is the fact that "there are mechanisms of exclusion that sustain the privileges of those in middle-class positions" (109). Likewise, I adopt a neo-Marxist class analysis approach, which combines both the macro model of transformation and the macro-micro model of individual lives. It is not my interest to just identify the scope of the Chinese middle class, by clarifying who is excluded from the position; rather, my aim here is to recognise the important and unique positions of Internet workers in the general Chinese social structure, and to clarify the mechanisms that sustain and change their unique positions (probably privileged positions) in the Chinese context, which result in inequalities in their working lives, as shown in section four.

6. Why Bad Working Conditions? Exploitation?

6.1. The Lower Middle Class: Chinese Internet Workers

Based on Wright's model of class structure, here, I explain Internet workers' position in the Chinese class structure, and clarify how certain mechanisms shaping their working lives. So (2003) points out that a new dominant class emerged in China during the process of privatisation of SOEs in 1992: Cadres set up their own businesses, which at times cooperated with foreign capitalists, by usurping resources from SOEs where they had executive positions. Capitalists also joined the existing structure using bribery to access to the market and gain resources. The new partnerships between cadres and capitalists enabled the new private sectors to "save on the additional costs of pension schemes, health and welfare insurance,

environmental protection facilities" (368), which ultimately led to the deterioration of working conditions in private enterprises.

Such discussion highlights that the bureaucratic capitalist class accumulate capital via appropriating lower classes' efforts, which ultimately leads to the deterioration of working conditions. The class typology in the contemporary Chinese context is complex, but my focus in this paper is the low-class location of Internet workers, due to which the labour of this class is appropriated by another higher class.[1]

In the Western context of the UK cultural industries, Hesmondhalgh and Baker (2010, 68–69) place creative workers in these industries principally in a middle-class class location, although they acknowledge that there are various classes involved in cultural production (such as working-class cleaners). Based on Wright's schema, which is also a fundamental framework for this study, they claim that most creative workers in the cultural industries occupy lower-authority, higher-skilled positions, such as skilled workers with little managerial power.

However, in the Chinese context, I argue that creative workers' location in the middle class, such as Internet workers' location, is not only decided by their skills and managerial powers, but also decided by their family backgrounds, work units, education level, and political authority (see Figure 4).

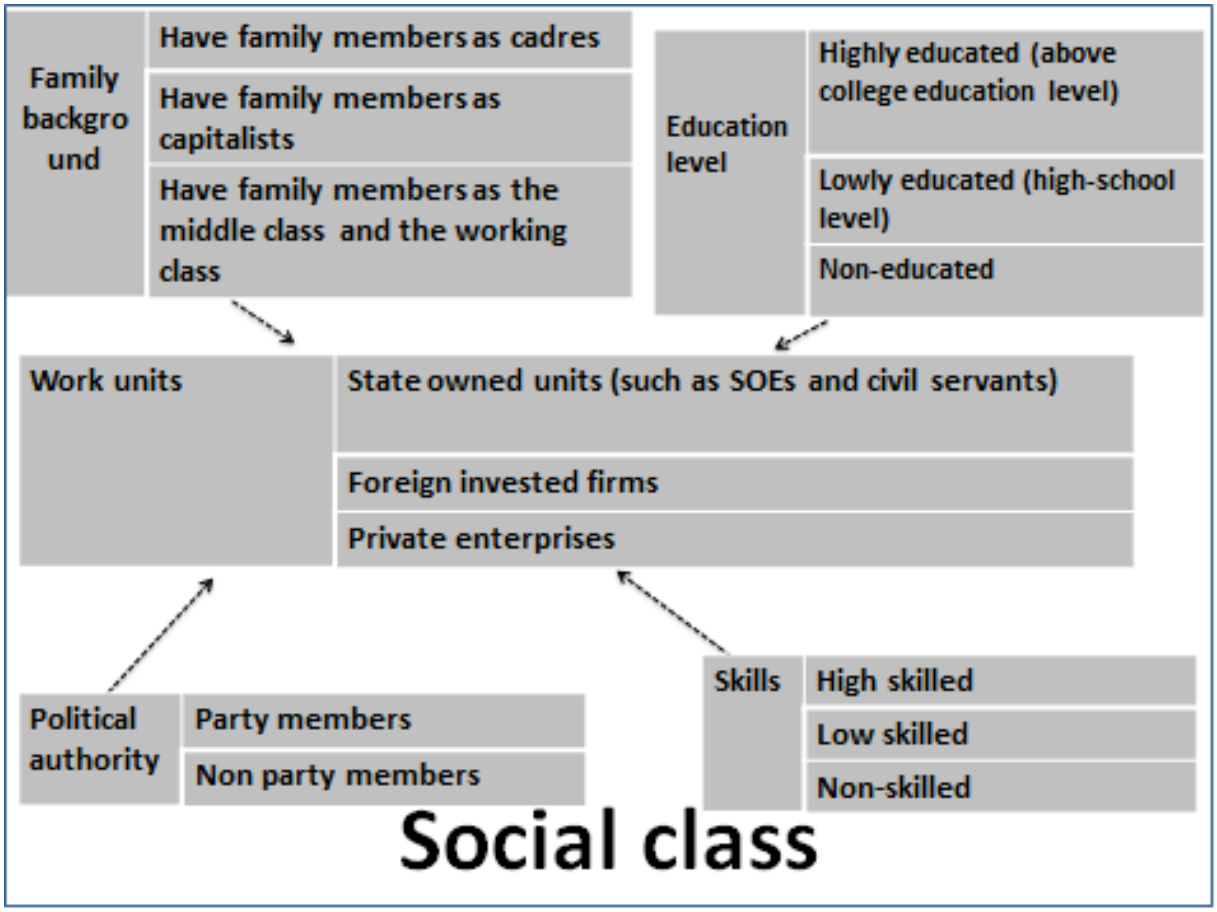

Figure 4: Typology of Chinese middle class

According to Figure 4, education level, family background, political authority, skills, and work units generally decide individuals' positions in the middle class: Workers in SOEs and civil servants have higher positions than private enterprise workers; workers who are highly edu-

[1] Also present in the Chinese social hierarchy in the post-1992 period were various other classes, such as the petty bourgeoisie and small employers.

cated have higher positions than workers who are not; workers who have family members as cadres have privileged positions; party members are more likely to be guaranteed stable work and lives than others; and high-skilled workers have more possibility to have well-paid jobs than others. It is hard to quantitatively evaluate the influence of these five factors on individuals' locations in the middle class, such as whether individuals who are not party members but have high skills have higher positions than individuals who are party members but work in private enterprise, and it is not my aim to do so here. Instead, I highlight these issues to give a variation within classes to analyse Chinese Internet workers' social class.

As I stated in section two, most Internet workers in China are working in private enterprises, which are excluded from certain advantageous resources that are only available for SOEs. Due to the inequality between SOE workers and workers in private enterprises, which I illustrated earlier, it is possible to say that large numbers of Internet workers do not have family members in the bureaucratic capitalist class, who have priority to send their offspring to beneficial jobs, such as SOE work and civil servant positions.

Most of these workers still conduct intellectual work, which is defined as middle-career (Zhou 2008, 114-117), though based in private enterprises, which are inferior to SOEs, due to their limited access to certain advantageous resources. As I pointed out earlier, in the existing media reports and academic research, there is no survey conducted amongst Internet workers to report their education background and income. Instead, according to a sample survey conducted amongst IT workers (workers in the hardware market) in some big cities (such as Shanghai, Beijing, Wuhan, and Dalian) in 2010, 97.13% workers were educated at college level (Li 2010, 128). This figure enables us to deduce that a large number of Internet workers are also educated at colleges. Indeed, according to my qualitative research, all the participants and interviewees are educated at college level, which might help us recognise that generally most Chinese Internet workers are highly educated.

Likewise, as little research investigates Internet workers' income, it is hard to give an authoritative figure about Internet workers' income. Rather, according to an annual report about salary information in various industries, which was conducted by a professional HR service company, PXC, in 2013, the increase in salary rate in the Internet industries was 16.2%, which was the highest among all industries (excluding SOEs and civil servants' positions) (GRlib 2013). Meanwhile, according to Guangzhou Daily, a local newspaper, annual salaries of fresh graduates who find jobs in the top 5 Internet companies are between £10,000 and £15,000, which is a middle-level salary for most jobs (Gangzhou Daily 2013). This indicates that Internet workers have a high-level salary among jobs in private enterprises.

Though CCP intends to control big private enterprises via subsuming employees there into its party system, as its managerial slogan in the cultural industries indicates: "Control the big, let go the small" (O'Conner and Gu 2012, 4), it is still hard to find large numbers of party members in the Internet industries. For example, according to one of CCP's official magazines Oriental Outlook, only 9 Internet companies in Beijing had organised Party Committees until 2011, and there were only 2,680 party members in all Internet companies in Beijing, who were mostly in Baidu and Sina. Most of these members joined the Party after 2010 (Oriental Outlook 2013). In other words, large numbers of Internet workers are non-party members.

Unquestionably, as Hesmondhalgh and Baker (2010) claim, just as most cultural workers are highly skilled, either with professional skills or technological skills, Internet workers also have high professional or technological skills. Therefore, the picture here becomes clear: Most Internet workers are based in private enterprises, which indicates that they do not have family members in the bureaucratic capitalist class; most workers are college-educated with low political authorities, as they are non-Party members; and they earn high salaries among people in the middle-class location, as most of them are highly skilled. As I stated earlier, it is hard to evaluate Internet workers' location in the middle class with any sophistication with these figures. However, this generally shows that the Internet workers here occupy an inferior position to SOE workers and civil servants, but this does not indicate these workers have an inferior location in the Chinese social structure—the Internet workers still occupy more

privileged locations than those in working-class locations. In other words, most Internet workers occupy the lower position in the middle class.

6.2. The force behind the unequal working-life experiences: exploitation

After clarifying Internet workers' lower-middle class position, it is necessary to explain how certain mechanisms shaping these workers' working-life experiences, due to their class position. Following Marx's work, many theorists regard injustice as central to understanding Marxist ideas of exploitation (Callinicos 2000; Roemer 1982; Cohen 1985; Wright 1996).

Roemer (1982) pays particular attention to exploitation in existing socialism (Roemer 1982, Chapter Eight). He claims that exploitation still exists in socialism, and that socialist exploitation, based on the inequality in ownership of skills, is socially necessary at a certain stage. The historical task of socialism is to eliminate capitalist exploitation, rather than socialist exploitation. However, Roemer, as a follower of Marx who devotes considerable efforts to explain Marx's work, still shows his ethical concern about socialist exploitation, by asking "if a form of exploitation is socially necessary, what should one's attitude toward it be? Should its existence be endorsed?" (240). Roemer answers these questions with reference to the level of "social consciousness—how the people involved think" (248). He puts it thus: If the exploited fight against injustice, even though the revolution or rebellion is doomed to fail, the social necessity of the exploitation then should be questioned. Because of this, it would be morally wrong to accept a form of exploitation that seems to be socially necessary, without criticising it.

Cohen (1995) argues that Roemer correctly states that exploitation is not based on natural injustice, but that he is incorrect to indicate that an unequal product flow is unjust "only if it reflects an unjust initial asset distribution" (204). The work of exploitation needs to focus on the unjust exploitative allocation. This is because Roemer's work directs our interests to unjust asset distribution, which in Cohen's understanding is caused by the unjust product flow. As an alternative, Cohen states that it is necessary to focus on the "injustice of an exploitative allocation" (207) rather than the "injustice of the initial distribution" (207), as the former generates the primary injustice that drives the latter to be unjust.

Wright (1985) criticises Roemer's work on exploitation because of the elimination of class relations in his analysis of injustice. For example, Wright states that Roemer fails to point out that "real transfers from one actor to another" (74) create unjust inequalities. According to Wright, Roemer fails to introduce the notion of dominance in his game-theory approach to exploitation. As an alternative, Wright defines exploitation as a process that contains both "economic oppression" (1985, 74) and the "appropriation of the fruit of the labour of one class by another" (74). As a criterion of exploitation, the benefits of the exploiter must depend on the work of the exploited.

Wright (1976, 28–29) claims that exploitation needs to be discussed within varied modes of production, as different forms of exploitation correspond to different modes of production. For example, workers in industrial capitalism are exploited in a way that is distinguished from workers in the earliest capitalism: on the one hand, they cannot control the labour process as producers in cottage industries did, because they are gathered in factories; on the other hand, the labour force is deskilled and the production process is fragmented, because of the introduction of new technologies in factories. Meanwhile, capital is not a commodity in existing socialism as it is traded in capitalism. Burawoy and Wright (2002: 478-480) distinguish existing socialism from Marxist socialism by using the example of Soviet communism, which is entitled "state socialism". They claim that state socialism refers to a central planned system: a class of "planners" take charge of the "redistribution of surplus", which is extracted from a class of "direct producers". This extraction is legitimised in the name of "the superior knowledge of the planner about the needs of the people" (479).

Roemer (1982) divides modes of production into four categories, based on the different forms of exploitation: Feudal exploitation, which is based on injustice generated by unequal distribution of labour power assets, in which lords and serfs are the main classes; capitalist exploitation, which is based on injustice generated by unequal distribution of alienable as-

sets, in which relations between bourgeoisie and proletariat are the main class relations; status exploitation, which exists in the existing socialism, a historical stage between capitalism and socialism; and socialist exploitation, which is based on injustice generated by unequal distribution of inalienable assets, in which experts and workers are the main classes. In status exploitation, exploiters control labour power and property because of their high status in the social structure. This is different from the injustice generated by either means of production or skills.

Wright (1985) agrees with Roemer that skill-based exploitation would exist in a Marxist socialist society, and it could only be eliminated in Marxist communism. But Wright indicates that Roemer's concept of status exploitation is problematic in two ways: First, it is not necessarily related to production at all and second, it is hard to distinguish it from feudal exploitation. As an alternative, Wright (1985) points out a post-capitalist mode of production that exists between the stages of capitalism and socialism, statism, which is based on organization asset. In this mode of production, bureaucrats and managers occupy the class location of the exploiter.

This is agreed by Callinicos (1983), who interprets that existing socialism is "bureaucratic state capitalism" (183), as "a state bureaucracy, which competes with its Western counterparts" (183) exploits the working class. In the context of the Soviet Union, socialism, or "bureaucratic state capitalism", did not *self-emancipate* the working class, as it claimed. The followers of the Soviet Union, such as China, reproduce this mode of bureaucratic state capitalism in their societies. Callinicos (2004) further explains his arguments in his later work. He states that the existing socialist societies are "state bureaucratic socialist, combin[ing] the statist and socialist modes of production" (223). This includes multiple occurrences of exploitation based on the unequal ownership of varied resources: "Skills, organisational assets, means of production, labour-power" (225).

Some theorists who work on modern Chinese society have acknowledged this exploiter class, which allies bureaucrats and capitalists. I have demonstrated such research in the last section, in order to clarify the social class of Internet workers. Here, I continue my argument from the last section, based on Wright's and Callinicos' work, recognising the social mode of production in modern China as bureaucratic state capitalism or bureaucratic state socialism. The bureaucratic capitalist class, which I defined in section five, occupies the location of exploiter class, with ownership of the means of production, organisational assets, and political authority. This class accumulates huge wealth by controlling labour power and the skills of the middle class and the working class. This activity of appropriation then generates inequality and injustice between the bureaucratic capitalist class, the middle class, and the working class.

In the Chinese context, the working class sells labour power in order to survive, as their livelihoods are not guaranteed by society. The bureaucratic capitalist class owns the means of production, such as factories/firms, raw materials, and telecommunication, and has the political authority to allocate these means of production. For example, executives in the party-controlled enterprises (the SOEs in contemporary Chinese society) and government departments own the main raw materials and economic resources, such as oil and telecommunication. Officials in the bureaucratic capitalist class with certain political power (similar to Wright's state power) and capitalists with certain economic power allocate these raw materials and economic resources. But what does the middle class own, and what are the relationships between the middle class and these other two classes?

Internet workers, as members of Chinese lower-middle class, own certain means of production, such as professional and technical skills, but this ownership is only helpful when they place it in the capitalists' service. According to Wright (1997, 19), this is the general problem of the middle class, who sell their labour power as they lack the means of production, while they do not regard themselves as the working class. Under the movement towards globalisation, precarious and uncertain work and life status are shared by workers in different social contexts, both in socialism and capitalism. Workers in Western societies share the severe economic pressure faced by Chinese Internet workers, which I showed earlier, as it becomes a general problem of the middle class, to use Wright's terms.

In the Chinese context, the bureaucratic capitalist class dominates the working class and the middle class, because of the ownership of the means of production, and the power to allocate these resources. It is the bureaucratic capitalist class, where officials and capitalists gain benefits from corruption and bribery, which appropriate the labour of other classes. Due to this, the wealth of the bureaucratic capitalist class is based on the labour efforts of the working class, who contribute labour power, and the middle class, who contribute skills.

Due to the inferior position in the middle class, Internet workers lack the power to allocate the resource they own, such as skills; instead, their labour efforts are appropriated by the bureaucratic capitalist class via long working hours, unequal pay, insecure work status, and unguaranteed pension fund. Such structural activity of appropriation, exploitation in Wright's explanation, thus, becomes the force behind Internet workers' poor working-life experiences. Here, exploitation becomes a mechanism to explain why Internet workers suffer bad working conditions, it is worth asking: Why do Internet workers still work in the industries, despite inequalities resulted by the exploitation?

7. There is still hope: agency of Internet workers

As I stated in last sections, Internet workers experience inequalities and injustice, such as unequal pays with long working hours, insecure work status, and unguaranteed life after retiring, due to the structural exploitation. But, this does not indicate that Internet workers accept such difficult working conditions, due to certain level of autonomy given by companies, without any acts of agency. Rather, Internet workers use various acts of negotiation and resistance to improve the quality of working life.

For example, some workers regard intervention from the state as influencing their practices and creativity in an unacceptable way:

> We [workers] definitely don't like the rule. We prefer to stand with users, who could bring us money. But, as the state could easily stop our service, we still need to follow the rules in certain ways […] (Galeno, technical worker in the Product Administration Department at Campus, 20th December 2011, interview)

Here, Galeno shows the necessity of balancing the state's requirement and Internet users' needs for free space in his daily practices; moreover, he states that some workers feel unsatisfied with the state's intervention. Thus, these workers, who are unsatisfied with such intervention, apply their professional knowledge and skills to acts of negotiation and resistance, in order to gain more autonomy.

For example, In an Election Meeting of Candidates of the National People's Congress in Shanghai, which took place during my fieldwork, representatives of workers in Grand expressed discontent about current working conditions, and made a case for more work-related benefits. They asked the local government to build a new kindergarten near the company in order to benefit the workers with children. They also raised the issue of overtime work in the industries. Moreover, these representatives questioned whether their voices could be heard by the departments responsible for bringing in changes via the Congress system. Since I left Grand two months after this event, I do not know the result of such bargaining. But the voices of the workers in this event indicate Internet workers' special forms of response towards state control and intervention. It is rare to hear the voices of other workers in the Chinese context, such as SOE workers.

This form of negotiation may not be so unusual in other geographical contexts, such as the UK, but such direct questioning of authority can hardly be found amongst workers in other industries in China. Internet workers' direct expression of discontent and their questioning of authority mark a fundamental shift in attitudes towards worker agency in the authoritarian Chinese context.

Here, I acknowledge workers' subjectivity and agency in such events. As Burawoy and Wright (2002, 474–475) claim, the exploited classes tend to resist the appropriation of their labour efforts. The exploited class–the lower-middle class–has the potential to resist the exploiter class–the bureaucratic capitalist class–via acts which attempt to eliminate inequalities

and injustice in their working life. This then creates potential for changing working conditions in the Internet industries in the future. I regard this as a sign of hope in contemporary Chinese Internet industries.

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Knowledge Workers, Identities, and Communication Practices: Understanding Code Farmers in China

tripleC 14(1): 312-332, 2016
http://www.triple-c.at

Knowledge Workers, Identities, and Communication Practices: Understanding Code Farmers in China

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Abstract: Extending the concept of "knowledge workers", this paper studies the identity dynamics of IT programmers from small companies in China. Through the discursive analysis of programmers' personal memoirs (collected via personal interviews and online ethnography), four themes of identity dynamics emerge: IT programmers demonstrate identification with professionalism and technology; they naturalize the high mobility and internal precarity of their work via discourses of the self and social improvement; the term *manong* ("code monkey" or "code farmer" in English) is used to support a sense of selfhood amidst high pressure schedules and "panoptic control"; the disparaging term *diaosi* ("loser" in English) is appropriated in order to activate a sense of self-expression and collective resistance regarding the programmers' working and living conditions. These four themes are integrated into: 1) hegemonic discourses of economic development and technical innovation; and 2) the processes of individualization among IT programmers on a global scale. Our findings suggest that being a knowledge worker means not only to provide professional expertise, communication, creativity and knowledge, it also interrogates questions of survival, struggle, and solidarity.

Keywords: Knowledge workers, Identity, IT programmers, CuDA, *Manong*, *Diaosi*

Acknowledgement: The authors wish to thank Professor Jack Qiu Linchuan, Professor Saskia Witteborn and the anonymous reviewers for their constructive feedback on an earlier version of this article.

1. Introduction

The widespread growth of the global digital economy and IT industries has been the subject of significant academic attention. The workers employed within tasks such as programming and software development, who contribute to the digital economy, have also received attention. Richard Barbrook (1998) has indicated that the digital economy is characterised by the use of new technology and the creation of new types of labour such as the one of knowledge workers. Knowledge workers provide products such as service, information, and ideas as well as the material tasks necessary for the creation of these products (Bell 1976; Drucker 1969; Fuchs 2014; Machlup 1962; Mosco and McKercher 2009). In the context of the information society, in which a significant number of personal, professional and social processes are being digitalised, the role of knowledge workers such as computer programmers in facilitating these activities cannot be underestimated. Knowledge workers play an essential role in the adoption of qualities like creativity, knowledge and communication, into the informational economy (Virno and Hardt 1996) and can thus be seen to form a crucial pillar of economic development.

The authors are far from the first to develop the term "knowledge worker". Substantial work has been done exploring the meanings, implications, and debates surrounding this type of work (e.g.: Bell 1976; Drucker 1969; Fuchs 2014, Machlup 1962; Mosco and McKercher 2009). While the term "knowledge workers" has traditionally been used to reference the intellectual labour of computer-based professions, according to Mosco and McKercher (2009, 23) it can also be applied to a broad range of vocations like "university professors, software designers, journalists, call-center workers and united parcel service truck drivers". In his book *Digital Labour and Karl Marx*, Christian Fuchs (2014, 359) analyses a "collective work force

Date of Acceptance: March 12, 2016
Date of Publication: May 15, 2016

that is required for the existence, usage and application of digital media" that he calls, "digital labour". Digital labour includes the computer based tasks of programmers and coders, but also encompasses the physical labour of those working to assemble digital devices and those extracting the materials from which such devices are made. Fuchs refers to the multi-step labour chain through which digital products are produced as the International Division of Digital Labour (IDDL).

This study aims to contribute to the better understanding of knowledge work by focusing on Chinese programmers working in small companies and their identity constructions. A widely deployed approach in previous studies on knowledge workers' identity highlights programmers as knowledge workers belonging to the middle or upper classes (Das 2001; D' Mello 2006; Ensmenger 2012; Fuller and Narasimhan 2007). For example, Das (2001) regards IT professionals as new middle-class heroes who are responsible for driving India's economic take-off and high flying IT economy. Ensmenger (2012), in his *Computer Boys Take Over*, indicates the significant roles computer specialists have played in the history of software development. By tracing the history of how "computer boys" established their independent role and identities within traditional hierarchical organisations, Ensmenger emphasises software professionals as a powerful force in modern society. Another coherent research stream exploring computer engineers and their identification is that of technology and hacker culture (e.g.: Kelty 2008; Levy 2001; Thomas 2002; Rushkoff 2010). In the very beginning of computer use in the 1950s, hacker programmers successfully established their "moral code", forming a collective identity dedicated to the free flow of information (Thomas 2002). Empowered by technology and coding, hacker programmers are usually thought of as mysterious, creative and highly technological. In this context, the hacker identity stresses co-operation and collaboration, as well as the innovative and disruptive use of technology (highlighted through examples like open source, hackerspaces, and maker culture). Here, programmers are pictured as a transformative force that can configure and bring about social change (Kelty 2008; Silvia 2014; Weber 2014).

It is not hard to see, either from a class, technology, or cultural perspective, that programmers and their identity are considered as middle or upper class oriented in such research. On the contrary, another research stream holds an opposite narrative analysis with regards to programmers' work and coding practices. It looks at the work performed by computer engineers at the bottom end of transnational production chains and often emphasises high precarity, highly exploitative work practices and the reality of a highly stratified work force within the global IT industry. For example, D'Costa (2002) argues that the development of the Indian software industry is embedded into the development of an uneven and combined Indian capitalism that produces entrepreneurial winners, who accumulate capital at the expense of the mass of digital workers. Drawing on ethnographic fieldwork in India and Australia, Xiang (2007) describes how the flow of international capital dominates the job hunting dynamics of Indian programmers, while adding that the practice of global body-shopping creates uncertainty and precarity in the programmers' working environments. In her analysis of the labour conditions in Foxconn factories, Sandoval (2013) explains that the development of ICT is not only about technological innovation and creativity, but also involves the widespread exploitation of digital labourers whose work is often unstable, alienating and unregulated. The spirit of the current paper is to join these works in the third research stream in exploring knowledge workers in lower social classes by investigating how knowledge labourers perform their social identities in the particular context of small software companies in China.

Knowledge labour performed by IT programmers in China is a worthy area of study. As the world's factory at the beginning of the twenty-first century, China and its massive knowledge workforce play an important role within the processes of global commerce and informationalisation (Sandoval 2013; Xia 2014; Xiang 2007). Over the last decade, Chinese software exports have been increasing at a significant speed. According to a report by the Chinese MIIT (Ministry of Industry and Information Technology,中华人民共和国工业和信息化部), China's software export value reached 48.7 billion US dollars in 2013（about 0.51% of the total GDP）. The report also states that in 2013 there were 3108 foreign-funded software

companies in China with a collective value of 113 billion US dollars (about 1.19% of the total GDP). Chinese programmers, especially low-level employees, form part of the IDDL as they participate in a transnational labour chain performing outsourced tasks and producing software that is used in international services and business transactions. By exploring the identity dynamics of Chinese workers in small software companies, and connecting these dynamics with social discourses in contemporary China, this study intends to add to our knowledge of the lives, social identities, and discourses of the working class in the information society.

The structure of this article is as follows. First, we discuss the existing literature concerning knowledge workers and the IT industry in modern China. Next, IT programmers' memoirs are analysed to find out how IT programmers perform and maintain their social identities during their work and daily life. The programmers' memoirs are then explained in the light of social discourse in modern China. Finally, further implications concerning our findings on knowledge workers are discussed.

2. Knowledge Workers

The concept of knowledge workers has developed significantly since its inception. Fritz Machlup (1962), Peter Drucker (1969), and Daniel Bell (1976) are among the first who developed the concept of the "knowledge worker". Machlup (1962, 267) noted that the term refers to either people employed by "a collection of industries producing knowledge" or "a collection of occupations producing knowledge". According to the economist Peter Drucker (1992, 264), the concept of the knowledge worker refers to "the man or woman who applies to productive work ideas, concepts". Bell (1976, xvi) did not use the term "knowledge labour", but stated that the "knowledge class" is the fastest growing group in post-industrial society, and that traditional labour theories will be replaced by knowledge value as social production becomes increasingly informationalised.

There may be some narrow differences between these three conceptualisations of knowledge workers, but they converge on the ideas that a) the rapid increase in the number of knowledge workers is brought about by the development of knowledge industries, and b) that the term "knowledge worker" addresses the production and distribution of information, technology and creativity. Unlike "audience labour" (Smythe 1977) or "free labour" (Terranova 2004), knowledge workers are found in professional occupations and employ specific vocational skills. Kleinman and Vallas (2001) imply that the very term "knowledge worker" indicates a process or a class distinction, in which knowledge and expertise are more esteemed than other types of work. Janz et al. (1997, 878), who describe knowledge workers as relatively "high-level employees", support this distinction. Such workers can apply their knowledge to develop and design new products or services. Indeed, while many previous definitions of the knowledge worker perceived knowledge labour as diametrically opposed to physical labour (See: Drucker 1992), recent explorations see knowledge workers as being composed of a vast range of professions, including those that include physical tasks.

Vincent Mosco and Catherine McKercher (2009, 24-25) maintain that the definition of knowledge labour should not be confined to professionals only and should include any labourers that "handle, distribute and convey information and knowledge". Building on this understanding, Fuchs (2014) argues that digital labour is characterised by industrial rather than occupational dimensions, that is to say, any activities which contribute to the digital economy can be seen as digital labour regardless of their specific occupational labels. By making this assertion, Fuchs seeks to highlight the diverse range of occupations involved within the digital economy, the connection of labour processes which might otherwise appear distant and the unifying effect that digital labour has on different workers around the world (i.e. the IDDL).

In terms of research on engineering, the juxtaposition of programming labour and manual labour generates a seemingly contradictory analysis model within the conceptualisation of knowledge workers (Downey and Lucena 1995): On the one hand, computer engineers can be seen as a powerful group due to their mastery of technology. On the other hand, engineers may feel powerless and marginalized since "a microworld can become a challenging arena for an adult quest for power and control" (Edwards 1996, 172). Hacker (1989; 1990)

claims the pleasure and the sense of achievement software engineers derive from their work is closely related with the power they hold. Florman (1976) echoes Hacker's analysis by noting that for engineers, technology can be seen as a symbolic power that extends their limited sense of potency. Through working as a group, programmers can then reproduce patterns of homosociality and form a collective identity (Deetz 1995; Mellström 1995; Murray 1993). Valk and Srinivasan (2011, 44) indicate that women IT professionals value their role as programmers, and defend their identity through terms like "challenge, accomplishment, morale boost, satisfaction of using skills, drive to explore, drive for self-development, growth as a person, and personal satisfaction derived from work".

On the other hand, a body of critical research on IT professionals contends that programmers' work experiences are not always positive. Academic studies have shown that programmers frequently experience precarity and risk. Arora et al. (2001) conducted research on the Indian software industry and concluded that Indian IT workers are in a disadvantaged position since they tend to conduct simple and repetitive outsourcing work for corporations in Western countries. Xiang (2007, 5) shared this opinion in his "global body shopping" study, indicating that "body shopped" Indian programmers undertake "donkey work" and receive a rather low salary. In a Chinese context, Xia's (2014) ethnographic study indicates that most Chinese Internet workers reside in the lower middle class and suffer from high exploitation as tiny cogs in a massive global system.

3. ICT and *Manong* in Modern China

Although a latecomer to the digital economy, the development of the Chinese ICT industry is already quite expansive. Furthermore, as a result of the current climate of economic growth in China, the Chinese ICT industry has experienced significant expansion in recent years. According to the OECD Outlook database (http://www.oecd-ilibrary.org/), China has established itself as one of the most important countries for the production and use of ICTs. From 2004 onwards, China has been the biggest exporter of ICT products, which is due to its role in assemblage and manufacturing, whereas software is not such a major part of the Chinese ICT industry as it is in other countries. In 2013, its exports accounted for 27.4% of the worldwide total. While using the wide frame of the Chinese IT industry, this project will focus its investigation specifically on workers within the Chinese software industry. Generally speaking, the software industry involves software products and software services, including development, marketing, sales, and maintenance. Its product scope is rather extensive including operating systems, computer/laptop applications, network management tools, and various enterprise or personal programs. Spurned by the dramatic expansion of the IT market in China and worldwide, the software industry has become the fastest growing section of the Chinese IT market. Based on the report of Gartner (http://www.gartner.com/), at the end of 2013, the total market size of the global software market totalled 350 billion US dollars (0.46% of the global GDP)..With the growth of the software market as well as Beijing's continuous focus on informationalisation in all walks of life, including e-governance, information monitoring, stock market trading, logistics and online shopping, China can be seen to be in the stage of building a vast software empire.

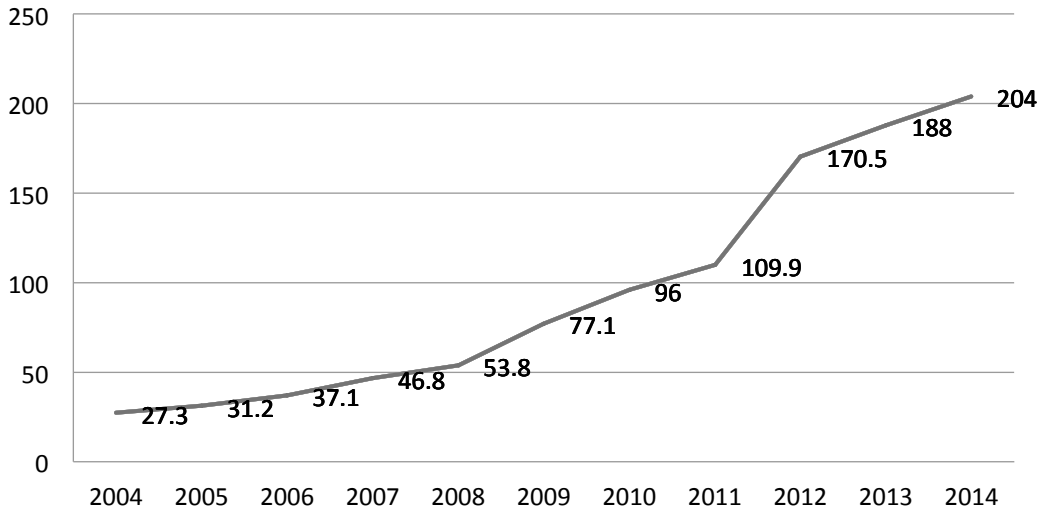

Figure 1.1: Growth of ICT market output in China in billions of USD, by year-end data
(Data source: IDC Research Report (2004-2014))

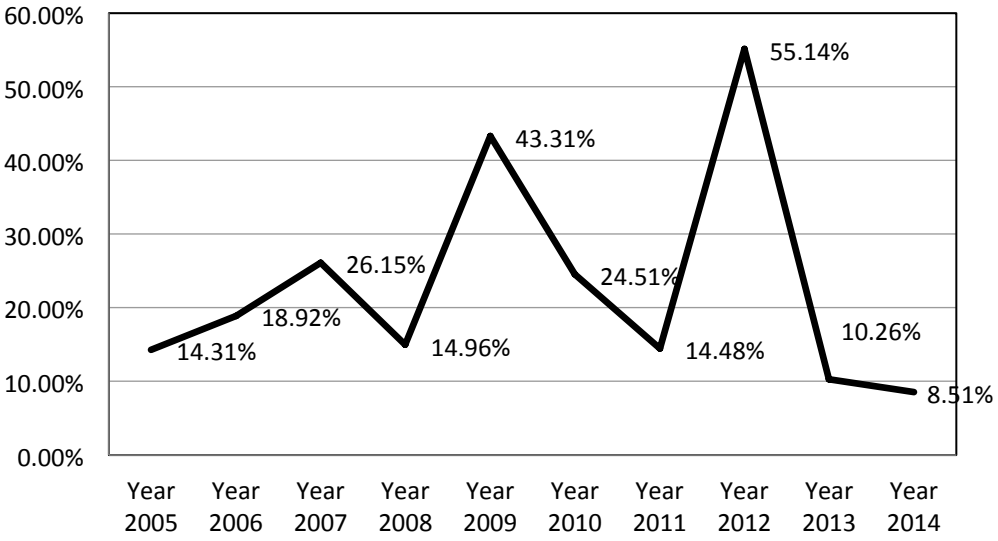

Figure 1.2 Relative growth of the ICT market output in China, in percentage by year-end data
(Data source: IDC Research Report (2004-2014))

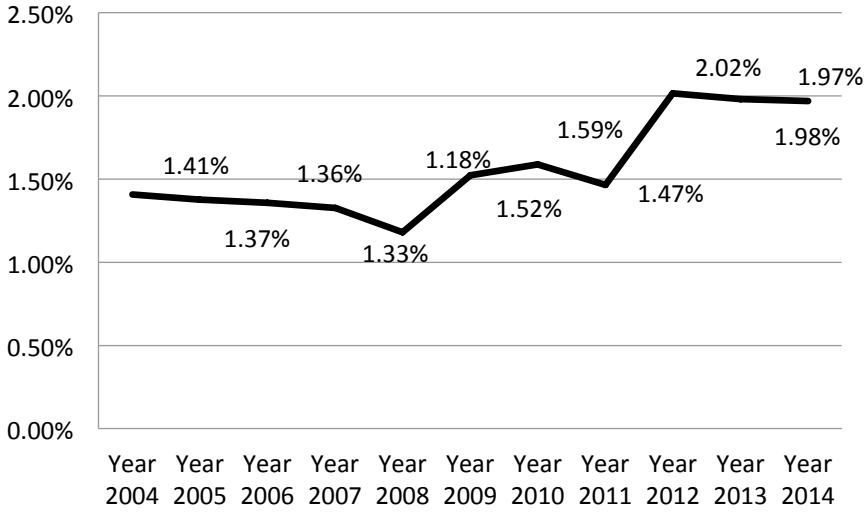

Figure 1.3 Share of the ICT industry's output in the Chinese GDP, in percentage by year-end data
(Data source: IDC Research Report (2004-2014))

In China, many different levels of software enterprises, co-exist including domestic giants like Baidu and Tencent, large foreign owned companies like Microsoft, joint venture companies and varying tiers of smaller domestic companies. In 2014, there were 37,102 software companies in China with 6,183 new companies entering the market between 2013-2014 (MIIT, 2013). This environment of prosperity is buoyed both economically and socially by the emergence of giant Chinese IT companies like Tencent ("腾讯"), Huawei ("华为") and Alibaba ("阿里巴巴"), which has also fostered a new generation of rich entrepreneurs and professionals, like Jack Ma (馬雲), the founder and CEO of Alibaba Group; Pony Ma (馬化騰), the founder of Tencent Inc., as well the "Musketters of the Internet", William Ding (丁磊), Charles Zhang (張朝陽) and Wang Zhidong (王志東). They have become kind of ideological hero entrepreneurs in China.

However, there are two salient differences between the Chinese and Indian software industries. Firstly, compared with India's software industry, where outsourcing and offshore production account for a considerable percentage of India's IT industry as a whole (Fuchs 2014), China's software industry takes on a slightly different form. In China, most IT work is performed for the domestic market rather than for offshoring or exporting (MIIT 2013). However, as many of the software companies that cater to the Chinese market are joint ventures or foreign owned, there is still sizeable foreign investment within the Chinese software industry. Moreover, outsourcing does still form a valuable component of the Chinese IT industry. In order to reduce their labour cost, Western companies outsource coding and testing work also to software companies in China. This outsourcing work first goes to big companies, and then those companies dispatch parts of it to smaller companies, resulting in a hierarchical structure, in which the most repetitive and laborious tasks are largely borne by the smallest software companies. Thus, thousands of small software companies in China are involved in the lower end of the global software production chain.

Secondly, compared with Indian programmers, who are usually overeducated for their job (Upadhya and Vasavi 2008), programmers in China face a different situation. While in India and the West software professionals have been described as the new middle class who are mostly well-educated, professional, qualified and technical (e.g. Fuller and Narashimham 2007; Das 2002), according to the 2014 The Electronic Information Industry Statistics Yearbook of China (MII 2014), in 2013 more than 40% of Chinese workers in software and engineering were trained at vocational schools（see figure 2). In vocational schools, students receive training for anywhere from a few months to two years, and then become low-level

programmers or '*manong*' in small Chinese software companies. While the majority of Chinese software engineers do in fact hold a Bachelor degree, it is worth noting here the rigorous hierarchy, in which Chinese universities are ranked. Potential employers see "211" or "985" universities as much more appealing than other institutions. There are no official statistics on the educational backgrounds of software programmers in different levels of companies, but a degree from a "211" or "985" university (which account for less than 5% of the total number of universities and colleges) is considered the benchmark for entering big IT companies like Microsoft, Alibaba, Baidu or Tencent. Thus, many graduates from lower ranked universities often end up working unappealing jobs in small companies.

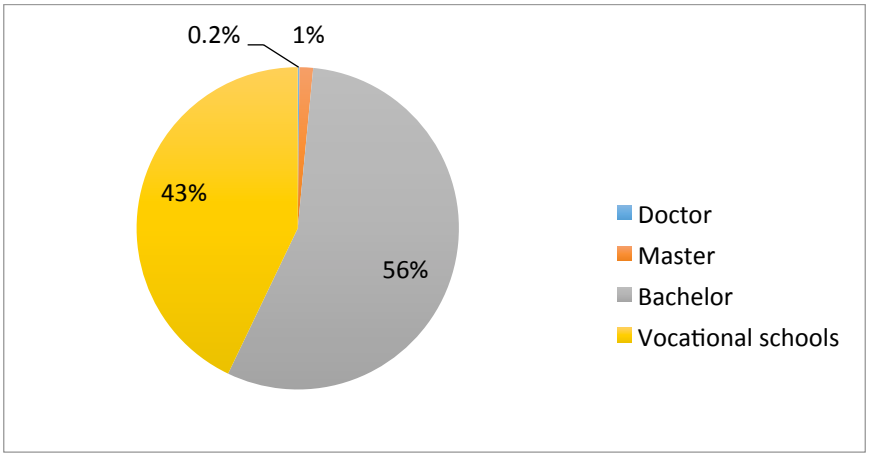

Figure 2: The Educational Background Structure of Software and Engineering Graduates in 2013 (MII 2014)

The International Division of Digital Labour, the Chinese domestic IT industry structure, as well as the educational background of programmers lead to a hierarchical distribution of programming labour. China does have a labour aristocracy of upper class software workers (Engels 1892; Fuchs 2014), like the engineering professionals working for multinationals or big domestic companies such as the BAT trio (Baidu, Alibaba, Tencent). They are programmers who are well educated and gain a higher salary, but they only account for a small part of the programming army in China. According to Yue (2015), above 90% of the programming labour in China works within small software companies, in which the total number of personnel is less than 100. It is interesting to see that some lower end Chinese IT programmers working in these small companies use the term *manong* to identify themselves or describe colleagues. The term *manong* was itself coined by low-level programmers in China in order to characterise their repetitive coding work and poor conditions. Owing to the extensive use of humour and vivid expressions commonly employed within Chinese Internet platforms, the term soon gained usage as a collective name of all IT programmers in modern China. In English, *manong*'s meaning can be literally translated as "code farmer", with its meaning being similar to that of the slang term "code monkey". As time has passed, *manong* has become a collective name conflating various kinds of software developers, computer programmers and IT professionals. While job titles and positions may vary in different companies, the main work *manong* conduct involves writing, testing, and debugging programmes that computers follow to perform different functions.

For this study, the researchers took small private software companies in the cities of Beijing, Shanghai and Shenzhen as our study subjects. The rapid growth of small Chinese software companies is a relatively new phenomenon and their prosperity helps to attract the majority of computer programmers and ICT workers in China. Compared with giant companies like Tencent, Alibaba and Baidu, small companies are characterised by their modest size (usually less than 100 workers) and flexible operations. Usually they are located in the prosperous high-tech centres of big cities such as Beijing Zhongguangcun Technology Park, Shanghai Zhangjiang Hi-Tech Park or Shenzhen Nanshan Hi-Tech Park. These firms' main work con-

sists of developing software platforms for other non-IT companies or undertaking outsourcing projects from big software companies. In order to survive in this highly competitive environment, the firms usually hire a small number of staff and perform a wide range of developing tasks. The bulk of computer programmers in China are young people, who migrate to big cities from rural China. A small minority of programmers are well-educated career programmers, but most are young and not-so-well-educated (See: Figure 2). IT programmers contribute a lot to the rapid development of the digital economy in China, but have thus far not been the object of much academic research. Questions like how Chinese programmers in small companies define and understand themselves and what roles they play as knowledge workers within the global IT industry remain unanswered. Based on the lack of research concerning knowledge labour within China, this paper addresses the following research questions:

1. How do IT programmers perform their identity as knowledge workers?
2. What does it mean for IT programmers to be *manong*? How does this status relate to their identity as "knowledge workers"?
3. How does the experience of *manong* IT programmers in China confirm or extend the results of existing research on knowledge labour?

4. Methodology

We have employed cultural discourse analysis (CuDA) in this study (Carbaugh 2007). Cultural discourse is conceptualized as "a historical transmitted expressive system of communication practices, of acts, events, and styles, which are composed of specific symbols, symbol forms, norms, and their meanings" (Carbaugh et al. 1997). CuDA is a relatively new approach that helps to explore how sociocultural life is created and maintained by communication and interaction. This method asserts that communication both assumes and constitutes social realities, in which identity, relationships, emotions, actions and dwellings represent particular areas of focus (Carbaugh 2007). Situated within the increasingly connected environment of the digital economy, knowledge workers characterise themselves through the employment of intelligence, innovation and language (Marazzi 2011). Concomitant to their technical expertise is the frequent use of language and communication during job tasks. Marazzi (2011) has noted that information flows and communication practices are an indispensable part of the way knowledge workers express their identities. For cultural analysts, the communicative acts that take place during knowledge workers' quotidian work lives also contain elements that express broader concerns such as who they are, what they believe in and why they behave in a certain manner. In that sense, we believe that knowledge workers' communication practices are effective and efficient facilitators for us to explore their daily relationships and sociocultural preferences.

In this study, we aim to look at the specific culture of computer programmers and the social behaviours inherent to this group on both a personal and professional level. Thus, in our research, culture refers to the sociocultural meaning Chinese programmers have created by being, identifying, relating, and acting as knowledge workers. We argue that the communication practices of programmers actually are the meaning and complexities of being, identifying and acting as knowledge workers. In the analysis of programmers' communication acts, we treat meaning as an imminent, spontaneous part of communication practices.

We have collected data through in-depth, semi-structured interviews with computer programmers as well as through online ethnography. We interviewed 26 employees from 10 small companies in Beijing, Shanghai and Shenzhen. The interlocutors included 6 females and 20 males. Each interview lasted from 60 to 90 minutes. The data was collected in March, May and November 2014, when one of the authors went to Beijing and Shanghai to conduct these studies. The same author also went to Shenzhen three times to talk with the programmers who work there. The interviews started with the researcher telling the interviewee the purpose of the study and providing a promise of confidentiality. The interviewees also provided informed consent. Some important questions like, "Why did you want to be a pro-

grammer?", "Do you think of yourself as *manong*?", or "Tell me one impressive thing about your work", were asked in order to explore the respondent's identity dynamics and the implications of being a *manong* in the Chinese ICT industry. Instead of a strict structure-based interview, a set of open-ended questions concerning the respondent's personal experience, work projects, and daily life in and outside of work were asked. In addition, the interviewer also went to Shenzhen to visit some of the programmers' houses and working places, and commuted to work and back with them.

The authors also used online ethnography as a compensatory method to collect data. Online ethnography is a method used to explore the communities and cultures of computer-mediated interaction. This method understands the Internet as both a culture and context for social interaction (Dominguez et al 2007). Online ethnography is an appropriate method for our study given programmers' occupational and collective characteristics. Research has shown that computer programmers have a higher frequency of Internet use than average. They on average spend 41.5 hours per week in front of a computer at work (CNNIC 2014). Moreover, programmers are apt to spend the majority of their free time surfing the Internet. Consequently the Internet becomes the second home for many programmers in China, as is evidenced by the burgeoning programmer bases on some BBS, online communities, and websites. Baidu BBS (tieba.baidu.com), Zhihu (zhihu.com) and Guokr (guokr.com) are among the online communities that host large numbers of programmers. Compared with some professional online communities like Github (github.com) or Google Code (code.google.com), where open source coding is discussed and code is shared, Baidu, Zhihu and Guokr attract thousands of programmers who communicate not only about technical matters. but also about their daily life and work experiences. Baidu BBS is one of the biggest discussion forums in China. Zhihu and Guokr are among the most popular Q&A network communities. Particular forums entitled "IT workers", "*Manong*" or "IT programmers" are created within these online communities as places where stories, emojis and casual dialogue can be shared between IT workers. The multidimensional conversations that occur there, constitute, as Carbaugh (2007, 174) has indicated, an important cultural discourse about the programmers' "personhood, relationships, actions, emotion, and dwelling". Based on this, we argue that online ethnography is an efficient and useful way to explore how programmers develop, distinguish and maintain their identities.

Communication practices in Q & A conversations and discussion board posts are common formats in Baidu BBS, Zhihu and Guokr Q&A websites. The researchers registered on these online communities in order to collect data through online observation, participation in discussions, and interaction with other members in Q&A format. One of the researchers has already been a member of Baidu, Zhihu and Guokr for more than two years, so we were able to draw on this experience when analysing online communications. The total number of registered participants in these programmer groups can be found in Table 1.

Programmers' Online Communities	Number of Members
Baidu Post Bar	24,854
Zhihu Q & A Community	22,054
Guokr Q & A Community	15,931

Table 1**:** Registered members of relevant websites (Note: Retrieved November 28, 2014. (No. of members refers to the number of people who have registered as a member)

Both the logs of our interviews and the information retrieved using online ethnography occupy the genre of memoir, as these are personal narratives about salient concerns within the subject's lives. These thoughtful reflections serve as testimony through which the researchers can observe the experience of knowledge workers from the perspective of people living within this world. A memoir presents a highly personalized "insider view" (Boylorn 2008, 505) that is redolent of the tapestry of small, everyday details that make up the respondent's social reality. It provides a discourse that, in its original state, is not presumed upon by the researcher's ways of knowing. As Scott (2014, 760) argues: "Memoir writes the personal story, without the theory". It is exactly this academic impartiality and attention to personal significance that makes the memoirs a fertile resource for investigating the identity dynamics of Chinese programmers. All of our data was coded in Chinese and later translated into English when conducting the analysis. During both of these events, the researcher must be mindful not to transmute the respondents' meanings (Maniam 2014). Despite these challenges, memoir provides a suitable lens through which to explore the communication practice of Chinese programmers and the "meta-cultural commentary" (Carbaugh 2007, 168) that accompanies this: the good aspects of programmers' lives, the bad ones, and how life experience varies between individuals.

5. Professionals, Socially Constructed Meritocracy and Identification

Throughout this study, a sense of "technical pride" was frequently expressed by the programmers. One example can be seen in a response by interlocutor A, who recounted the sequence of events, by which he came to work in the IT industry:

> *"When I went to university, I majored in journalism. Then I switched to information technology and learned 'C++' [one of the programming languages]. I feel so lucky to have done that. I just love the computer languages because compared with journalism, you can actually learn a lot more from IT: you get a smarter mind, and a more promising future. I think the IT industry is the brightest one among all the industries in modern China, right? I feel very motivated when I realize I am one of the technicians in our IT industry."*

A's sense of belonging and positive identification as an IT programmer come from the fact that he perceives himself as somebody who possesses in-demand technical skills and works within an avant-garde industry. Wrapped up in this identification are narratives on programming languages such as "C++" and an overt sense of achievement expressed in phrases like "learn a lot more" and "a smarter mind". In A's memoir, he mentions the high standing of the IT industry in modern China and relates this to his own position. Indeed, A is not alone in his choice of phrases and images. While less celebratory than A, Interlocutor B, a software developer who has been working in the industry for 2 years, relates similarly positive statements about the growth of the IT industry both in China and worldwide:

> *"Being a* manong *is not the best vocation, but it is not bad either. At least you can make a living from using a technology you have mastered. Not everybody can say they make a living utilizing a particular skill. I do not mean to offend, but we are the experts on computers and software. The IT industry is taking off, both in China and in the world. My salary is ok, and using your skills, you can have a decent life and promising future."*

Beyond his strong identification with technology use and the rising IT industry, B's narrative highlights social stratification in the class structure. Despite the somewhat perilous position he claims to occupy within the middle class, B seems happy to belong to a social group whose talents are in demand. Moreover, B is pleased to be able to support himself using a particular skill that he has invested time in to learn and master. Thus, both respondents can be seen to indicate a sense of pride in their work as they foreground the acquisition of useful technical skills and the contribution these make to the growing IT industry. Actually, while

relating their experiences working with information technology, both A and B's statements challenge traditional ideas about labour. Talking about their lives as IT professionals, the respondents' strong identification with technology and frequent references to modernity, mask their labour processes and working reality. A similar challenge was also found in the responses of female programmers, who recounted that, while male dominated, the IT industry offers skills, opportunity and, potentially, a burgeoning meritocracy between male and female workers. Interlocutor C, a female Chinese programmer explains:

> *"When I introduce myself, I am proud of being a programmer. I mean, especially when you are a girl. When I meet some new friends and they know I am a computer programmer, and that I can also use 'Java' and '.NET' (two computing languages), they look up to me. In a field where men are dominating, girls are valued."*

In traditional Chinese culture, work is central to male identity. The increased participation of women in the IT industry has brought new dynamics and implications to IT work culture. Mukherjee (2008, 64) indicates a similar process within Indian popular culture where the IT industry portrays an appearance of meritocracy and accessibility: "popular journals are replete with stories about the 'high techlift to middle class Indian women', emphasizing that this industry is ideal for women because it does not involve physical or manual labour but intellectual labour".

Mirroring this process of female IT workers' gaining opportunities through technical skills, C's response indicates that she receives social status because of her knowledge of computer languages. C's achievements do not, however, mean that women as a group are not confronting questions and challenges about their skills and use of technology, especially against the background of the gendered status of technology and computing languages (D'Mello 2006; Mukherjee 2008). For a long time, females were excluded from male-dominated industries such as engineering, IT and science. With the help of education and the breakdown of traditional limitations on female career paths, increasing numbers of women are becoming programmers. Thus C's identification as an IT programmer indicates a socially constructed process, in which gender takes an important role in contextualizing the individual (as an ambitious go-getter) and the overall growth of the IT industries (as supported by new labour demographics such as young female programmers).

Through personal narrative, the individual situates oneself in a particular position, in which personalised sociocultural and political identities form (Witteborn 2008). During our interviews, the respondents' sense of belonging regarding technology was socio-culturally meaningful in constructing their identity as IT programmers. Despite, or perhaps because of, the historically gendered status of technology and computer languages, technical pride is particularly notable in female IT programmers, and it helps to construct a sense of meritocracy among IT programmers. Instead of using terms associated with arduous labour, respondents' work tasks are represented by more "fashionable" associations like the names of computing languages and technology, statements about professionalism, as well as references to the overall growth of the IT industry. The programmers' responses also foregrounded the relationship between the individual and their wider social context. Given the respondents' frequent references to the esteem, in which their job was held, it can be said that Chinese IT programmers see themselves as contributing to the growth and advancement of China as a whole, at the same time as participating in their own self growth.

6. Places, Mobility and Internalised Precarity

A high degree of worker mobility is another salient point that emerged within our data analysis (See: D'Mello and Sahay 2007; Xia 2014). When individuals relate their work experience, they often use expressions such as the following ones: "I have worked in Beijing, and now I am in Shanghai", "I used to work in Shantou, but I went to…", "I worked there for three months, then I went to another company". The vast majority of interviewees had experience

working in multiple companies or cities, while some also took part in projects that operated among different cities, provinces or countries.

If being an IT programmer involves high mobility and liquidity, what then does mobility mean to IT programmers? According to interlocutor D, frequent job-hopping is, "a normal part of being a programmer". He explains the need for job-hopping by addressing his personal development within the context of the fast moving, ever changing IT industry in China. D is an IT programmer who is responsible for developing online transaction systems. He works in Shanghai, but must frequently visit another six cities in order to participate in different projects. The geographically dispersed places he visits form a "migrating map", in which IT programmers are "high tech nomadic workers" (Upadhya and Vasavi 2008, 20). Iedema et al. (2005) indicate that due to the increasing intensity of communication and the high mobility of information, modern management requires knowledge workers to respond and act faster and faster, making their professional life constantly mobile and fluid. Perhaps it is accurate to say that it is these same occupational characteristics that make IT programmers frequently relocate to different physical places. However, the underlying mechanism here is a highly mobile market and capital (see: Xiang 2007). Labour is increasingly tied to this mobile capital but has little control over it. As such, the growth of the networked IT industry in modern China results in the increasing disembodiment of programmers. Acknowledging the social consequences of the information society on the bodies of physical workers, other pertinent questions are brought forward such as how IT programmers identify with the high mobility of their work. And, how do they deal with the precariousness and risk of being an IT programmer?

Another comment on the mobility of IT programmers comes from interlocutor E, who shared her working experience with us:

> *"I graduated from Wuhan and worked in a company for 2 months, then I went to Shanghai. It is a good job, but actually I found anyone else could do the job I was doing—it was not creative at all. I felt futureless. That's the reason I came to Shenzhen… Usually your income will increase 10% or more if you choose to go to another company. What's more, most of us (IT programmers) can have a better opportunity for individual development if we change to another company, right? No one is stupid enough to change companies if the next job is worse. Frequent job-hopping is often the case. The IT industry in China is changing so fast, you have to keep learning new things, and nobody knows what will happen in the future".*

During the interview, the interlocutor cited a number of different cities, in which she had lived in combination with phrases like, "better opportunity", "changing so fast", or "keep learning new things". Within her memoir, personal development is an important element that she balances with potential risks. In that sense, the insecure and precarious traits IT work holds are subsumed into the "discourse of achievement", in which all risks become integral parts of an individual's success. As such, the unstable job security of her work has been internalised as a natural and normal phenomenon. In the memoir above, we can also view the previously mentioned narrative type, in which the respondent relates her personal development to the context of wider society. This narrative sequence, combining individual development and outer risks, informs the specific dynamics of how IT programmers identify their mobility and job security.

In regards to our first research question about the ways, in which IT workers distinguish and maintain their identity as knowledge workers, we may conclude that IT programmers manifest themselves as knowledge workers through their identification with professionalism, technology, meritocracy, mobility, and precarity. They frequently address technical skills and the mastery of programming languages. Coding skills are seen as an integral part of being an IT programmer. Programmers also take their highly mobile, precarious work conditions as normal, regarding these circumstances as a natural part of how IT works. Here, individual development is seen as an important motivating factor for the internalisation of the precarity involved with frequent physical mobility.

7. Deskilling and Panoptic Control

Much scholarly attention has been given to the new "creative class" that post-industrial information society has brought about. Within this domain, IT industry workers are given labels such as "professionals", "programming scientists" or "technicians" and are commonly pictured as performing highly skilled tasks (See: Janz et al. 1997; Florida 2002; Shirky 2010). However, we found that much of the work performed by our respondents, especially IT programmers in small companies or in the initial stages of their career, is highly mechanical and unskilled. One example is from interlocutor F. F had only recently graduated from a technical training school called Bei Da Qing Niao, and found a job in Guangzhou.

> *"It is the lowest of the low to become a programmer. What you need is to find a training institution and learn one or two years hard. You get skills that companies need, then you work for them. They do not care about your programming languages or your quality or anything else. What they want is that you do the work as quick as you can. That's why we call ourselves "*manong*". We are like construction workers, and the difference is that they deal with bricks, we deal with code. Both are boring, repetitive work."*

In Chinese, *manong* can be translated as "code farmer" or "code monkey". In stark contrast with celebratory rhetoric about the new "creative class" and the imagined prestige of virtual labour, what interlocutor F emphasises is that being an IT programmer is no more than a grapple with survival. F employs descriptions such as "repetitive" and "lowest of the low" and the metaphor "construction workers" in order to highlight what he perceives as the bleak reality of programming. F also goes as far as to explode beliefs in technical prowess or work quality as are espoused in positivist views of knowledge workers or the 'creative class'. Another example which further illustrates the deskilled working context of programmers can be seen on the Baidu BBS. Within this platform, there is a discussion group especially for IT programmers called "Programmers' Bar" with communication here taking the form of a Q&A:

> *"Question: It seems that computer programmers suffer from poor working conditions, but I can do nothing except writing codes, what should I do?"*
>
> *"Answer 1: There is a famous saying, "easy come, easy go". So it is with us computer programmers. We are like disposable chopsticks, becoming useless as soon as the company stops employing you. You undertake a four-month training, and you become a computer programmer. Then they (the companies) bleed you dry. You are absolutely like rubbish. Such is the life of being a* manong*."*
>
> *"Answer 2: Tell me about it. Computer programming is for young people only. You work for several years then it is all downhill. This is the law. You have to keep learning new things. […] I know a friend who develops C# (a computer language). He works from 9:00 a.m. to 10:00 p.m., and sometimes he works till dawn. He eats, works and lives in the company, 3000 RMB per month (Approx. $500 US). His hair is falling out badly."*
> *……*
>
> *"Answer 5: Think about why you want to become a* manong*. For money? For enjoyment? If it is so, then you should definitely change your job. […] Look at China, it is such a big country, but we even don't have our own Spring Frames (a kind of simplified programming language framework), let alone languages, data and operating systems. Our society is too impetuous."*

The answers above show the plight of being a computer programmer in China. The programmer's life is characterised by hard work, long hours, low pay and poor job security. Our interview material evidences this circumstance by the use of metaphors such as "disposable chopsticks" and "bleed you dry". As McKercher and Mosco (2008) have indicated, there is a

process of deskilling among many knowledge workers in the digital economy. Though they are called "knowledge workers", much of the work of our respondents is monotonous and repetitive. In recent years, one of the characteristics of the burgeoning IT industry is outsourcing. Outsourcing occurs when a big company sends parts of their non-core but labour-intensive business to small external corporations in order to reduce their production costs. In the highly competitive Chinese economy and IT industry, taking on outsourced work has become an important means of livelihood. Usually this kind of work is low-paid and time-consuming. However, both big and small companies are benefiting from reducing the skill components of IT programmers.

In couplet with these narratives of deskilling is the overall scenario of hyper-pressure and highly exploitative working conditions that the programmers face in and that appears entrenched within the IT industry. IT companies develop both "hard" and "soft" management strategies to control their workers. IT programmers are usually asked to finish the project as soon as they can, and once they get involved with a project, intensive communication is conducted between them and their module leader, project leader, and project manager. Interlocutor G explains:

> *Every afternoon, we have a corporate meeting. We are asked to report on the work we have done that day to the module leader. Then he will report it to the project leader. The manager will not intervene with our work directly, but he has a good idea of what you are doing and what you have finished, and of course, not finished. But actually it is not as strict as you imagine. The managers often invite us for dinner, and we are also offered drinks and snacks during the break. […] We have a fingerprint checking system, and if you are late, it will deduct 50 yuan (Approx. $8 US) from your salary. But most of the time, the money we have been deducted is used for our project dinners or parties*.

G is not alone in having such work experiences. In most companies, IT workers are expected to perform as individualised, self-managed employees while at the same time, "they must perform within a tightly controlled and impersonal management system that traces their every move and moment" (Mukherjee 2008, 65). In the interlocutor's response, this rigorous, Taylorized control is achieved by management strategies evidenced by phrases such as everyday "reports" to the "manager", "fingerprint checking system", salary reduction "if you are late". Such Taylorist control presents itself as humane and tries to hide its exploitative nature by employing "dinners and parties" as the reward to its employees. IT companies like to create a "lively, friendly, and harmonious" (Upadhya and Vasavi 2008, 31) environment, and they give their workers material incentives to stimulate their activity. Under these conditions, a "panoptic" environment is formed, in which managers totally control workers (Bentham 1791; Foucault 1977). While on the one hand, employees are subject to the high pressure of their work, we find the gaze of their supervisors and constant progress checks on the other hand. They feel attracted by their workplace and the social engagement and camaraderie it offers. Within such a space, the boundaries between work time and spare time, labour and play, become fuzzy (Fuchs 2014). That workers should have fun and, as such, enjoy (or at least accept) the repressive controls emplaced upon them, has become a new ideological strategy of capital. In such conditions, the "panopticon" becomes the IT workers' "internal gaze of self" (Upadhya and Vasavi 2008, 30). This internal gaze leads to the term *manong* as the most appropriate one to address their selfhood as labour 2.0. Not only do they work under tough conditions, but in the digital work site surveillance and progress monitoring are nearly always present.

8. *Manong* as *Diaosi*: A Challenge to Hegemony

Identity issues connected to *diaosi* ("屌丝" in Chinese) are popular among computer programmers. *Diaosi* in Chinese is a self-deprecatory term that refers to people, especially

males who are part of the lower class and suffer from poor working conditions. This term gained its popularity on the Internet in 2011. Now, it has become a catchword amongst the salariat and blue-collar workers. IT programmers are among the different social groups that refer to themselves as *diaosi*. For example, interlocutor H said in Baidu BBS：

> *"I was born in 1985. I took the National College Entrance Examination three times, so I am two years older than my classmates. I didn't find a job after I graduated from college, instead I lived off my parents. One year later, I became a computer programmer. I have been working for two years, and now I earn 3,000 RMB (Approx. $500 US) per month. I feel futureless and unmotivated […] I'm almost 30 years old and I have no girlfriend. I have nothing. Now I am exactly a* diaosi*."*

H's memoirs focus explicitly on the poor working conditions he is confronted with. He identifies himself as *diaosi* by stressing that he is old, poor, and hopeless. In this situation, being an IT programmer doesn't ameliorate his poverty. H is not alone in identifying himself as *diaosi*. Another example can be found in a Zhihu Q&A community entitled "*Diaosi* IT Programmers":

> *"Question: I am a* diaosi *code monkey, and my monthly income is less than 10,000 (RMB). My girlfriend wants us to get married before she turns 30, but I have no money to do this, let alone to buy a house or a car. What can I do?"*
>
> *"Answer: Let me first introduce myself as well. I am from Shijiazhuang, and I am an IC computer programmer. I graduated from a low-level college and I got a Master's degree at a 211 university [...] My family is poor, and my parents are old, I have no car, no house. I am a* diaosi*, too. I was despised when hunting for a job. I cannot find a chance in Shijiazhuang, but I also cannot leave my parents alone. Coding is boring and arduous, and I make little money. I am killing myself."*

In this Q&A exchange, *diaosi* is related to low income, high pressure and confusion – all elements that cause computer programmers suffering. As such, it is interesting to find that many IT programmers willingly identify themselves as *diaosi*, and that even some female IT programmers call themselves "female *diaosi*". *Diaosi* has become a shared, collective symbol among the *manong* and a variety of emoji, comics, and memes have been created in order to give expression to this term and its shared signification. Upadhya and Vasavi (2008) indicate that Indian software engineers show "a central feature of individualization" (24) and lack a collective identity as workers or employees. However, we argue here, the expressions of *manong* and *diaosi* in modern China can be regarded as a collective identity. The highly precarious, mobile, deskilled working conditions endured by IT programmers, create a sense of liquidity, uncertainty and anxiety. The term *manong* captures this labour. From this point, the catchword "*diaosi"* has developed as a means to seek self-expression and self-awareness. While the usage of the term *manong* is almost literal in meaning, *diaosi's* signification is figurative and as such lowlier, sharper, and more alarming. Li and Li (2013) have indicated that *diaosi* culture is recreational and ironic, but it is also collective and critical. In this way, IT programmers use *diaosi* as a shared expression to challenge the inequality, precarity and alienation inherent in their position as knowledge workers.

Regarding the second research question, the identity of *manong* is enacted alongside expressions describing hyper-pressure, deskilling as well as attempts at resistance. Lazzarato (1996) notes that one of the primary characteristics of knowledge workers in modern management is the integration of work and subjectivity. Within that mechanism, institutional control over labour expands from work completion to subjectivity construction that includes activities traditionally outside of the work sphere such as communication skills, creativity and knowledge. Through the memoirs of the respondents, we can see that Chinese IT programmers have experienced a process of alienation: They are engaged for long hours in repetitive work, and the borderline between working time and personal time has been made indistinct

by corporate strategy. While knowledge labour occurs within the discourse of the 'creative' informational economy, only a minority of the programmers surveyed by this study situate themselves in this discourse by praising their work tasks and opportunities within the IT industry. Most identified more readily with the term *manong*. *Manong* thus encapsulates Chinese programmers' difficult position, working hard on repetitive tasks under fast paced, highly monitored conditions. The term's direct reference to physical labour (i.e. farming) frames the idea that programmers think of their role in the immaterial economy as more closely related to menial, low level tasks than the rarefied, technical tasks supposed of those who work on computers. In this context, the *manong's* status as "knowledge" workers becomes an ironic insult, with the term *diaosi* used as a rallying point through which IT programmers vent their frustrations.

9. Discussion and Implications

Drawing on the concept of knowledge workers, this study explores the identity dynamics of *manong* in China. In conclusion, four themes concerning being an IT programmer have emerged from the empirical analysis. Table 1 shows an overview of the themes:

IT worker-related theme	Characteristics	Links to identity
Knowledge workers & technology	Professionalism, meritocrat, identification	A sense of "technical pride" is constructed through expertise in computing languages and gendered skills. Discourse on the rapid growth of the IT industries contributes to this identification. Knowledge workers perceive themselves as a meritocracy.
Knowledge workers & liquidity	Places, mobility, and internalized precarity	Mobility and frequent job-hopping are "a normal part of being a programmer". They are requirements for better development and chances. Workers internalise the risk via a strong motivation to succeed.
Knowledge workers as *manong*	Deskilling and panoptic control	Much of their work is mechanical and unskilled. Being a *manong* is a process of deskilling, hyperpressure and alienation. The "lively, friendly, and harmonious" facade of the workplace creates panoptic control of IT workers.
Knowledge workers and *Diaosi* discourse	*Diaosi* discourse: a challenge of hegemony	*Diaosi* discourse is constructed by low income, poor capability, and uninspiring possibilities for future advancement. It is a collective expression that seeks self-expression and self-awareness.

Table 2: IT worker-related themes, characteristics, and links to identity dynamics

Some characteristics of knowledge workers identified in this study correspond to Virno and Hardt's concept of "less materialized" commodities, which are defined by their "cultural, informational or knowledgeable components" (Virno and Hardt 1996, 262). However, the identification as *manong* and *diaosi* amongst programmers addresses less "cultural, informational, knowledgeable" causes than physical, repetitive, and deskilling work that low level Chinese programmers have confronted in their work practices. Though Hardt and Negri (1994) insist that knowledge workers are not only a "select cadre of technical workers", but also "a massified quantity of cyborgs and labouring intelligentsia" (280), in our analysis, it would be a limitation to prioritise intelligence over manual work or vice versa. To echo the holistic conception of knowledge workers discussed in the introduction to this paper, our analysis considers knowledge workers' identity as composed of both digital and physical dimensions.

Our third research question focuses on how the experience of programmers in China confirms or extends the existing studies of knowledge labour. Besides supporting a more comprehensive definition of "knowledge workers" as championed by recent scholarship, our

analysis of programmers' personal memoirs also interrogates the issues of survival, struggle and plight (See also: Fuchs 2014; Sandoval 2013). As Lazzarato (1996) has indicated, the working characteristics and arrangements that exist within the information society make it possible for new power relations to arise. As one of the social groups whose discursive power is marginalised within mainstream media, IT workers enact the *manong* and *diaosi* identities as an outlet for self-expression and a site for resistance.

According to Dong and Huang (2013), *manong* and *diaosi* are rallying calls in modern China and through these collective expressions, it is possible for knowledge workers to call attention to and challenge the highly exploitative components of their digitalised working processes. However, it remains to be seen as to whether these mainstream discourses can create a "genuine autonomous communication network" (McKercher and Mosco 2008, xxi) through which to challenge hegemonic structures and achieve meaningful and lasting changes within the (Chinese) IT industry.

Four themes concerning identification emerge from our cultural discourse analysis. They are: 1) technology and meritocracy 2) high mobility and precarity 3) identification as *manong*, and 4) *diaosi* discourse. The discourse of being an IT programmer is not a unitary one. It is interesting to find that the identity dynamics of IT workers in China are somewhat contradictory. On the one hand, new chances and expectations can be found by IT workers (such as their identification with technology, technical skills, and the advancement of the industry as a whole; as well as programmers' optimism toward mobility and precarity), while on the other, a process of reaffirmation of the traditional labouring process also takes place (seen in the complaints about deskilled, repetitive work, a perceived lack of promotion opportunities, and *manong* and *diaosi* expressions). In this context, the complexity of IT work culture becomes evident.

While parts of the *manongs'* working experience, such as liquid working conditions, overwork, and even the similarity of the "*manong*" and "code monkey" labels, form a common thread between extant profiles of software engineers in China and the West, there are several salient differences between the programmers featured in this study and their Western counterparts. Drawing on the example of programmers working at Google, Fuchs (2014) has described programmers in the West as a "labour aristocracy of highly paid, highly stressed workers" (264). *Manong* working in laborious and highly monitored conditions are likely to feel the same (if not more) stress, however, without the compensatory benefits of high pay, and, to some degree, high status. A salient point here is that small Chinese software companies exist at the base of the capital pyramid, situated at the farthest point from the end profits. While China's software products are mainly for the domestic market, the cycle of production is affected by international capital and globalisation. Working in small companies performing outsourced tasks for bigger companies, the value created by Chinese software engineers is reaped by either foreign capital or domestic Chinese capital. The code farmers' existence can then be seen as necessary to support the creation of surplus value for both Chinese and transnational companies, through unfair, highly exploitative labour that is integrated into the transnational production chain of large companies.

Finally, we need to ask: How can we make sense of these four themes of worker identity emerging from the respondents' narratives? What McKercher and Mosco (2008, xiv) have suggested is that the issues knowledge workers are confronting should be positioned into "the wider social totality of interconnected political, economic, social and cultural forces". Because the IT industries have established an exclusive, socially constructed discourse that focuses on economic development, innovation and knowledge (Fuchs 2014; Xiang 2007), this same ideological discourse meanwhile obscures the disenfranchisement, alienation and exploitation experienced by some IT workers. The fact that *manong* are at the lowest point of the hierarchy of software production means they gain little attention in overall discussions of IT and technology and can thus be easily overlooked by companies in favour of economic factors (Sandoval 2013). The highly individualised working conditions common to the IT industry further exacerbate feelings of alienation felt by *manong*. Beck and Beck-Gernsheim (2002) have noted that the increased institutionalisation and standardisation in modern companies enhances individualisation. According to Upadhya and Vasavi (2006), IT program-

mers display such a pronounced sense of individualisation due to the lack of collective identity and the institutionalised working processes present in the IT industry. Most of the time, programmers have to make important decisions on their own in order to complete their work and projects within deadlines. Moreover, the specialisation inherent to IT companies constrains programmers within a limited set of professional skills, while prying into others' work conditions or salary is regarded as unprofessional and inappropriate.

People's communication practices can be shaped by their environment and vice versa. To some extent, IT workers' identification with technology, mobility, *manong* and *diaosi* is constructed through their communication practices. But these discourses also reflect the programmer's social reality. We argue that the four emerging themes identified of computer programmers do not occur independently but are rather integrated into: 1) the dominant ideological discourse that focuses on economic development and technology worship; and 2) the process of individualisation among IT programmers.

This does not mean that the four themes identified in this study are comprehensive in explaining the identity dynamics of IT programmers. Knowledge workers in the digital economy support a diverse range of meanings. This paper represents only one exploratory study of IT workers' identity in China. Broader issues like gender, class and hierarchy will continue to provide new insights for further research on knowledge workers with questions like: What do IT workers, as knowledge workers, mean to China? How do the "*manong*" and "code monkey" labels compare to one another? How can knowledge workers gain control of their subjectivity and connect with other international bodies of knowledge labour? Finding answers provides fertile ground for future research.

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Petros Petridis / Elias Stouraitis / Manolis Patiniotis

MANY TIMES: THE PERCEPTION OF TEMPORALITY IN DIGITAL ENVIRONMENTS

Volume 5, Issue 1/2

Many times: The perception of temporality in digital environments

Petros Petridis, Elias Stouraitis, Manolis Patiniotis

Keywords: time, social media, video games, anthropology, digital ethnography

Recommended Citation: Petridis, P., Stouraitis, E. and Patiniotis, M. (2022). 'Many times: The perception of temporality in digital environments', *entanglements*, 5(1/2): 35-49

Many times: The perception of temporality in digital environments

Petros Petridis, Elias Stouraitis, Manolis Patiniotis

Abstract

The notion of space has always been in the center of studies aiming to explore the nature of digital environments. Especially regarding videogames, the immersion of users in virtual spaces has attracted great theoretical interest. Time, on the other side, has been greatly neglected in digital studies. Although, according to Boellstorff, the relation between spatiality and temporality is co-constitutive, so far we know very little about the ways extremely popular technologies, like social media and digital games, contribute to the transformation of both the perception of temporality and the understanding of past and present. The aim of this paper is to examine how the systematic exposure of high school students to digital environments affects their time perception. The research upon which the paper is based was mainly conducted through semi-structured questionnaires, workshops and participant observation in digital games and social media. The main aim of the research was to find out the transformations in the perception of temporality and how they vary according to the differential exposure of the individuals to particular digital environments (games, social media, educational use). At the same time, it examines whether the members of the group developed particular skills or collective mechanisms to evaluate, organize and manage the flows of nonhierarchical information they engage with. Finally, it tries to investigate the ideas of the individuals about duration, past and present, memory and the irreversibility of history.

Introduction

The work presented here is the culmination of a research project that aimed to examine how systematic exposure to digital environments affects high school students' perception of time. Drawing on the theoretical concepts and methodological tools of digital (and) multimodal anthropology, the research explores how students involved with specific digital media—such as social media (Instagram, TikTok, YouTube etc.) and video games (World of Warcraft, Call of Duty, Assassins' Creed, Fortnite, WWII Online, Grepolis etc.)—as well as with various narrative forms associated with these media (images, videos, sounds, texts, algorithms) make sense of time and shape their temporal experience. In the course of our presentation, we use "digital environments" as an inclusive term denoting a wide variety of societal contexts mediated by online communication. Instead of focusing on "virtual worlds" that would confine our investigation to digitally persistent contexts (Boellstorff et al., 2012, p. 7-8), we preferred to make use of a framework that would enable us to capture "the mutual permeation of the virtual with the physical world" (Frömming et al., 2017, p. 13), as befits the object of our research. It is important to stress that the particular character of digital environments, in combination with the special conditions of COVID-19 pandemic, had a significant impact on the way we employed the tools of multimodal anthropology to produce ethnographic and historical knowledge.

The notion of space has always been at the centre of studies aiming to explore the nature of digital environments. Pierre Levy's virtuality has been closely associated with ubiquity (Levy, 1998, p. 38-39). According to Paul Virilio (2000), the diffusion of information technologies resulted in the end of geography. At the same time, geographical metaphors have been widely used to convey the experience of individuals involved with digital media. The construction of digital spaces ("placemaking") is a condition of possibility for the creation of virtual worlds and digital game

environments (Boellstorff, 2008, p. 91). Finally, the disengagement of virtual communities from the "natural" space brought about the emergence of cyberspace as the habitat of the so-called digital natives. All these theoretical undertakings and conceptual shifts underscore the centrality of the concept of space in digital environments. Especially regarding videogames, the immersion of users in virtual spaces has attracted great theoretical interest. For Janet Murray (2016 [1997], p. 79-82), spatiality is a crucial feature of procedural media, whereas for anthropologists Boellstorff and Nardi, game designer Pearce, and sociologist Taylor (Boellstorff et al., 2012, p. 7), virtual worlds and online games are not mere simulations but spaces wherein players can move and interact.

Time, on the other hand, has not attracted as much attention. Huyssen, writing in the beginning of the millennium, assumed that time had been greatly neglected in digital environment studies (Huyssen, 2000, p. 21-22). Although the relation between spatiality and temporality is co-constitutive (Boellstorff, 2008, p. 102), there is not much research about the ways various popular technologies, like social media and digital games, contribute to the transformation of both the perception of temporality and the understanding of past and present. True that time has long been the subject of anthropological research (Levi-Strauss, 1952; Fabian, 1983; Gell, 2001). However, although in the last fifteen years a number of ethnographies have focused on the notion of time in relation to digital media such as virtual worlds (Boellstorff, 2008), database memory and digital mourning (Ryan, 2012; Papailias, 2016), the respective literature remains rather limited. A recent contribution of particular interest to our research is Rebecca Coleman's work on the ways social media transform users' perception of the present (Coleman, 2020a; 2020b).

The notion of historical past also poses significant theoretical challenges. Prior to the digital era, the sources considered appropriate for providing historical information beyond school education were limited. Radio broadcasts, TV shows, children's books and especially the narratives of the adults (for children who could afford such luxuries) provided a general frame for time and history. Today, the available extra-school sources of information are multifarious, especially in technologically advanced societies where children have easy access to digital media. In this new context, historical data and especially their interpretations do not draw exclusively (or even primarily) on the recognized authority of the adults, thus leaving space for heterogeneous creative reconstructions of the past, which blur the boundary between reality and imagination. On top of this, the involvement of individuals with digital media brings into play interaction and performativity that radically alter the experience of temporality.

The aim of this paper is to contribute to the discussion about the ways in which the digital transition affects the perception of temporality. The paper is based upon research that focuses on how time is experienced by individuals who are systematically exposed to digital environments, which are defined as "conglomeration[s] of technologies, events and realities that interpenetrate each other, sometimes co-constitute each other, [thus leading] to changed ways of being" (Frömming et al., 2017, p. 13). Hence, the object of our research was neither the experience of "digital" time per se, nor the experience of "natural" time as opposed to the artificial temporalities of the virtual worlds, but time as a general condition of existence, and the ways digital environments alter its perception. The project took place in Greece between the spring of 2020 and late winter of 2021, meaning that it coincided with the first and second surges of the pandemic. The full name of the project is "Diachronies: The perception of temporality in digital environments" and it was funded by the Operational Program "Development of Human Resources, Education and Lifelong Learning" (National Strategic Reference Framework 2014-2020). It was hosted by the National and Kapodistrian University of Athens, and the research group consisted of an anthropologist, a historian and a historian of science. It goes without saying that, beyond its obvious ethnographic significance, the collection and evaluation of empirical data concerning the transformations of time perception is of crucial importance for education, too: "Why read about Ancient Rome when I can build it [in Minecraft]?" was the rhetorical question asked by an elementary school student at a Game Developer's Conference (Moulder, 2004, as cited by Squire, 2006, p. 19).

The particular aim of the project was to understand transformations in the perception of temporality and how they varied according to the differential exposure of individuals to particular digital media (games and social media). At the same time, it examined whether the members of the group developed particular skills or collective mechanisms to evaluate, organize, and manage the flows of nonhierarchical information they engaged with. Finally, it tried to investigate individuals' ideas about duration, past and present, memory, and the irreversibility of history.

"Why read about Ancient Rome when I can build it?"

Methodology

The research was mainly conducted through semi-structured questionnaires and participant observation. Twenty-seven high school students, aged between 13 and 16, were interviewed, most of them from schools in Athens and Thessaloniki. The gender distribution was 16 boys and 11 girls. Participant observation was conducted both on social media (mostly Instagram and TikTok) and in gaming sessions (World of Warcraft, World War II Online, Grepolis). Group semi-structured interviews in the form of workshops were also employed as an additional method. This method proved particularly fruitful as it offered us the chance to explore the heterogeneous and, at times, conflicting accounts, attitudes, and rhetorics that emerged from the interaction of the students. Six such workshops were organized with students from various schools in Athens and one in Kozani, a city in Northern Greece. Some of the participants had been individually interviewed before the meeting and, in a few cases, soon after it—but no significant difference was observed in the answers of the various groups (non-interviewed, interviewed before and interviewed after the workshop). All students that participated in the research were middle-class kids with regular access to digital media. They were equally distributed between state and private schools, but the distribution is of no particular importance since both schools follow the same curriculum in history teaching. The main features of this curriculum are ethnocentrism (Greece has been the cradle of civilization throughout the centuries) and historical continuation (Hellenism is a nation/national identity that travels across time taking various shapes, but keeping its core values unaltered) (Φραγκουδάκη & Δραγώνα, 1997; Ανδρέου, 2002; Κουλούρη, 2002).

Before the creation of the semi-structured questionnaires, the researchers reviewed literature, paying special attention to works that recorded the personal experience of users who performed in digital environments, as well as the notion of history and the past associated with such environments. The questionnaire was used both in the case of personal interviews and in the workshops, although in the latter case more loosely. The questionnaire was divided into three parts.

The first part focused on the relationship of the interviewees with digital media (the types of media employed for communication and leisure, and daily time spent in each of them); the next part on the firsthand user-experience they enjoyed in particular digital environments; and the third part on the sense of historical time they developed during their digital activities. The questions were designed in such a way that students would not feel interrogated about time. They were mostly directed to think about the social relations they developed whilst active in digital environments and the techniques they employed to handle them both on a personal and collective level.
Due to Covid-19 restrictions, most of the interviews and all workshops were conducted on videoconferencing platforms, like Zoom, Skype and Webex. It is clear that, generally speaking, research was affected by the pandemic and the respective restriction policies. However, the consequences of this special condition were not detrimental—one might even assume that they were beneficial. On the one hand, participant observation was already planned to take place on social media platforms and in digital games, so social distancing didn't impact this aspect of the research. On the other hand, it seems that interpersonal interaction through videoconferencing platforms did not significantly affect the performativity of the participants since, as Nik Yee et al. note, "social interactions in online virtual environments […] are governed by the same social norms as social interactions in the physical world" (Yee et. al, 2007).
At the same time, the fact that a number of participants conceded to be video-recorded during the interviews allowed us to create a digital archive that, beyond verbal communication, also included records of non-verbal expressions, pauses, improvised answers and a wide range of communication signs. As a result, the limitations of the pandemic actually encouraged the creation of a multimodal and polysemiotic repository that captured fieldwork in the making. Varvantakis and Nolas (2019), drawing on Sarah Pink's work, assume that ethnographic analysis entails a time-travel that enables researchers to re-visit the field through memory and imagination. From this perspective, the digital archive we created constitutes an integrated body of evidence that makes this time-travel possible, through the re-enactment of the past rather than through recollection and verbal reconstruction.

Visual repository: Screenshot from a Zoom interview. Notably, the two students use a smartphone to log on to the platform. Courtesy of Eleftheria Salapata.

Beyond methodology, however, it is important to stress that pandemic restrictions dramatically affected the everyday practices of the students by further intensifying their already intense relationship with digital media. Home confinement and distance learning made computers and smartphones the dominant means of communication with the external world. Thus, we should keep in mind that research findings concerning the perception of time have been heavily affected by this particular condition. But, again, there is a positive aspect here. The naturalization of digital media and computational processes—the so called "post-digital condition" (Fielitz and Thurston, 2019, p. 11)—has been heavily questioned by the fact that it is being experienced as a restriction rather than as an emancipation from the limitations of the natural space and time. Pandemic circumstances created the conditions for a global social experiment concerning the relationship of people with digital environments. Thus, for an unfortunate but precious moment, the process of digital transformation became transparent and could be clearly accounted for.

Variations of temporality

The ways students experienced time in digital environments varied significantly. This variation results, on the one hand, from the diversification of digital media and, on the other, from the different ways users get involved with them. As we shall see, the mechanics of each game or social media platform, the form of sociability it encourages, and its general corporate policy radically affect the modes of user involvement. The students mostly played single-player games (Total War, Assassins' Creed), massively multiplayer online role-playing games (World of Warcraft), first person shooter multiplayer games (Call of Duty, Battlefield) and multiplayer online games that aim at personal distinction (Fortnite). One important difference stressed by the majority of interviewees with gaming experience is that in multiplayer games, it is difficult to fully immerse into the gaming environment because the need for cooperation constantly keeps team members in a distinct spatiotemporal framework (neither game's nor room's time). On the contrary, in single-player games full immersion and attachment to the narrative is much easier.

Political economies of attention vary accordingly. Games like League of Legends require constant presence and communication among the players, either during the gameplay or during training sessions aiming to promote the efficiency and coordination of the team. In strategy or life simulation games, like Ikariam and The Sims, respectively, the distribution of attention is different. Such games require consecutive log-ins for the player to adjust particular parameters and direct the development of the story. It is clear that the sense of temporality associated with each category is different. In the former case, the players need to withdraw from their conventional context and, although they do not experience full immersion into the game's environment, switch to a distinct spatiotemporal context shared with the other team members. In the latter case, game time does not form a separate context, but gets intertwined with players' conventional time. Most interestingly, game timescale in this case is usually significantly different from players' timescale, which means that decades or even centuries are intertwined with minutes or hours, producing a hybrid experience of temporality.

Similar taxonomies apply to social media platforms, but in this context time is mostly incremental. Even on platforms such as TikTok, where immersion is strongly encouraged, time is not continuous but consists of discrete time "clips". In theory, at the end of each micro-session, users may log off and reconnect later; the fact that they don't is related to the techniques employed by the platform to maintain users' attention. A 16-year old student brought forth TikTok as a successful example of attention economy management (without mentioning the term): the sequence of short videos activated through a simple scroll effectively keeps users connected with the platform and distracts them from their immediate environment.

It is important that the students who participated in the research were aware of all these differentiations. Indeed, the differentiation between the continuous game time and the incremental social media time came up during the first workshop, and was subsequently shaped through the exchange of experiences among the participants.

Guilty pleasures

Another important finding of the research concerns the feeling of guilt associated with the time spent in digital media. danah boyd has stressed the fact that American media persistently display the relationship of teenagers with social media in terms of addiction—an assumption deriving from a covert technological determinism. As a result, the use of social media by young people is often associated with pathological conditions, as a situation that lies beyond their ability to control (boyd, 2014, p. 78-79). However, in our research, students expressed a more nuanced attitude. On the one hand, they seemed to share their parents' concern about their involvement with digital activities, but, on the other, they seemed confident that they were able to control the time they spent in games and on social media (cf. Liam Berriman's and Rachel Thomson's [2015] account about the ways teenagers get actively involved in negotiating privacy and digital rights in social media environments). This became particularly evident in the case of older students. The preparation for

the national admission exams marks a crucial turn in their lives. When high school students start preparing for the great ordeal (that every year seriously affects around 100,000 Greek families), they also start to evaluate time in a different way. Thus, time spent in digital media is considered less important than time devoted to study. During the first workshop, but also in some interviews, we had the chance to realize that this is a central concern for older students: “In our age, we cannot spend time in gaming as we did while in primary school”; “we are grownups and set limits in the time we spend in digital games”; “doing our lessons is a priority as compared to play”. However, nobody stated that they intended to terminate the use of digital media, as was the case with one of boyd’s interlocutors (p. 77-78).

Obviously, the feeling of guilt is linked with cultural classifications, according to which social media and games are considered a waste of time, while other activities such as reading, exercise, or hanging out with friends are considered “constructive” (Παπαηλία & Πετρίδης, 2015). Along this line, interviews revealed a finer differentiation that does not relate to the concern about national admission exams: time spent in gaming is associated with guilt more often and to a greater extent than time spent on social media platforms. This is particularly the case for teenagers who have established a “professional” profile on social media (the so-called influencers), who tend to be more at home with their practice as they feel they are doing something useful. It should be noted, however, that the pandemic has caused a widespread sense of frustration: “We spent all our time in front of a screen; it’s not the best we can do, we need to escape”.

Leisure, Labor, Learning

It is a truism that, in the era of Web 2.0, content is primarily produced by the users, who continuously generate data and metadata, value and knowledge for themselves and the platform owners. However, users of digital media tend to reproduce the mainstream narrative about the “waste of time”, overlooking the fact that gaming and social media often involve productive practices. “Influencers” seem to be more aware of this dimension of digital practices and this is apparently why they are less prone to guilt.

In 2008, professor of digital culture Scott Rettberg assumed that World of Warcraft players perceive their gaming experience primarily as labor and not as recreation which, from a Weberian perspective, legitimizes the time spent in the game. Legitimization may also come from the fact that particular achievements are associated with “hard work” and “commitment”, which count as positive values (Nardi, 2009, p. 99, 102). In our case, however, it seems that such a legitimization does not work. Things have significantly changed since 2008, of course. Today it is clear that MMORPGs (Massively Multiplayer Online Role-Playing Games**)** like World of Warcraft are quite demanding in terms of time and dedication and this is a matter of concern for high school students. Most of them admitted that they or their parents set limits on the time they spend gaming or on social media platforms. Although at younger ages they would log in every day, as school life becomes more and more demanding, they tend to cut down the time spent in digital environments.

On the other hand, however, the fact that digital games are extensively used for educational purposes, either as supportive media or through the gamification of the educational process, leads to new cultural valuations, which classify some uses of digital games as constructive and others as counterproductive. This change is clearly reflected in the fact that COVID-19 quarantine has largely removed the guilt associated with the use of digital media. The realization that digital games and social media significantly contributed to communication, education, and socializing during the harsh times of social distancing affected the criteria of the distinction between productive and counterproductive time. Along the same lines, the ban of physical contact redefined the notion of “live”, assigning digital media a crucial role in retaining social cohesion. In all those cases, though, the use of social media is more straightforward than gaming: “I spend more time in social media because I follow the news” (girl 16); “generally, I don’t spend much time, but I prefer social media to games, because I get more and more diversified information” (boy 15); “time [in social media]

passes without noticing" (girl 16); "I mostly watch the news on social media; if I feel that this affects me negatively, I'll change it" (girl 15).
It is important, though, that many students also stressed the cultural and educational importance of games. They stated that they learnt and keep learning important things that they didn't have the chance to learn at school or through other educational activities. For some of them (roughly one third of the participants), the gaming experience played a crucial role in motivating them to explore particular historical periods or events, like medieval history, 19th-century American history, or the Second World War. This does not mean that they perceive historical games as knowledge resources. Quite the opposite; the very fact that they came in touch with knowledge that seemed unreliable motivated them to seek further historical evidence, primarily on the Internet (Wikipedia) and, to a lesser degree, from parents and teachers. Maybe it should be stressed at this point that fact-checking tends to acquire a self-referential character in this context. The precision of historical representations is no longer verified by means of "external" academic resources but through the comparison of gameplay (and social media feeds) with information that can be found on other sites on the Internet ("when I get something in social media, I double check it on the Internet"). Thus, everything takes place in the virtual multiverse, but with a clear distinction among different modes of practice. While sense-making emerges from the entanglement of different audiovisual resources provided by the media platforms, fact-checking is performed by navigating through hypertexts acknowledged as valid knowledge resources.
Another important aspect of this process is the possibility of substantiating alternative historical scenarios by means of "modifications". Particular "mods" enable players to alter a game's historical context and allow, for example, for the victory of Axes Forces in Second World War or the prevalence of the USSR in the Cold War, or even for wiping out Hitler and the Nazis to "play" with a democratic Germany in the Second World War. If games are algorithmic allegories that represent situations transcending their design worlds (Galloway, 2006), the choice of alternative history seems to represent a disposition towards a hardcore historical revisionism. This does not necessarily mean that players who favor Nazi Germany are sympathetic to Hitler. They may well be in the process of creating multiple historical pasts that will allow them to interpret history in a variety of alternative ways, since this is considered a democratic right—"it has to do with what everyone wants", a student noticed. The very fact that "modifications" are created by gamers themselves results in closing the gap, on the one hand, between the allegory and the actual stake and, on the other, between experts (historians and game designers) and non-experts. Thus, they function as multimodal expressions that aim to adapt the original narrative of the game to the cultural, aesthetic, and intellectual needs of individual users. This movement seems to mark a liberating experience, especially for young people who experience history teaching at school as repression.

Algorithmic Universe

Another distinction made by research participants has to do with the quality of time devoted to games and social media. In games, the engagement is more demanding. The time of the gameplay is, for the most part, continuous. The players must be present and active throughout the game session. On the other hand, social media platforms allow for greater flexibility: users may log off and return later, participating in discussions without being continuously present. The general sense conveyed by the students implied that they feel rather restricted by the scenarios and the rules of gameplay. In this context, they experience time as a succession of tasks. Many students stated that although the multimodal context of the games (graphic design, animation, audio environment) encourages immersion, what actually counts is gameplay itself *and* the corporate policies aiming at user engagement. In other words, they assume that the process of sensemaking is not primarily linked to the multimodal character of the games but to what is allowed and what is inhibited by the algorithmic rules of the games. This results in an internal differentiation of the experience of temporality. If, for example, players have paid a subscription for a certain time, they feel obliged to play intensely so that they get the most out of it. Similarly, gaming practices like "grinding" or

particular “chain quests” also intensify gamers’ engagement. If the aim is to achieve a particular rating or collect artifacts (“badges”), which are available every day in limited numbers (so that if you don’t get them today, you won’t be able to get double the next day—a policy that aims at forcing players to log in every single day), time is perceived as “obligation” and thus as unpleasant time. As a result, during the gameplay, two distinct times coexist: leisure time—which is connected with pleasant moments, achievements, and socializing with other players—and labor time, which is associated with obligations and “the boring stuff”. The students brought up this distinction but, interestingly enough, they seemed not to pay special attention as they took it for granted: “besides… everybody knows that games also have grinding”.

A hyperbolic setup from World of Warcraft depicting the work that must be done by the player to control the various parameters of the gameplay. Image source: [Game Design Snacks Wikia] (available under CC-BY-SA).

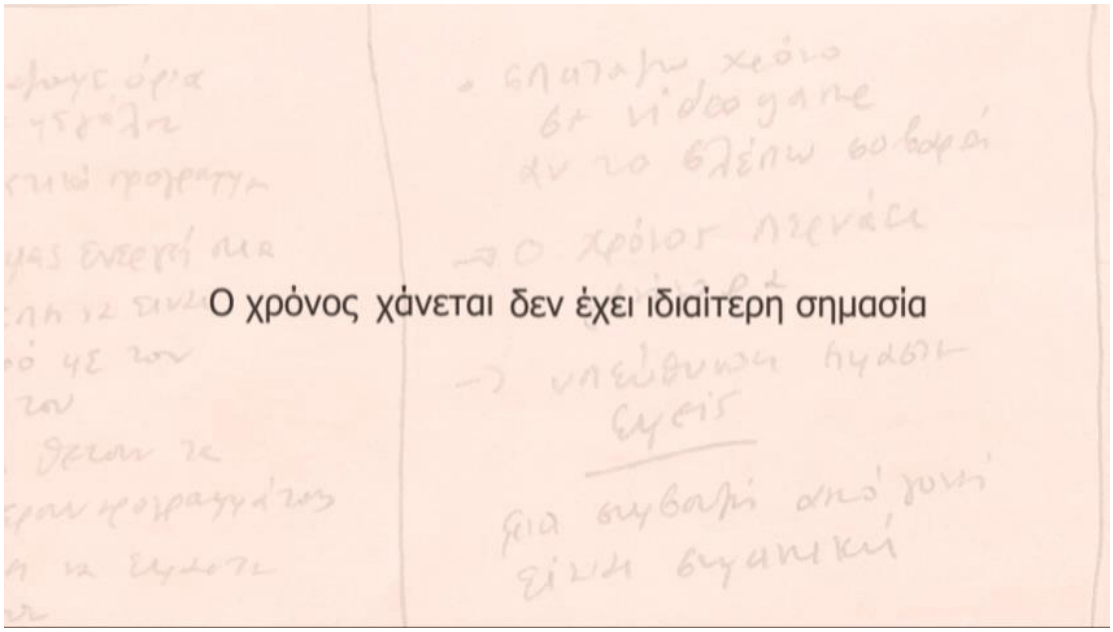
This unconditional acknowledgement seems to align with theoretical accounts that stress the relationship between the function of the algorithmic structure and the procedural character of games. For Ian Bogost (2007), the notion of procedural rhetoric implies the articulation of (social and political) arguments by means of game rules. These arguments convey images of the world or of how the world should be, not through words (as is the case with “traditional” rhetoric) or images (as is the case with visual rhetoric), but by forcing players to conform with particular rules, which are taken for granted.

Contrary to the commitment they experience in gaming environments, the majority of interviewees stated that they feel freer on social media. Although the mechanics of social media concerning the permanence of the posts varies, they generally feel that they don’t need to be continuously online for fear of missing something. Hardware also plays a role in this. The fact that most of the users sign in to social media platforms from their mobile devices enables them to spend short time intervals online from wherever they are. At this point, it would be interesting to focus on the linguistic means employed by the users to describe the relationship between online and everyday time. Whilst time

in everyday life always comes to an end ("you go out for coffee and at a certain point this ends and you get back home"), time on social media flows endlessly. You can always return and check for new posts, photos, and videos, or chat with other people. The function that makes this possible is—as Manovich has stressed since the early 2000s—database. Databases that support social media can store, organize, classify, and redistribute a wide range of everyday experiences, producing discontinuous narratives *on demand*. This is probably why students found it difficult to understand the question of how they experienced the possibility of being in a different time zone to their interlocutor(s). You *don't need to be in the same time zone* to have access to facts and discourses. Social media temporality is asynchronous by default. The conversation pauses ("stays where you leave it"—even if it is for the limited life cycle of Instagram's stories) until you resume it. Thus, time on social media is experienced as the sum of partial durations that represent the active engagement of the user.

In addition to this, users may simultaneously participate in more than one conversation, where time moves forward at different speeds. This instills a sense of multi-temporality, a *polychronia* where users move from one time to another, skillfully weaving their personal narrative: "It's like building a bricolage, like piecing together independent time-fragments" (boy 15). When students were asked to further elaborate on this notion of *polychronia,* both on social media and in gaming environments, they noted the existence of a distinct timeframe. Multiple subjective times of the participants boil down to a *shared time* within the platform: a pure duration linked with the narrative produced through the interaction of the users but located outside the conventional timeframe of each of them.

A relevant expression used by a student to denote the notion of temporality while playing games such as World of Warcraft was "frozen time". The meaning of this expression is that when users are absorbed in the gameplay, the experienced time is disconnected from their natural surroundings. They feel that they have withdrawn to an environment where there is no time at all or where time flows in a different manner: "I feel like I reside in a void", noted the same student. Indeed, she stressed that it takes her *some time* to switch from game time to "real life" time. Closely related to the notion of "frozen time" is the fact that many students reported that while in games, they don't really think; they rather respond to challenges and tasks without trying to capture the big picture. In other words, they experience a state of suspense.



"Time fades away. Time does not matter much."

Meaning and time

A crucial difference between games and social media from the perspective of temporal experience seems to be that in games, emphasis is placed on purpose and reward, whereas on social media, it is placed on meaning and communication. This is to say that when the game mission is completed, time is over too—although the next round may soon begin. On social media, time never ends because new meanings arise all the time. Thus, time on social media is like a worm screw: every new feed gives a turn to the screw but does not bring it closer to an end. However, although this is an important difference, there is not a clear boundary between social media and games. Games function as social media too, even before the advent of the latter, in the sense that they form a context of communication, hanging out with friends and chatting. Social media, on the other hand, are highly gamified themselves. Elements of game mechanics like the collection of badges, rewards and level progression have been employed to promote user engagement. At the same time and for the same purpose, they also offer their users a wide range of digital games specially designed to be played in social media environments (although in the present study we don't consider them). As a result, in our research, rather than stressing the difference between digital games and social media, we chose to focus on how the affordances of various media were seamlessly incorporated into the daily practices of the students. In other words, we tried to look at the temporalities that emerge from interactions where "natural" and "digital" experiences conflate to constitute uniform digital environments. Thus, according to some students, in multiplayer digital games time flows faster, precisely because, as one of them stated, "games in this context are also a kind of social media". Another student emphasized the opposite disposition, noting that, in single-player digital games, the fact that players are alone makes time flow slower. Both statements confirm the same thing: communication with other users, no matter whether it takes place genuinely on social media or in digital games, is the crucial factor that, by enhancing the emotional content of temporal experience, speeds up time flow.

Although our ethnography does not exclusively focus on the concept of the present, at this point, we find ourselves on a similar path to Rebecca Coleman. Coleman focuses on how "the now" is produced by the interplay between human and non-human practices, particularly between the affordances of media and the understandings of professionals working in the field of digital media. She suggests that, since the experiences of "the now" seem to become dominant in digital societies, the theoretical and empirical focus on how it becomes the object of creation and management is essential. For her, "the now" is not coherent and unified but composed of a range of "nows" (Coleman, 2020a, 1680-1681). On a similar account, our findings confirm that, although there is no doubt that games' design plays a crucial role in shaping the experiences of temporality, social practices are also vital. Hence, the experience of temporality cannot be solely reduced to the medium; it should rather be examined as an overall experience encompassing participation modes, communication patterns and interpersonal bonds developed during digital interactions.

Both on social media and in games, the distinction between "digital time" and "room time" is clear. Although individuals experience, for the most part, a hybrid space emerging from the intertwining of virtual and domestic sensory data (pictures, sounds, video, smells, placement of human bodies etc.), in the case of time, this hybridization occurs only under specific circumstances. As already mentioned, one important element reported by the students was the sense that conventional time comes to an end when a task is completed—"you get back home"—while digital platforms employ techniques aiming at keeping users endlessly busy. The students were asked about the way they experience the relation between the two distinct timeframes. Their answers indicate a quasi-antagonistic relationship. When they are immersed in game narrative, any sign from the other side of the time boundary causes a kind of disruption: "When your mother enters the room", she disturbs time flow. The same holds on a more technical level: lags that occur due to network or server failure also disrupt smooth time flow and the experience of a shared virtual space (cf. Boellstorff, 2008, p. 101-106). The unexpected emergence of a different timeframe temporarily throws users into a hybrid context where they experience a "double time". This is closely related to another issue. When activity in digital media comes to an end, one needs some time to "decompress" and align with the

“room time”. During this process, “room time” is experienced as sparse time and users need to slow down: “You can’t be killing monsters for two hours and then just start talking to your mom!” [it’s always mom!].

"You can't be killing monsters for two hours and then just start talking to your mom..." (image from World of Warcraft, Blizzard Entertainment®).

Double time is experienced in “historical” terms as well. As already mentioned, research showed that, in some cases, historical games motivated players to further inquire into the factual details of the game’s narrative. However, this interest never coexists with gameplay itself. While they are active in the game, students are not particularly interested in historical precision or historical context per se. This is a post-game interest incited by the *memory* of the gameplay and, as stated by a student, by the expectation that understanding the historical context will allow him to perform better. While in gameplay, however, players respond to immediate calls—they interact with the algorithm itself—and do not pay particular attention to the texture of historical narrative. Thus in-game and post-game frames of mind establish a distinction between two different perceptions of *the same* time as performative and historical time.

Future

One important issue arising from our research has to do with the meager presence of the future. With the exception of the answers of just three students, no other reference was made to the future as part of time or history. The great majority of the collected answers clearly implied that time *is* the present or the past. This disposition most likely results from the fact that, in school, emphasis is primarily placed on the past (especially the “glorious” historical past of the Greek nation). The few references to the future came from students playing games that take place in future worlds (The division 2, Outer Wilds, Eve Online) and reflect their ideas about how life will be in fifty years from now. An interesting twist in their accounts is that whilst, on the one hand, they tend to project current life’s features to future societies, on the other, they are aware that the game’s design forces them to see the future as radically different. They feel that they can create imaginary stories for the future, but always in a context specified by the designers of the game. So, again, a duality of temporal experience emerges: present and future coexist but this coexistence is experienced as a tension.

The majority of the students, though, don't seem to bother about the future. To be more precise, it is as if the future were compressed into the short time that lapses between sending a message and receiving a response (cf. Rebecca Coleman's [2020a] account about "the now"). And this time, as already mentioned, is never continuous but always incremental. It is as if all dimensions of temporality were absorbed by the (perpetually moving) urgency of the present. Maybe it is important here to be reminded of the approaches that view games as allegories of social life. For example, Janet Murray (2016 [1997]) claims that even a game without literal storytelling, like Tetris, may *narrate* the everyday life experiences of Americans in the 1990s. Contrary to a jigsaw puzzle that at a certain point comes to a completion, Tetris never ends. Every time a line is successfully completed, it instantly dissolves to free space for the next challenge. According to Murray, this speaks for the experience of Americans who feel compelled to undertake a new assignment every time a task is completed.

This experience of a continuously moving, urgent (though in a more playful sense) present was conveyed by many students who were interviewed by the researchers. The metaphor of worm screw mentioned earlier applies in this case, too, indicating that the future does not exist because it is perpetually absorbed by a powerful present. Of course, generally speaking, there may be cases of children who forcefully express their concern about the future, as the widely publicized Greta Thunberg's interventions indicate. There might even be children's movements associated with environmental issues that find their way into the public sphere (Nolas, 2021). But this is not the case for the children in post-financial crisis Greece who attend a school dominated by the looming prospect of "Panellinies" (national exams). In fact, the students who participated in the research were born between 2004 and 2008. Thus, they are not simply "digital natives", but also denizens of local and global financial, political and social crises. Of course, not all of them experience these crises in the same manner, but the successive cultural shocks that culminated with the global quarantine and a widespread feeling of insecurity undoubtedly prohibit the emergence of a comprehensive vision for the future.

Many times

The coverage of the research presented here is quite limited both in terms of numbers and in terms of social representation. Thirteen to sixteen-year-old high school students in post-financial crisis Greece may not represent the global average. But due to the particular nature of digital media (which, by definition, transcends locality), it may indeed capture some important aspects of the ways people experience time in digital environments. There is no doubt that further research is required to specify the fine texture of this kind of temporal experience and accurately locate possible cultural and social differentiations. However, we assume that "Diachronies" may contribute to an initial mapping of the area under investigation by setting some reference points for studies to come.

One such important point has to do with the discourse about guilt. Cultural taxonomies cross the border between everyday life and virtual environments. Particularly for students approaching the age of 16—when the preparation for national exams begins—digital activities like gaming and social media increasingly take the form of wasted time. However, the peculiar condition of the pandemic and the wide use of digital media in education contributed to a certain legitimization and "moralization" of these activities. They not only function as a fail-safe against social isolation but also have been adopted by official authorities for the organization of education and social life at large. This results in students developing an ambivalent attitude towards time spent in digital media.

Concerning temporal experience itself, the research showed that there is not a single "digital time" opposed to a single "natural time". In fact, it seems that individuals who are active in digital environments participate in a *polychronia*, a multiplicity of temporal experiences that depend on the specificities of the various digital platforms but also, and most importantly, on the ways users get involved with them. This realization is significant as it destabilizes stereotypical views about the duality of time that often offer the basis for discourses about "social isolation", "addiction", and the "dangers" of digital activities.

Time experience in games is different from time experience in social media: continuous and discontinuous, finite and indefinite, respectively. In gaming environments, time resembles (or, might be said, imitates) conventional time, and this facilitates immersion. However, this is only a tiny part of the user's overall experience, as different perceptions of time come into play even in such "straightforward" practices as gaming. On social media, time is experienced primarily as duration—the sum of independent moments that are linked with the "database narrative" gradually built through users' communication.

Qualitatively speaking, an important distinction is the one between leisure time and labor time, especially associated with different tasks performed during gaming sessions. A third "l", learning time, refers to both games and social media but acquires different meaning in each context. Learning in social media is synchronous and concerns useful information gathered whilst users are active on the platform. Learning in gaming is primarily asynchronous, as it is a process incited by the game's narrative but taking place in other media (such as Wikipedia and other online educational resources) after or between the gaming sessions. This leads to an "expansion" of virtual time into users' conventional timeframe and a partial conflation of the two contexts.

Polychronia is expressed in another way, too. Immersion in a game's narrative cuts off individuals from their "room time", and indeed many stated that it takes them some time to get back to "real life". But it seems that whilst absent from their room, individuals spend more of their time in a "communication bubble", a distinct temporal context where they intensely interact with other users, make plans, implement strategies, and share affects. Indeed, many students noted that time flows faster when they are in this state. We call the time spent in this communication bubble "performative time"; students' accounts seem to indicate that this, and not immersion, is the prevalent context of their temporal experience.

In many games, agility is considered an important trait of game characters. Our research indicated that the same quality characterizes the so-called digital natives. None of the students we interviewed seemed to worry about the *polychronia*. They all take it for granted and develop intuitive ways to efficiently and profitably handle the transition from one context to another. They are able to quickly adapt to the qualitative features of each context, be functional within it, and even control the "jet lag" they experience when they land in their room. New qualities, new skills. Many sections of social life, especially education, will surely profit from a more detailed and in-depth survey of the new *habitus* arising from the conflation of virtual and actual worlds.

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Todor Hristov / Tsvetelina Hristova
THE BULGARIAN GREEN DEA

As the European Union develops its strategy for a Green Deal that would prepare its members for a transition to a more sustainable economy, some key assumptions and mechanisms for economic development are bound to repeat and exacerbate the damages from past transitions. Most importantly, these mechanisms deepen a course of social transformation the beginning of which was set through the 1989 Transition to free market capitalism in the East.

The first two sections of the report describe the imaginary horizon of Transition in post-socialist context and in the context of the Green Deal. The third section summarizes the main features of the emerging market of environmental risks. The following sections discuss the function of the market as a security apparatus, the nexus between green and digital transition, and the regime of subjectivation that should support the shift to clean energy. The last section suggests hypotheses about the general and the local effects of the green transition with a special emphasis on upskilling and outsourcing in the IT sector.

1. The logics of Transition with a capital T

The notion of transition established in the aftermath of 1989 is still a powerful motor of imaginaries that determine the limits of political action. Srećko Horvat and Igor Štiks (2012) talk about "the desert of transition" – the notion of transition as a purgatory that has to be endured and suffered through in order to get to the other side, a story similar to the wandering of Moses in the desert and the suspended temporalities of cleansing and perish on the journey to the "promised land" of capitalist prosperity.

Conceived thus, Transition works not just as a series of social, political, and economic transformations but also as a discursive tool that shapes and limits ideas of justice in the post-socialist world by mobilizing the ghost of "zombie socialism" (Chelsea and Druț 2016) as a scarecrow and explanatory framework for any failures of the new regime. Moreover, the narrative of Transition negates the transiency of all instances of political consensus, shared horizons, and political programs and hence, last but not least, blocks out the notion of "transitions without a telos" (Mezzdra 2011) where struggle, renegotiation, and contestation are still possible.

In short, Transition works through erasure, denial, and the tyranny of an idealized model, which are exercised both through discursive power and through the mechanisms used to transform and establish new institutions, infrastructures, and routes of the constitutive flows of socio-economic spaces – money, commodity, people and, increasingly, data.

It is still commonplace in political discourse to regard the socialist period as a stagnant and monolithic temporality dominated by deficits, shortages, and totalitarian power (Thelen 2011). This perception has largely justified the need for Transition (with a capital 't') – a policy framework in which the coupling of liberal democracy with neoliberal capitalism is considered quasi-sacred and thus remains unquestioned.

Yet, the socialist period was a changing and self-reinventing time that, towards its end, had introduced many of the principles that the capitalist transition claimed to promise: increased trade and collaboration with non-socialist countries, nascent forms of private property and managerial

governance, a growing opportunity for political pluralism and some possibilities for critique of the regime (Nakova 2003). Towardms its end, socialism in Bulgaria was slowly taking a shape that resembled a vision of "capitalism with a human face" where the state was trying to navigate economic reforms with protection of the social rights for workers.

Ecological movements were an important part of this nascent internal critique of the regime, together with artistic critiques of alienation in industrial societies and denunciation of power inequalities. The ruptures of 1989 not only dismantled the institutions and infrastructures sustaining social security and communality, they also interrupted the growth of such internal critique that evoked the ideological principles of communism in striving for social, ecological and political justice.

This context of the Transition that has shaped the post-socialist space and Europe as a whole situates the European Green Deal in relation to three important questions. What discourses are being erased and silenced through the narrative of a green transition? What mechanisms are being used? And what are the effects of layered Transitions that each generate its own horizon of idealized and reductive futurity?

2. The European Green Deal

In the past couple of months the discourse of "green" transition has disturbingly aligned itself with past Cold War dichotomies and has managed to once again construe the image of (neo)liberal capitalism as the only viable option for our future, an ideological narrative that brazenly borrows from the myth of the Transition. On a geopolitical plane it has once again juxtaposed the progressive West to the authoritarian and regressive East. While the REPowerEU plan links energy transition to geopolitical positioning against Putin's Russia, there are indications that the plan includes too many provisions and exclusions that would allow oil and gas giants in the EU to still import Russian fossil fuel (Corporate Europe Observatory 2022).

At the same time, the programme for a "green" transition continues to draw on the pillars of free market development introduced through the structures of international aid, infrastructure grants, and fantasies of upskilling labor. The key mechanism for implementing the Green Deal transition remains the EU's Cohesion Fund (EC 2020), a scheme for the redistribution of capital that has helped foster dependencies between political and economic power in post-socialist countries like Bulgaria (Hristova 2021). The Cohesion Fund, which is seen as instrumental for the implementation of a just transition, sets the ideological and political apparatus for transforming the territorial structure of the European Union into different categories of regional units. The poorest units are reinterpreted as vehicles for the circulation of capital through policies privileging foreign direct investment, tax cuts, and redistributing public funds to private companies. This logic of development through private capital was established as the core element of Transition in Eastern Europe and, ironically, the mechanisms outlined in the just transition plan have already been put in practice and have consistently failed in the region.

3. A new market

The logic of the Green Deal consists in transforming environmental risk into a component of value.

That will make the market more governable, and it will allow the economic actors to profit from the production of less risk, of risk that is reduced below the threshold of the normal distribution which in this report we will call negative risk. However, that will devalue a substantial amount of capital in Southeast European economies for which the funds allocated to just transition will be unable to compensate. In effect, the Green Deal will increase social inequalities, aggravate poverty and stimulate further loss of human capital in Southeastern Europe.

To explain how risk is going to define value, let us take as an example e-fuels. They are produced from water and air, potentially by captured CO2 emissions, by means of clean electricity so that they do not have a carbon footprint. Since e-fuels can be used just as fossil fuels, their differential value consists in the fact that they are clean, they generate not only energy but cleanliness, a negative environmental risk (although studies suggest that they can be harmful to the environment in other ways[1]). Presently, e-fuels are uncompetitive because their production is very energy intensive. The projected cost of e-fuels produced in the EU is at least double the price of petrol, and even if the production is outsourced to countries less committed to the green transition, it amounts to more than 150% the price of petrol (Krajinska 2021,34). Thus e-fuels do not have an actual use value on the energy market.[2]

The Green Deal has nevertheless commodified e-fuels as a technology. Although the technology is not actually productive, it constitutes an intellectual property that can attract grants, subsidies, investment, it can generate capital and therefore it has an actual exchange value independent of the use value of its product. That exchange value, however, depends on the potential of e-fuels to replace fossil fuels, to power combustion engines, particularly in aviation or in maritime transport where batteries are not an option as well as to significantly lower the costs of developing a clean energy infrastructure. The investment that the technology currently attracts is essentially an advance on its potential use value and in that sense it functions as a fictitious capital (Marx 1959, 282). If the potential of the technology is exhausted, if it turns out to be imaginary, then investments in synthetic fuels will amount to a frozen, perhaps even wasted capital. The potential value of e-fuels, however, is vulnerable to risks: the development of the technology can run into problems; it can be abandoned as a fruitless invention; the marketization of the product can be infelicitous; a competing technology can turn out to be more successful; other economies can attract the companies owning the technology by more generous subsidies as in the case of the US Inflation Reduction Act; the product of economies that are not committed to green transition can shrink the market for clean energy; finally, there is a risks of an incomplete, unambitious or failed green transition. To avoid the devaluation of capital invested in clean technologies such as e-fuels, risks have to be controlled.

4. A new security apparatus

To control a risk does not mean to fight off a threat. In contrast with danger, risk represents the probability of a loss and hence it cannot be eradicated because even if the probability is extremely low, it never amounts to zero (Ewald 1991, 202-204). Since annihilation of a risk is impossible, to control it means to normalize it (as we are going to explain below, that does not capture negative

[1] Ironically, the potential of synthetic fuels can be used to avoid the ban on the sales of new automobiles with combustion engines planned for 2035.

[2] Although companies like Bosch or ExxonMobil have already opened the first e-fuels plants, the production is expected to become marketable by 2030 or 2050 (Searle 2020).

risk because it implies a reduction of the probability of damages beyond the normal levels rather than normalization).

To calculate the probability of a loss, one needs a mass of cases. If the mass is large, and if it is registered for a long period of time, the probability usually turns out to be normally distributed. To normalize a risk means to reduce it to its normal distribution (Foucault 2007, 58-59). That, however, cannot be done by prescribing norms. Let us take as an example shortages. If the authorities try to reduce the risk of a shortage by controlling the prices, that can discourage the producers and in the long run the risk can actually increase. In the perspective of liberalism as a governmental technology (Foucault 2010, 63), it can be reduced more efficiently if the authorities refrain from intervention because the free play of market prices will balance supply and demand. The free market, however, brings about second-order risks such as monopolies, cartels or unfair advantage. The authorities should control such second-order risks by identifying the points at which they significantly exceed the normal levels, by identifying the factors correlated with the excess, and by acting on the factors so as to reduce the risks for competition or at least to prevent it from escalating into a crisis in which the normal distribution will be no longer valid (Foucault 2007, 90-91).

The Green Deal has inherited that mechanism of risk control from neoliberalism (Foucault 2010, 132, 162; 2007, 34-37); but to be able to control the risks for the fictitious capital generated by the green transition, that mechanism needs to be transformed. (1) The normal level of the environmental risks posed by fossil fuels is already unacceptable. Therefore the strategic documents provide a new definition of danger: it is no longer considered an intensification of risks beyond the threshold of the normal, it is rather defined in terms of a deviation from the norm of a net-zero economy; since the mass of actual cases differs significantly from the norm, the normal distribution of risks already amounts to a danger, to a crisis which suspends the application of a norm that is nevertheless valid thus opening up a zone of indistinction between facts and norms (Agamben 2008, 40), bringing forth a state of exception that necessitates a new form of sovereign power (already indicated by the emergency powers claimed by the European Commission ranging from the standardization of energy markets to the collection and redistribution of the income from the future tax on carbon footprint that is supposed to gradually replace the older forms of taxation). (2) In the context of the Green Deal, one can no longer expect that competition is going to normalize the risks by itself. Since many clean technologies are still not competitive, competition against fossil fuels poses a risk for their development and marketization. The Green Deal plans to reduce the risks of competition by a series of interventions:

(a) In order to cancel the advantage of fossil fuels, the European Commission plans to make fossil fuels more expensive by taxing the carbon footprint, by obliging the end consumers to buy greenhouse gas emission permits compensating the environmental risks of their behavior, by introducing regulations that will increase the administrative costs of unclean energy, by imposing standards that will sanction or ban combustion engines consuming too much energy or leaving a heavier footprint. On the other hand, the Green Deal is supposed to make clean energy less expensive by providing subsidies as well as cheap and publicly guaranteed credit, by offering funding that makes development of clean technologies lucrative before their marketization, by making the investment into clean technologies risk-free, by creating a stable demand due to the shift of the European institutions to clean energy, by setting goals for reduction of carbon footprint that will progressively

turn fossil fuels into a problem for the national and local authorities. Additionally, the risk of clean technologies is reduced by crises such as the war in Ukraine which made natural gas much less economically efficient than renewable electricity reinforcing the trend that emerged in the period of the Covid-19 pandemic (IRENA 2021, 35-36).

(b) The focus on value chains reframes competition as a contest between modes of production rather than between products (see for example EC 2023, 1-6; EC 2022, 1516; EC 2019, 7-8; EC 2018, 19; . That makes possible a more detailed and comprehensive identification of risks at any step of the production process, and hence more detailed and comprehensive control. (c) The scale and the expediency of the transition necessitate a regulation of the global environment that the European Union can regulate only to a limited extent. The Green Deal hopes to solve that problem by reconceptualizing borders: they are supposed to function as a membrane that modulates the flows of goods, technologies and capital, blocks the inward flows considered high-risk in terms of carbon footprint, digital, economic or political security, and prevents the outward flow of clean technologies.[3] (d) The European Commission hopes that the modulation of flows of capital, goods and technologies by extensive border control will bring about a new type of capital - access to the European market - that can be exchanged for the implementation of regulations and regimes of standardization beyond the borders of the EU, particularly in partner countries that are to a significant extent integrated in the European economy (but also on a global scale due to the size and the relative centrality of the European market). (e) The borders of the European Union are supposed to be permeable to flows from countries that are considered allies, friends or partners sharing the European values. In that case, the access to the European market will function as an empty signifier marking the dividing line between 'us' and 'them', and in effect it will reproduce political antagonisms. To sum up, the Green Deal rearticulates competition as a zone of condensation of risks that need to be controlled. In the context of the green transition, therefore, competition can work only if it is coupled with a security apparatus.

5. Digitalization

The apparatus of economic security that will be triggered by the Green Deal needs to calculate risks on a new scale, in finer details, in real time, at a speed which reduces to a minimum the time interval between the emergence of risks, their registration, the identification of excesses, the isolation of correlated factors, the isolation of possible points of intervention, the evaluation of the risks of intervention itself. Such calculations require mechanisms of monitoring, registration, collection and structuration of data. In this context of increased focus on risk reduction, datafication and digitalization are seen as integral to the implementation of a green transition and the containment of environmental risks. Their interdependence can be illustrated by an idea central to Farm to Fork strategy: to monitor in real time the usage of fertilizers and pesticides in the European agriculture so as to detect risks of overuse and prevent or sanction it; that will improve significantly the quality of the soil, it will reduce the carbon footprint of agriculture, the health risks of industrial food production, the dependency on foreign suppliers; yet a reliable and comprehensive monitoring of pesticides and fertilizers will become possible only after digitalization, due to the transition to smart farming that will transform agriculture into a matrix of biochemical and environmental variables controllable by artificial intelligence; smart farming, however, requires extensive investment

[3] It is unclear though how boundary control can protect the economy from the flight of economic actors to countries such as the United States.

in fixed capital and loss of unskilled or semi-skilled jobs that the European Commission plans to compensate by support for innovations and by the policies of just transition.

The digital transition in Bulgaria is currently in its initial stage. The relevant strategic documents of the Bulgarian government declare that 2/3 of the labor force lacks digital skills (Council of Ministers 2020, 15), most users limit their activity to social media and online calls (Council of Ministers 2017, 13), only 6% of the companies sell their products online in the country, and only 3% are active on the global markets (the EU average is 17%, Council of Ministers 2022, 80); additionally, in 2020 85% of the households lacked access to broadband and 41% to high-speed internet (the EU average is respectively 66% and 23%; Council of Ministers 2022, 134). The government is planning to address the challenges of digital transition by investing in infrastructure, by providing support for upskilling and by relaxing the regulation of start-ups.

At this point, it is difficult to predict the effects of digitalization on the labor market. Thus we will limit the discussion to three hypotheses: (1) It seems plausible to expect that digitalization will develop at an incongruous pace in different sectors. It will probably be slower in labor-intensive sectors such as agriculture due to the dispersed ownership of land impeding the large-scale investments necessary for the transition to smart farming. (2) Additionally, the efficiency of many enterprises depends on bricolage to which the future AI can turn out to be incapable.[4] (3) Even if we assume that a significant share of the work tasks will be automated by 2040, the earliest moment of time predicted by experts (Roser 2023), the effects of automation will be ambiguous. Perhaps automation will shrink the available jobs. From the perspective of the employer, however, the price of labor essentially amounts to the costs of replacing the laborer. The automation of production will open up jobs that require a significant investment in upskilling, and such skilled workers will be more difficult to replace. Furthermore, work in an automated environment is going to require intense alertness (Negri and Hardt 2001, 423) that can lead to a faster amortization of the labor force. Due to the combined effect of decreased supply and increased amortization, one can expect the price of skilled labor to rise. That can have unpredictable effects on the Bulgarian labor market which is currently shaped by the pressure of a substantial reserve army of labor pushing the price of unskilled labor below the costs of reproduction of labor power. If the digital transition shrinks further the labor market and increases the cost of entry due to the increased demand for human capital requiring a substantial investment in education and skills, that can additionally increase the economic overpopulation and bring down the price of unskilled labor to a point at which employment will become irrational, or it can even amount to a self-sacrifice on the part of the workers. In effect of the digital transition, however, the reserve army of labor will be actually working, it will be reproducing its labor force, in the process of its reproduction the surplus population will be producing consumption without which the markets would come to a halt, and it will be producing life that will sediment as a general intellect commodified and marketized as AI technologies. If that turns out to be the case, digital transition will actually lead to increasing exploitation of labor that, precisely because of being devalued, will produce commons that will be enclosed, privatized and alienated by the digital companies. In effect, digital transition will deepen the exploitation of labor, and generate poverty and precarity that will be only partially compensated even by a universal

[4] We conceive of bricolage as a surplus of labor that is not associated with pre-designed equipment, stable procedures or fully defined functions and hence produces situated, tactical innovations (for example, one of the crucial advantages the Bulgarian international transport is the ability of the drivers to maintain and repair typical problems in their trucks by themselves which saves a considerable amount of time and money to the companies).

basic income.

6. A new regime of subjectivation

An apparatus of security as the market of negative risks is not a despotic machine. It does not dictate conduct, it merely conducts the conduct of the economic actors by regulating the costs of different choices, by increasing the costs of high-risk choices, by drawing dividing lines between 'us' and 'them', between our allies and enemies. Such a regime of governmentality can work only if the social and economic actors make responsible choices. Because of that, the market of negative risks needs a regime of subjectivation. The strategic documents insist that social and economic actors should be constituted as subjects of responsibility (see for example EU 2019, 22-23; EU 2018, 15). In the context of the green transition, however, responsibility is acquiring a new meaning: the governmental and economic actors are supposed to recognize themselves, one one hand, as subjects of ambition (perhaps one of the most frequent words in the communications by the European Commission); on the other hand, the social and economic actors are constituted as subjects of responsibility for the environment and, to the extent that the environment has been already devastated, as subjects of guilt. As in liberal and neoliberal markets, subjectivation is going to rely also on the dividing line between the rational actors and the irrational, mindless voices who are unable to speak responsibly, to make rational choices and hence forfeit their right to choose (Foucault 2007, 65-66). As long as one can judge on the current European documents on disinformation, that dividing line will increasingly define the realm of rational discourse and, just as the borders of the European market, is going to be constituted as a frontier, a frontline that has to be protected by an apparatus of information security waging an endless war against conspiracy theories and fake news.

7. Unintended effects

7.1. General effects

If the Green Deal succeeds, the ecological crisis will be averted and the European economy will enjoy explosive growth, perhaps comparable to the growth generated by the reconstruction of public infrastructure after World War 2 (although many climate activists, including Greenpeace, criticize the deal that is not ambitious enough to cancel out global warming). Yet until the Green Deal succeeds, even if it fails, it will bring about important effects: it will create a new market, a market for environmental risks conquered by capital; on the new market, the entrepreneurs will be able to convert research and development of clean technologies into public subsidies, public investments and publicly guaranteed credit; the technologies however will remain in private hands, they will be protected against competition as intellectual property, and since the technologies will be developed by public investment, the private property on them will amount to privatization of public assets, to a new wave of private enclosure of public goods, a new wave of accumulation of capital through dispossession (Harvey 1996, 91).[5]

The dispossession, however, will be indirect. Instead of enclosing public goods, it will generate inflation and public debt. The inflation will erode the value of labor and social benefits. The need to service the debt will stimulate austerity, particularly if growth fails to meet the expectations. The

[5] A detailed analysis of dispossession caused by EU-funded renewable electricity projects in India see in (Dwivedi and Munshi 2021).

combined effects of inflation and austerity will make it necessary to limit the access to public goods. The governments can do that by curtailing social rights or by rejecting the demands of segments of the population such as migrants, foreign or precarious workers. As the postsocialist transition has demonstrated, however, the access to public goods can be more efficiently restricted by reinventing the governmental functions of the market (Foucault 1997, 373). If public goods are transformed into a market, the market will exclude the social groups that are unable to pay the cost of access, not only in monetary terms but also in terms of time, effort and knowledge. As long as such social groups are not excluded by a decision of the government, as long as the market is believed to be a mechanism of free and fair distribution of wealth, the curtailment of access will not constitute a discrimination or a violation of social rights, it will be as free and fair as market liberalism; the social rights of the excluded groups will not be denied, they will merely turn into manifesto rights that cannot be actually enforced. The operation of the market as a mechanism of exclusion can be further refined if it provides a differential access to public goods reflecting the different capital of the social actors. Then the access will be stratified in a manner that reflects social inequalities. The postsocialist reforms of healthcare or education provide a good illustration of the function of the market as a mechanism of unequal distribution of public goods: the socialist state recognized universal rights of free access to healthcare and education that is still enshrined in the Bulgarian constitution; in the 1990s, both rights have been transformed into markets that effectively exclude the lower classes and provide services of graded cost reflecting the different purchasing power of the social actors; the stratified access to healthcare and education has brought about a graduated distribution of health and unemployment risks condensing in the case of minorities, unskilled workers, rural areas, and elderly.

Under the combined pressure of austerity, deindustrialization and inflation, the future market of environmental risks can bring about similar effects. If the Green Deal conceives of clean environment as a public good and transforms it into a market, that can bring about social exclusion, stratification of the access to public goods, transformation of social entitlements into manifesto rights (in the sense of recognized but unenforceable rights) progressive condensation of excessive risks in social danger zones as the migrants, the city underclass, the rural or the underdeveloped regions. The funds allocated to just transition will be hardly able to compensate for that because they are currently intended for alleviating energy poverty and lowering the costs of unemployment. Even if the just transition policies are extended so as to inject more purchasing power in the most vulnerable social groups, that will help the new markets run more smoothly, but it does not seem plausible to expect that it will remedy social exclusion, loss of social rights or deeply stratified access to public goods. It is perhaps because of this implausibility that the translator of the European Green Deal website into Bulgarian has made an unintentional mistake, a parapraxis, and translated the slogan of just transition 'no one should be left behind' by 'никой не трябва да не бъде изоставен' ('no one should not be left behind').

7.2. Regional effects

7.2.1. Dispossession

Dispossession triggered by the Green Deal will be particularly salient in the case of the Bulgarian economy which is heavily dependent on fossil fuels. The government has already committed to

closing down the coal-based power plants. Depending on the level of ambition for phasing out coal, the country will need to import electricity instead of exporting it, as it is currently the case. According to the current estimates, which do not take into account the fact that the green transition is expected to significantly increase the demand for electricity on the European markets, the annual costs of electricity for private consumers will rise by about 500 mln EUR on an annual basis (Szabó et al. 2020, 35).[6] Additionally, phasing out coal is expected to lead to loss of 43000 to 54000 jobs (Primova, Vladimirov and Trifonova 2022, 37; Szabó, László et al. 2020, 38). The scale of the dispossession, however, will be more considerable. Since it is difficult to make a detailed estimate, we will limit the discussion to five hypotheses: (1) If the European Union bans combustion engines, that will eliminate the bulk of the Bulgarian cars, 86% of which are more than 10-year old (AAP 2018) with a high level of carbon dioxide emissions of 133 g/km for 2021 (the EU average level is 108.2 g/km; Iliev 2020). The Bulgarian population, however, buys second-hand cars not because they dislike the new models. Many will be unable to afford an electric vehicle, and as the public transport beyond the cities is limited, they will be effectively immobilized. (2) If the market of electricity for individual consumers is liberalized, as the government has already made a commitment to do, the costs of energy will escalate additionally. The increasing price of energy combined with a significant loss of jobs and competitiveness will bring about more poverty. The population of rural areas will be particularly vulnerable. About 50% of the Bulgarians rely on wood for heating (Rangelova et al. 2021, 26), and if the price of energy sources reflects their carbon footprint, that cheap alternative to electricity will no longer be available.[7] (3) The plans of the European Commission to stimulate renovation by blocking the sales of buildings that do not comply with the standards of energy efficiency will deepen dispossession because it will turn the main asset of many families into a frozen capital which can lead to a rapid growth of unserviced credit. The renovation funds will be hardly able to remedy that, at least judging on the experience of the projects already implemented in the framework of the cohesion funds because the access to funding involves a substantial amount of latent costs. It does not seem plausible that families unable to afford healthcare would be able to spend on an energy passport, to register as a legally recognized entity, or to put time, effort and knowledge into applying for grants. (4) The Balkans are already an exporter of human capital. The official estimates suggest that between 1989 and 2011 more than 830.000 of the Bulgarian population emigrated (NSI 2014, 4), and after 2011 migration has not slowed down significantly (Stoyanova 2018); such estimates, however, do not take into account temporary migration.[8] A significant share of that export is unskilled labor. The combined effect of digital and green transition will limit the market of unskilled jobs in the EU, and the new jobs opened by the development of clean technologies will require skills that most migrant workers do not have. The unskilled temporary migrants will hardly have access to reskilling programs because it will be available for employees with a legal status that unskilled workers usually lack. More importantly, the new jobs will involve more intensive communication, including with machines, and hence they will require a digital and foreign language com-

[6] The experts insist that the costs can be covered by the funds that are currently used for direct or indirect subsidies for the coal power plants. That optimistic outlook however does not take into account that some of the power plants are owned by global companies enjoying long-term contracts with the National Electric Company, and if the companies choose to sue the government, a significant share of the subsidies will be used to compensate for their cost profits.

[7] After 1989 the energy companies minimized the outlays on maintenance and development of the electricity grid in the rural areas, and without a significant investment the population can simply lack access to enough electricity.

[8] 54.1% of the respondents in a 2017 survey on migration declared that they have worked more than 6 months in another European country (Kalfin 2018, 12). The money transfers of emigrants to their families in 2021 were 1168,8 mln. EUR and amounted to 76% of 1601,1 mln EUR the direct foreign investment in the country (BNB 2022).

petence the costs of which migrant workers cannot afford. Additionally, due to the increasing need to control the risks of unclean economic activities, the market of unskilled labor will be subject to regulations and monitoring that will increase the risks for both employers and workers. In effect, the cost of unskilled labor will decrease to reflect the increased cost of risks, and a large share of the market will recede into the gray zone of the economy thus leading to reduced employment, shrinking capital flows to the country and more poverty. (5) The Bulgarian industry is energy intensive. A significant increase in the energy prices will make it less competitive and cause an additional loss of jobs. The subsidies for clean technologies can compensate for that only to a limited extent because the Green Deal will generate a strong demand for clean technologies, and since the market of clean energy will be still emerging at the initial stages of the transition, it will have a limited effect on the competition; the choice of entrepreneurs where to develop and implement innovative technologies will be shaped by the access to subsidies, as the effects of the US Inflation Reduction Act are already demonstrating. Bulgaria will be hardly in a position to offer substantial subsidies, and the main, certainly lamentable advantages of the Bulgarian economy - cheap labor, cheap energy, weak regulations - will be immaterial. Even though some parts of the production will be outsourced to Southeastern Europe, the role of the region will be limited to manufacturing cogs for the engine of future European growth, and it will reap only a limited share of its benefits. (6) The increasing costs of energy will stimulate the development of a gray market of energy. The gray market will nevertheless produce a carbon footprint that will be detected by the European monitoring mechanisms and transformed into additional costs for the Bulgarian economy. The environmental risks of the gray market of energy will be further amplified by poverty driven pollution by old cars and wooden stoves that has been contributing to low air quality in the country in the last decades. If the European Commission responds to such excessive risks by the most used strategy – sanctions – instead of normalizing the risk, the EU intervention will be merely punishing the country with the additional effect of socializing losses while not threatening private gains. In effect, the individual consumers in the country will bear the costs of the risks of the transition exorcized from the green to the gray market. The risks of such a development are already discernible in a current investigation of the European Public Prosecutor's Office against nine coal power plants and an auditing company for a fraud which essentially consists in declaring false data about the carbon footprint in order to avoid buying greenhouse gas emission permits that the plants actually cannot afford (Nikolov 2023). Furthermore, the combination of uncompetitive industry and expensive energy will bring about more risks of failure, unemployment, poverty that will spill over into health and environmental risks. The region will become a point of condensation of excessive risks, a zone of ecological danger.

7.2.3. Ukraine, clean tech, and the violence of outsourcing

What kind of landscapes do these mechanisms produce? One of the less talked about consequences of Russia's invasion of Ukraine has been the reshuffling of the market for digital services in the East of Europe – an industry that is consistently hailed as an essential part of the Green Deal.

Ukraine has consistently been cast among the top outsourcing destinations in the region and in the whole of Europe with its cheap labor and a wide pool of educated IT specialists. Big companies like SAP, EPAM and Grammarly are struggling to pull out of the country and retain their cheap workforce in Eastern Europe. Ukraine is representative of a trend across the post-socialist region where

a new tech industry has grown out of outsourcing – an economic activity that is simultaneously affirming and challenging the postulates of transitional mechanisms.

Outsourcing, which has been hailed as a vehicle of foreign direct investment in Eastern Europe, creates uneasy dependencies between their low wages relative to the rest of Europe and the local aspirations for economic progress. Kalindi Vora (2015) argues that outsourcing is, at its core, an extractivist endeavor that turns certain populations into a source of vital energy for others, extracting "from areas of life depletion to areas of life enrichment."

These populations in the Third World and, increasingly, in the Second World, are seen as providing support, maintenance, and care labor for both customers and production facilities in the Global North.

7.2.4. Upskilling: a vehicle for the "green" transition

Outsourcing produces even within the context of national economies new geographies of life depletion and extreme income inequalities. In 2022 the median salary in Bulgaria's IT sector, an industry that had grown quickly on the back of outsourcing projects and enterprises, is around 2500 euro (Dimitrova 2022). In contrast, the minimum monthly wage is 350 euro and, according to one of the main trade unions, 2/3 of workers receive below the country median salary which is still three times lower than the median wage in IT (Petkova and Popova 2021).

Still, this increasing inequality is obscured behind the omnipresent rhetoric of human capital and high skilled labor in the European Green Deal as well as in national economic policies. The EU sees upskilling as a vehicle for the "green" transition – a vehicle that promises an unclear future for the ones whose jobs are deemed low skilled and which positions the Union in a new wave of extractivist politics: one that leans heavily on the extraction of biocapital from its peripheries and its outside. The ambition to attract migrants from so-called "third countries" to fill in high skilled jobs is clear in the programs of the EU and has been adopted by its members (Huckstep, Kenny and Dempster 2022).

In the first week of Russia's Ukraine invasion the Bulgarian Association of Software Companies quickly offered assistance for software engineers leaving Ukraine in an attempt to attract skilled labor to the country. Driven by the calculative logic of the political discourse of human capital, people in Ukraine, even in the context of war horror and cross-border solidarities, were seen through the lens of desirable skills. This logic reproduces the geographical inequalities of the European Union within the post-socialist space where the convergence of visa and labor regimes determined by the membership in the Union lead to multiple heterogeneous possibilities for the extraction and depletion of biocapital.

7.2.5. Reproducing or countering inequalities?

While the EU strategy for extracting skilled labor from third countries is explicitly clear, what remains unclear is the fate of low skilled workers. The strategy of the Union consistently promises an increase in the share of skilled jobs in various industries. But the existing practices of the Union suggest that its developmental policies privilege a capital-centric logic (Hristova 2021) that deepens

rifts between winners and losers. These policies have already nurtured and exploited the inequalities between East and West through the figure of a highly mobile low skilled labor force from the post-socialist space (Hristova and Apostolova 2021).

There are already anxieties about the geopolitical implications of the Green Deal with regards to trade and energy (Leonard et al. 2021), but the self-centeredness of this pan-EU strategy extends beyond fuel and trade. It exploits rather than attempting to mend the injustices and inequalities produced through the politico-economic projects of the East-European Transition and global colonialism (Truong 2021). The ambition to import skilled labor from the outside and consistently marginalize low-skilled workers is extractivist in its logic of absorbing productive labor power and outsourcing the cost and toil of its social reproduction to social and geographic peripheries.

Envisioning a shared sustainable future, we will need to search for alternative pasts and models that offer other frameworks relating to issues of environmental justice, ones that link together environmentalism, social reproduction, and popular sovereignty against the interests of extractivist capitalist policies. This is where the post-socialist experience provides important lessons – not just ones that are critical of the narrative of Transition but also examples of practices of popular environmentalism and a compendium of destitute spaces and broken lives that will need to be cared for and mended on the path to any meaningful transition to a better future.

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CONCLUSION

In "Multidisciplinary Studies in an Era of Automated Labor: Gender, Culture, and the Future of Democracy", we have diligently explored the multifaceted intersections between automated labour and significant societal structures such as gender, culture, and democracy. This book underscores the importance of adopting multidisciplinary approaches to fully grasp the complexities and nuances associated with these topics. By integrating diverse perspectives from history, sociology, gender studies, and political science, we have illuminated the profound impacts that automation brings to contemporary life, highlighting both the significant challenges and the promising opportunities it presents for future development.

The chapters in this book offer a comprehensive examination of the various dimensions affected by automation. From a historical analysis of postsocialist societies and their economic landscapes to a focused look at the perpetuation and transformation of gender inequalities in Greece, North Macedonia and Bulgaria, the narrative traverses significant socio-economic territories. We have delved into how cultural identities and practices are reshaped, and the evolving landscape of democratic engagement in the shadow of technological advancement. The postsocialist transition illustrates that access to public goods can be effectively limited by transforming governmental functions into market mechanisms. When public goods are commodified, those unable to bear the costs—whether financial, in terms of time, effort, or knowledge—are excluded. This exclusion is not seen as governmental discrimination because it is perceived as a result of the market's free and fair processes. Consequently, the social rights of these groups are not officially denied but become manifesto rights that lack enforceability. The market can further regulate and refine exclusion by providing differential access based on the varying levels of capital possessed by social actors.

As we conclude, this book calls for continued interdisciplinary research and proactive engagement to address the dynamic challenges posed by automation. The insights gained through this exploration underscore the necessity for academic, political, and cultural institutions to collaborate closely, sharing knowledge and developing responsive strategies that recognize and adapt to these profound changes. We invite researchers, policymakers, and societal leaders to harness the findings presented here, using them as a springboard for further inquiry and innovation, ensuring that the pathway to the future of work and democratic practice is equitable, sustainable, and richly informed by the lessons of the past and present.


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