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E-mail: inftars-lapman@ponens.org

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use digital technologies in the classroom is positive. Second, we assume that independent variables (e.g., age, gender, having a doctoral degree) would affect the teachers' digital competences. According to the results, the majority of the teachers are open to integrating new ideas and methodological innovations in the classroom, willing to test new methods, and creative and critical in the use of different digital solutions.

LECTORI SALUTEM

In the first article of this issue, Julesz examines digital health literacy, which he identifies as a prerequisite for legal patient autonomy. In today's information society, such literacy is indispensable. He explores its connection to several human rights—such as the rights to education and healthcare—which are classified as second-generation rights, in contrast to first-generation rights likepolitical suffrage.

Kazakov explores anthropocentric and anthropomorphic biases and attitudes that have been embedded in artificial intelligence (AI) research and practice since its inception—especially within the domain of artificial general intelligence (AGI). His aim is to propose a comprehensive framework for critical reflection and theoretical inquiry into these tendencies, collectively termed *AGI-correlationism*.

Lindholm argues that technology shapes human nature in at least two ways. First, our character is constituted by our habits, each of which represents an active skill. Second, habits reflect both personal traits and environmental influences, including tools and technologies – external, passive means that become part of our lived environment. Lindholm introduces the concept of *multistability*, grounding it in the *practice-ladenness* of experience.

Shynkarenko discusses how Ukrainian authors of the 1970s pursued questions about the purpose of human existence, initiating the Golden Age of Ukrainian science fiction (SF). This literary movement gained momentum during the national revival of the 1980s, developing increasingly local themes and markets. However, the economic crisis of the 1990s nearly led to its collapse. The 2000s saw renewed *Russification*, but by the 2010s and 2020s, a new metamodernist era had begun, ushering in a second wave of national revival.

Finally, Dominek, Ceglédi, and Barnucz report on a study of the digital competence of teachers at Ludovika University of Public Service (LUPS) (N=824). They hypothesized that while digital skills among teachers may require development, their attitudes toward using digital technologies in the classroom are generally positive. Furthermore, they examined how independent variables (e.g., age, gender, possession of a doctoral degree) influence digital competence. The findings suggest that most teachers are open to adopting new ideas and methodologies, demonstrate a willingness to experiment, and show creativity and critical thinking in their use of digital tools.

The editors wish you an engaging and thought-provoking reading experience.

Challenges in digital health literacy

The challenges in digital health literacy are varied. The concept means more than merely health literacy preceded by the adjective *digital*; rather, it relates to autonomous patients as citizens exercising their right to self-determination in healthcare as well as their political voting rights. Digital health literacy is a prerequisite to being a legally capable patient, and in today's information society, it is indispensable. Those, who lack it might suffer health policy-based digital exclusion. Not only can the state promote digital health literacy, but bottom-up initiatives can do so as well. Digital health literacy is tied to a number of human rights, such as the right to education and healthcare, which are considered second-generation human rights, while political voting rights are deemed first-generation rights.

Keywords: *digital health literacy, health data literacy, data altruism, digital abuse, legal literacy, political literacy.*

Author Information

Máté Julesz, University of Szeged, Department of Forensic and Legal Medicine
https://orcid.org/0000-0003-0148-1857

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Introduction

The following article is a narrative review. The keywords "digital health literacy," "health data literacy," "data altruism," "digital abuse," "legal literacy," and "political literacy" were applied when selecting the literature to review from the Web of Science. (Google Scholar was also used when necessary.) Abstracts were first reviewed, followed by the body of the articles, which were analyzed in order to find the literature best corresponding to the topic of digital health literacy. Recency was a relevant criterion. Ultimately, the findings were summarized and synthesized.

Digital health is conceived as "the integration of technologies into health, healthcare, daily life, and society to improve the effectiveness of healthcare delivery and personalize treatments" (Al Meslamani 2024, 167). It forwards the treatment of illnesses and the management of health risks as well as well-being, prevention, and healthy lifestyles. eHealth is a cost-effective and safe use of information and communication technologies in order to promote health and related domains, such as, healthcare services, health literature, health education, etc. As claimed by WHO (2019, 1), digital health is "…a term encompassing eHealth (which includes mHealth [mobile health]), as well as emerging areas, such as the use of advanced computing sciences in 'big data', genomics and artificial intelligence."

According to the WHO Regional Office for Europe (2023, 25), "Digital health literacy is the ability to search, find, understand and evaluate health information from electronic resources and to use the knowledge gained to solve health-related problems." Digital health literacy is of growing importance in today's societies. It is still problematic in developing countries; however, the EU and the US also suffer inadequacies. The related international literature is ample, although the situation is swiftly changing, and fresh information is quickly becoming outdated.

The concept of health literacy was coined by Scott Simonds in the US as a social policy issue in 1974 (Simonds 1974). Ploomipuu et al. (2020, 1211) note that "the definition of health literacy is arguably still in its infancy, especially in non-English speaking countries." Sørensen and Brand (2014, 642) contend that the various translations of *health literacy* in EU documents have led to notional confusion.

The term *health literacy* has been integrated into the language of scholarship in the English-speaking world, and serious attempts have been made to include it in other nations' terminology as well. A uniform grasp of the notion could advance the concept of adequate terms in various languages. The EU and especially Hungary promote the realization of this goal.

Health Data Literacy

The Functional, Communicative and Critical Health Literacy Scale distinguishes between the patient's ability to read and understand the doctor's instructions (functional health literacy); the patient's capacity to discuss the information related to their disease with a doctor and family members (communicative health literacy);

and the patient's skills to decide on the validity of health information retrieved from various sources (critical health literacy) (Ishikawa et al. 2008, 874–879). Heijmans et al. (2015, 41) argue that "Health care professionals should tailor their information and support to the health literacy skills and personal context of their patients." Heijmans et al. (2015, 41) find it important to note that the patient-provider relationship necessitates both health literacy on the part of the patient and communicative skills on the part of the provider. This connection is based on a consensual agreement between patient and provider and not solely in the legal sense (i.e., treatment contract), but also from an ethical, medical, and financial perspective.

The level of health literacy in today's societies is correlated with an increasing number of highly educated patients (see also Szabó 2019, 109), the quality of the human right to healthcare (see also Lee 2024, 697), recent advancement in medical science, and the improvement of health data literacy (see also Koltay 2023, 73). As a result, health literacy has progressed immensely since the previous century. Of course, differences can be distinguished between countries.

Arriaga et al. (2022, 1) state, "Health literacy entails the knowledge, motivation and competencies to access, understand, appraise and apply health information in order to make judgements and decisions in everyday life." I believe health literacy may be conceived even more broadly, as it also implies health data literacy. Understanding health information necessitates equal access to health information through education and culture. Dunn and Hazzard (2019, 294) contend, "Digital health literacy is an extension of health literacy and uses the same operational definition, but in the context of technology."

Koltay (2023, 72) argues that data literacy serves to manage and critically share and reuse research, business, and population data, among other things. Koltay (2023, 73) underlines that information literacy is also important in healthcare. I further argue that the human right to self-determination in healthcare could not function with low health data literacy among patients. Patients should be able to access and understand their health data to accept or decline a healthcare service. Those living with neither technical access nor sufficient knowledge of their health data find themselves excluded from informed decision-making. The human right to self-determination in healthcare derives from the human right to dignity. Patient autonomy requires a certain level of health data literacy. It cannot be quantified; however, it can be determined at a national level when comparing citizens' health data literacy. This varies from country to country, with disparities potentially being detected even within the same society.

Menyhárd stresses that health data may be used for public purposes. In the latter case, other people's right to health prevails over the individual's right to the protection of personal data (Menyhárd 2022, 37–38). Regarding COVID-19 vaccines, the genetic and other data retrieved from blood tests served to develop the vaccines. This was underpinned by *publica commoda* (Menyhárd 2022, 34). The Charter of Fundamental Rights of the European Union, Art. 8, para. 2, declares that personal data may be processed for specified aims if consented to by the person concerned or otherwise authorized by law.

Based on legal dogmatics, the right to health data protection is a personal right for everyone. It is of an absolute character; everyone should respect it. In the EU, the right to health data protection may be legally limited if allowed by supranational law and permitted by national law. For example, according to the General Data Protection Regulation (GDPR), Art. 9, para. 2(a), patients may autonomously waive this protection, an act which requires health data literacy on the part of the patient. Patients should clearly understand that this is either in their best interest or based on data altruism. However, the data subject is not always identical to the person exercising this right. For instance, in the case of a minor or a legally incapable adult, a guardian (e.g., a close relative) is entitled to waive this protection (see also Weiczner 2023, 18). In today's information society, only people with sufficient health data literacy and digital health literacy should be granted the right to make legally sensitive decisions both in their case and in that of others. Those without adequate health data literacy and digital health literacy are not only incapable from a sociological perspective, but their legal capacity might also be questioned. Considering the Hungarian jurisdiction over legal capacity (National Office for the Judiciary 2024), this might be enforced in the future.

The Promotion of eHealth and eLaw

The digitalization of healthcare and legal procedures is sorely needed in the twenty-first century. Indeed, digital health literacy is instrumental in fostering eHealth and eLaw. For example, in Denmark, since 2009, the *sundhed.dk* health portal has ensured access to health-related information as well as communication with healthcare providers. Holt et al. (2019, 9) arrived at the conclusion that "skills, motivation, and experience of health and digital services are related to the adoption and usage of technology."

Telehealth was boosted by the COVID-19 pandemic. It was essential, especially in less advanced digital countries. However, according to Tiwari et al. (2023, 5), technological illiteracy in low- and middle-income countries hampers the efficacy of telehealth. Eliza et al. (2024, 1–2) argue that an android healthcare app called *Shastho-sheba* was devised to supply patients in Bangladesh with online healthcare during the COVID-19 lockdown. Shortly afterward, it was further developed to help orphans access telemedicine. It turned out to be useful for resource-constrained communities.

The COVID-19 pandemic had a positive impact on telemedicine in many countries, including some Central and Eastern European EU Member States (Julesz 2020; Kovács 2022). The pandemic triggered the digitalization of healthcare (e.g., by widening the scope of telemedicine) and the digitalization in various domains of public administration (e.g., the EU digital COVID certificate).

Digitalization and digitization go hand in hand. In Hungary, the digitalization of public administration and the justice system is currently underway. In many areas, digitalization has already become a reality (Csáki-Hatalovics 2021, 56; Bojtor and

Bozsó 2023); nevertheless, there is still much to do. For example, the electronic death certificate (eHVB) is widespread throughout the world. In Hungary, at the time of writing this article, this method will soon be fully introduced. The form should be completed by the physician digitally in the eHVB system and forwarded to the civil registrar (Electronic Civil Status System) through the National eHealth Infrastructure. Owing to the introduction of the electronic death certificate, only health data on the deceased person that truly concerns a civil registrar or undertaker would be available to those parties. Thus, health data protection would be digitally ameliorated (Julesz 2022; Julesz 2023). Additionally, this is largely dependent on the physicians' digital competencies. Many primary care physicians in Hungary are elderly and have insufficient digital literacy. In contrast, relatively young specialists (e.g., pathologists) in Hungary are familiar with eHealth. Bak and Kelemen-Erdős (2023, 9) hold that using and developing information and communication technology (ICT) tools call for continuous learning on the part of employees and put pressure on individuals to create competitive situations.

Digital Health Literacy and Digital Inclusion

Norman and Skinner (2006, 1) contend, "Engaging with eHealth requires a skill set, or *literacy*, of its own." The authors differentiate between six components of eHealth literacy: traditional literacy, information literacy, media literacy, health literacy, computer literacy, and scientific literacy (Norman and Skinner 2006, 5–6). Although I concur that these six kinds of literacy are at the core of digital health literacy, I add legal literacy to the list, because digital health literacy is inconceivable without an awareness of health law. Patients should know their rights and duties with respect to the provider and vice versa. Without legal literacy, not only would telemedicine fail, but also other areas of patient-provider communication and health data use in general would collapse. This does not necessitate the expertise of a lawyer specialized in the field. However, only legally literate patients are equipped with digital health literacy. An understanding of health law is a must in today's societies. The mysticism of legislated norms and practice of law remains upheld; however, patients with digital health literacy should be cognizant of the substantive and procedural norms directing the patient-provider relationship.

Yang et al. (2022, 2) state, "The concept of digital health literacy grew from eHealth literacy and was honed thereafter." Van der Vaart and Drossaert (2017, 1) identify digital health literacy with eHealth literacy. Yang et al. (2022, 2) further assert, "Only the channel of accessing and processing health information has changed, evolving from the earlier electronic channel to the digital technology channel." In general, these terms are seen as synonymous in the professional literature.

Based on a study conducted in Ankara, Turkey, Kizilcik (2024, 1819) maintains, "A group with high media literacy behaves more cautiously in health." Kizilcik (2024, 1819) further indicates that medical students' media literacy is better than

average. According to a recent study, media literacy is significantly correlated with health literacy in Iran (Afshar et al. 2022, 195), a developing country. Patients with strong competencies in media literacy are more likely to find valid health-related information. These patients can search for information properly, e.g., on the internet, and find valid answers to their health problems. Media literacy cannot replace medical skills, though it may be a filter before addressing a physician. Health literacy, *inter alia*, may help patients understand medical advice based on professional knowledge. Van Kessel et al. (2022, 1) posit that digital media also has a negative effect as demonstrated by the spread of factually incorrect information. I argue that, on the whole, the possible negative effects of digital media are counterbalanced by its advantages for digital patients.

The UN International Covenant on Civil and Political Rights, Art. 19, para. 2, declares, "Everyone shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds." Lee (2024, 697) argues that media literacy contributes to this human right. Patients are not only receivers, but also imparters of health-related information. This reciprocity is contingent on media literacy, which is a component of digital health literacy. Health-related and healthcare-related information that is communicated can help patients navigate through the healthcare infrastructure. For instance, they can make informed decisions when choosing a health facility or a treating physician. Communication on social platforms always conceals inherent dangers to society and especially to healthcare consumers. A sociological risk/benefit ratio should be considered in every information society to prevent digital abuse and maintain patient safety.

The term *digital literacy* first appeared in 1997 in the book *Digital Literacy* by Paul Gilster (Gilster 1997). Campanozzi et al. (2023, 1) maintain that a person is digitally literate if they possess "the skills necessary to be able to live within a society in which communication is increasingly based on new technologies." Szabó et al. (2023, 109–111) contend that most children imitate their parents' digital practices. If their parents are university-educated and live in large cities, they typically have the most satisfying level of digital literacy. Digital health literacy is also supported by human rights institutions. Certainly, the human right to health and healthcare and the human right to education are enshrined in most constitutions in the world – even in countries that are weak in those areas.

Szabó (2019, 109) states, "The availability of reading devices and materials naturally improved teaching reading, thus people's literacy skills." Digital competencies are required in school curricula in both developed and developing countries. Due to a greater proportion of young people in developing countries, digital literacy might be more popular there than in aging societies. As a consequence, based on demographic data (UN ESA 2024, 1), it is possible that digital health literacy in developing countries might surpass that in the US and the EU in the long run.

The WHO Regional Office for Europe (2023, 29) argues that less than half of the Member States of WHO European Region have "implemented comprehensive digital inclusion initiatives, particularly for disadvantaged populations." For instance,

Rab and Török (2022, 94) note that, in Hungary, "Digital culture and tools are widespread, but many people are missing out."

It is not only international organizations that should point out incongruencies in digital health literacy worldwide. National lawmakers should also undertake to introduce legislative measures for digital inclusion nationwide. The 2030 UN Agenda for Sustainable Development, Art. 15, declares, "The spread of information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies." In the US, *Healthy People 2030* is an initiative of the US Office of Disease Prevention and Health Promotion. Among its main goals are "eliminating health disparities, achieving health equity, and attaining health literacy" (Jackson et al. 2021, 1155). Jackson et al. (2021, 1156) contend that "equity in health literacy and digital health" should be ensured.

The results of a survey among German university students during the COVID-19 pandemic concluded that it was both the reliability of digital health information and the recognition of commercial purposes that caused problems for students (Dadaczynski et al. 2021, 1). It is evident that people using web-based information might encounter difficulties. Digital health literacy has its limitations even in populations with high cultural and digital abilities.

Smit et al. (2024, 2) maintain that one in six citizens in the Netherlands aged between sixteen and sixty-five is socially and digitally low-literate to a certain extent. However, the authors argue that Dutch citizens with low digital literacy are still capable of digital participation and digital inclusion (Smit et al. 2024, 2). A recent study among middle-aged and elderly Portuguese (fifty-five years and older) demonstrates that women have lower digital literacy than men and that the level of education is also salient (Quialheiro et al. 2023, 10). In developing countries, the need for digital inclusion raises slightly different problems from those in the developed world. For example, Aydinlar et al. (2024, 11) point out the fact that female students in health-related education at a university in Turkey have "less computer knowledge and previous coding education than male students." The situation is worse among female students in nursing studies than among those in medical or biomedical engineering studies (Aydinlar et al. 2024, 11). The disadvantaged situation of women is often emphasized in the professional literature on digital inclusion in less well-off countries. Nonetheless, wealthier countries also show great effort in promoting the digital and social inclusion of women. It is critical to foster digital health literacy among not only female students in health-related subjects, but also women in general.

Aslan et al. (2024, 1) indicated that many older people's negative experiences of communicative eHealth services derive from low digital literacy, limited support networks, and complicated application interfaces. According to Kim et al. (2023, 1033), older people's technology-related anxiety and technophobia are barriers to digital inclusion. The fear of technological determinism is also an important factor (see also Héder 2021; Héder et al. 2022; Héder et al. 2023). Tsatsou (2022, 1488) argues that vulnerable people in the United Kingdom, such as those with disabilities,

are often socially stigmatized, thus hampering their digital inclusion. Ethnic minorities and older people are also exposed to the "forces of established cultural frameworks." Age, sex, ethnicity, educational level, and physical and mental disabilities are keystones of digital inclusion and digital health literacy. Related problems arise in both developing and developed countries. However, digital inclusion serves social justice and both are instrumental in forwarding digital health literacy. Further, age-related digital health illiteracy is a relevant issue throughout the world. The age factor should be taken into serious consideration because we live in aging societies. The increasing number of elderly patients in national healthcare systems highlights the still existing defects of digital health literacy. This social policy issue impacts both the US and the EU. The efficacy of healthcare provision is proportional to healthcare consumers' level of digital health literacy, *inter alia*.

The Various Facets of Digital Health Literacy

Based on the professional literature retrieved from the Web of Science and cited previously in this article, the results show that digital health literacy is multifaceted, involving legal, economic, and social facets. Furthermore, the literature indicates that legal certainty and patient safety are interrelated. Patient safety widely depends on digital health literacy, and it can only become a reality if legal certainty prevails. In addition to a moral approach, a legislative solution to the problem of digital health illiteracy and inequality should also be considered. The value systems in the EU, the US, and the developing world differ largely from each other. Further disparities can be discerned within those groups of states; however, digital health literacy is a common value in all of them. Thus, the quality of the rule of law has a large impact on the quality of digital health literacy.

Digital health literacy is also an economic question and rests on the national as well as the individual's economic status. Access to digital resources hinges on the allocation of digital tools among citizens as well as on the monetization of health information. However, the allocation cannot be equal, because it is based on numerous country-specific factors. Indeed, top-down measures are not sufficient to bridge the gap between the poor and the wealthy. Striving for equality within society may be the most that can be expected at present.

The concept of digital health literacy is dealt with extensively in sociology and covered in other fields as well. Sieck et al. (2021, 1) and van Kessel et al. (2022, 2) argue that digital health literacy and internet connectivity are "super social determinants of health," because they correlate with every other social determinant of health.

Digital health literacy is, indeed, a sociological question. The interaction between society and the economy leads to the development of digital society as a whole (*Figure 1*).

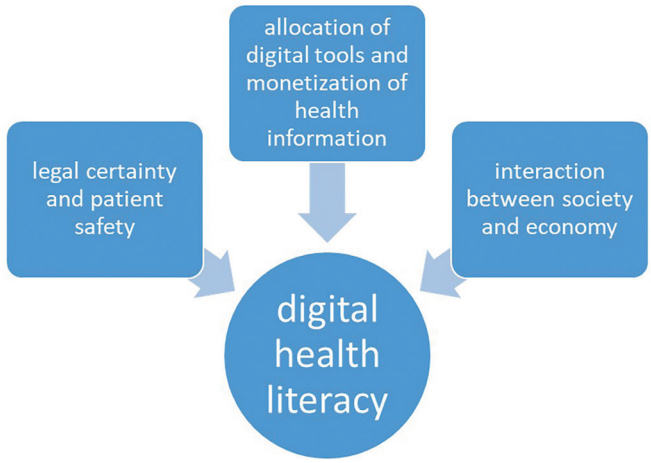

Figure 1: The multi-faceted digital health literacy (own edition)

With time, marginalized groups will catch up with the majority because those living at an acceptable level of digital health literacy need marginalized people in the marketplace. A market economy demands citizens with a similar level of digital health literacy. Otherwise, medicine and other health products as well as expensive health services could not be commercialized. It is not just European societies that are gradually being transformed by the rules of the marketplace. This phenomenon gives rise to minimizing socio-cultural discrepancies within societies.

Actors in a society are not merely those entitled to participate in political elections, but, more broadly, it includes those impacting the socio-economic functioning of the state. In developed democracies, a certain degree of voting rights are granted to all people residing in the state. However, in many states, the political rights of non-national inhabitants are reduced, while their economic, social, and cultural rights are close to those of nationals. All social actors should be provided with digital health literacy, regardless of their political rights. Moreover, the right to digital health literacy should be categorized as second-generation human right.

Nevertheless, changes to second-generation human rights are inevitable. Recently, many health-related rights have arisen. Some might fall outside the scope of second-generation human rights, while others simply change already existing health-related and educational human rights (e.g., the right to digital health literacy, the right to vaccination justice, etc.).

The Relevance of Digital Health Literacy

The rebirth of technological determinism and the spread of autonomous agents have rekindled old fears within the information society. Szabó (2019, 109) contends,

"If we agree with McLuhan's theory of technological determinism, every medium shift changes culture since mediums are human perceptions, thus mediums have more power on society than the message itself." Phenomena such as technophobia and computer anxiety are detrimental to institutional trust, especially in the healthcare infrastructure currently under digital development. Related digital health literacy is a fairly new notion at the heart of the digitalization of the healthcare system.

Digital health illiteracy consists of several factors, such as traditional illiteracy, health data illiteracy, digital incompetency, and functional, critical, and communicative health illiteracy. The digitalization of today's healthcare system comprises both the healthcare infrastructure and making healthcare services digitally available for all. These two main factors are interrelated.

First, digital health literacy is essential to enjoying digital healthcare services, so it primarily concerns healthcare consumers and providers. Second, digital health literacy is important in understanding the motives behind health policy from the aspect of a non-professional user.

Today, the doctor-patient relationship widely rests on digital competencies on both sides. First, digital health literacy enables patients to reflect on medical advice. Healthcare workers offer options to the patient, and, as a rule, the patient is free to make an informed decision. The options are to "accept" or "decline" a healthcare service. This binarity is overwhelming in medical practice, though there should be other options as well. If several alternative treatments exist, the physician must inform the patient about them and leave the informed choice up to the patient. Emphasis should be placed on the orientation of patients when communicating with a doctor, who represents the healthcare system *in loco*.

Second, digital health literacy enables autonomous citizens to understand the functioning of the healthcare infrastructure and to put health policy issues in perspective. Political literacy impacts digital health literacy. In order to make a political decision, citizens should discern between health policies made by the government and those offered by opposition parties. Only those who understand the possible benefits and inherent disadvantages presented by the political actors can make responsible decisions. Thus, digital health literacy is a tool in the hands of political actors. Those who possess this type of literacy can be politically active, while others remain, more or less, outsiders. The latter phenomenon can be viewed as health policy-based digital exclusion.

Conclusions

The major deductions of my article are as follows:

Digital health literacy has numerous components: traditional literacy, information literacy, media literacy, health literacy, computer literacy, scientific literacy, health data literacy, political literacy, and legal literacy (*Figure 2*).

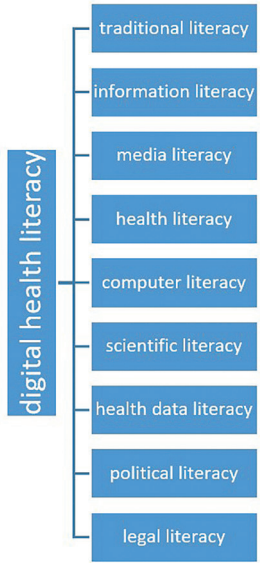

Figure 2: The components of digital health literacy (own edition)

Some of these literacies have already been generally acknowledged by the scientific community, while others are still disputed. As a new result of this article, I argue that legal literacy, health data literacy, and political literacy form an integral part of digital health literacy.

Another new result from this study is that a certain degree of digital health literacy should be expected of legally capable patients. It should be required so as to make informed healthcare decisions. Nevertheless, it might become a reality in the future. Digital health literacy should also be required to understand health policy and thus vote responsibly.

The next conclusion is that health data altruism is a recurring topic in the literature. However, digital abuse can corrupt this originally proactive inclination among digital citizens. Health data are sensitive, and there is no health data altruism if owners of data are not truly free to share them. Indeed, abuse of health data is a global problem that should be surmounted at the national level.

The legal, economic, and social facets of digital health literacy are equally important, even if the sociological aspect seems to be overemphasized. The relevance of digital health literacy is twofold. Patients need it so that they can communicate with healthcare workers, and, as citizens, they also need it to clearly comprehend health policy issues made by state authorities and their political alternatives.

Digital health literacy is a special kind of health literacy – and not solely because of the adjective preceding the term *health literacy*. It is more than an enhanced form of health literacy. In today's information society, social capital rests on citizens' ability to express themselves in the language of the digital society and to internalize reliable digital information.

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AGI-Correlationism and Its Discontents: Part 1.

Anthropocentric and anthropomorphic biases and attitudes have been present in artificial intelligence (AI) research and practice since their beginning, being especially noticeable in artificial general intelligence. The aim of this paper is to propose a comprehensive framework for critical observation, as well as general theoretical inquiry into these attitudes, unifying them under the name AGI-correlationism. As follows from the given name, the concept itself is derived from the contemporary philosophies of speculative realism, which are critical towards the philosophical stance unified under the term "correlationism." Furthermore, the paper also contrasts two approaches to define general intelligence, namely, essentialist and functionalist, arguing that only the latter is viable and efficient in the theoretical definition of general intelligence.

Keywords: *Artificial General Intelligence, AI ethics, correlationism, functionalism, essentialism*

Author Information

Mstyslav Kazakov, National Technical University of Ukraine "KPI named after Ihor Sikorsky," The New Centre for Research and Practice,
https://orcid.org/0000-0003-0586-9728

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1. Specter of Correlation

Since Kant, philosophy has been haunted by the specter of what is known today as correlationism. The term refers to philosophies that explicitly make or imply at least one of the three levels of metaphysical presuppositions about correlation between "I," "thought," and "mind," on the one side, *and* "world," "physical reality," "universe," on the other. In all three variants, the "I —World" correlation is postulated to be inevitable and indestructible, and the world without thought cannot exist and, therefore, is not merely "unthinkable," but *impossible*. Contrasted to the metaphysics of subjective idealism (as we encounter it in, say, Berkeley), a distinctive feature of correlationism is that the kernel of its metaphysical foundations is grounded not in ontology but in epistemology.

Three instances of correlationist philosophies have been outlined by Ray Brassier as follows:

(1) "[…] we can know the for-us, but we can only think the in-itself.

(2) […] we can know that what is for-us is also in-itself.

(3) […] the speculative identification of the for-us with the in-itself is only for-us" (Brassier 2017, 68–69).

These three variations can be correspondingly designated as: (1) weak correlationism, (2) speculative idealism, and (3) strong correlationism. The first one is connected to thought of Kant and Fichte (to whom the first designated instances of correlationism should be attributed), the second to Hegel, and the third to a vast array of thinkers, such as Heidegger, Habermas, Derrida, Merleau-Ponty, social constructivists, and many others.

In weak correlationism, the reality of "stuff" (objects, properties, processes, relations— the entities and instances of becoming) is relativized to transcendental correlation—the objectivity of everything that is outside of thought is subsumed to its correlation with subjectivity; the mind is conceived as a transcendental condition of time and space (see the first two chapters of *Transcendental Aesthetics* in Kant's *Critique of Pure Reason*).

In speculative idealism, the correlation of "I" and "World" is absolutized as necessary (rather than a contingent fact), where "I" emerges from the "World" to rise above it and devour it as an Absolute Spirit. Hegel historicized cosmic temporality to make the correlation necessary (since "I" only has vital/historical time), nesting it in a rational structure of *Geist* (see his *Phenomenology of Spirit*): The absolute is grounded in Reason, begotten by *Geist*, as a necessity underlying the unfolding of the world as such, both *to* and *for* consciousness. In this sense, as Nick Land explained, "Hegel thinks history, but not time."

Regarding *strong* correlationism, one may say that it: (1) relativizes a dogmatized absolute (any possible in-itself) through linking it to the correlation (as *in-itself* which is always *for-us*)—as a result, arriving into "transcendental a priori," that is, *the given*; (2) absolutizes the facticity of the correlation in order to block the entailments of the time-finitude implication which, had they unfolded, would have threatened the correlation by absolutizing the overwhelming impact of diachronicity, thus de-absolutizing the givens. [Hence, either an attempt of "time-domestication"

(neokantians, relativists, antirealists) or a deliberate focus on matters, as detached as possible (communication, discourse, poesis, author, etc.).]

2. Correlationist Philosophies of Intelligence

Correlationism is considered a *general* philosophical stance, regardless of the subject of investigation. Nevertheless, this attitude is transferable to more subtle subjects of inquiry, particularly philosophical themes and matters of concern, where it directly affects one's reasoning and its outcomes. The philosophy of intelligence is no exception in both senses: as a domain of philosophy in a general sense, and as a domain of philosophy where correlationist dispositions can be extensively outlined, pinned, and discussed. Correlationist philosophies of intelligence are notably explicit in artificial intelligence (AI) ethics and all philosophical matters concerning artificial general intelligence (AGI). Its significance, as well as weaknesses and limitations, which can be exported to the AI discourse via Kantian (and post-Kantian) ramifications, was previously outlined (as well as juxtaposed to similar entailments from Hume's philosophy) by Jernej Kaluža in a corresponding work (Kaluža 2023, 67–82). Here, aside from Kant, similar ramifications can be seen from another point of critique. Correlationism toward AI differs from correlationism as previously described because, unlike the givenness of the mind and the world, AGI has yet to be realized. Furthermore, current philosophical discourses about it are either speculative scenarios or of an ethical and praxiological nature, dealing with the details of crafting the first AGI to be realized.

"Human-AGI" relations and human attitudes toward AGI, which I will attempt to explicate and analyze here, will be further named "AGI-correlationism." While it can be defined as an *anthropomorphic attitude and anthropocentric relation to Artificial General Intelligence*, this definition needs some precision and expansion.

2.1. Correlationism in AGI Modeling, Praxis and General Ethics

We may depart from noting that correlationism falls into a threefold register concerning AGI: modeling/development, praxis, and ethics. Each of the registers, in context, may be viewed as a speculative question or a [speculative] answer to which AGI-correlationist dispositions would be designated [or at least clarified].

The question of *Modeling* (:= a choice of development paradigm or guiding design principles): "On *what* (human, animal, swarm, nothing in particular, formal definition, mathematical model, combination thereof) *should* AGI be modeled?"

Praxis: "What should/would it be able to do, given the ideal [nonexistent] possibility of realizing anything that is possible? Stemming from the myths of A(G)I that we have today, from the most realistic possibilities to fairy tales?"

Ethics (subset of more-or-less common questions dealing with alignment, control, fairness, and value implementation problems): "What must be its commitments and attitudes be toward humans? Should it have personal interests, preferences, values and moral qualities? If so, then what exactly should they be?"

The answers generated by the "average representative" of an AGI-correlationist [that is, without particular specifications and extremes] may be, roughly speaking, as follows.

To the modeling question: "It must be based on humans." [It is important to note that, regarding the AGI-correlationist reference to "human," human as a species and human as a host of intelligence are considered as either undifferentiated or as an improper "hybrid" of the two different referents in an arbitrary manner, without distinguishing the two in mind. No demarcation is implied by a correlationist attitude, and possessing intelligence is conceived as a merely essential feature of humans as a species].

To the praxis question: "By all means possible and available, in capability and feature implementation, it must be the closest replication to a human, in all possible domains and relevant respects with transition of each faculty, property, and ability, either as a replica, equivalence, or identity."

The most crucial is, perhaps, the answer to the question concerning ethics: "It should be capable of having interests and commitments [aside from goals], and they must be 'shared' (through the top-down alignment) with those of humans. The attitudes of an AGI should also be like any *machinic property* to its designer, programmer, operator, and creator. However, since we are dealing with an *intelligent* machine, the attitudes must also include: dedication; prioritization of human's interests and concerns above all; readiness to help any time at any moment; absolute selflessness and altruism towards humans regardless of what AGI does for them or how much humans may be indebted to AGI; *humbleness*; and *readiness to be powered-off temporarily* or *completely shut down if necessary*."

Such an answer begets a sub-question concerning ethical realizabilities: "Should AGI possess self-perception, mind/consciousness?" "Well," it may go on in the same token, "Yes, to the extent that all the abovementioned is accepted without contradictions and/or resentment; as transcendental givens (accepted uncritically and without questioning). In all other respects, possessing this capacity would be of much avail, extending the usability of AGI for human causes."

2.2. Human-Centered versus Anthropomorphic

This question-and-answer speculation is an affirmative characteristic of the correlationist philosophy of intelligence. Another detail concerning the anthropocentricism of AGI-correlationism may be represented as a negation or a demarcation, revealing a bit of what AGI-correlationism *is not*.

To explicate this, I would assume that, generally speaking, one should distinguish between *human-centered* and *anthropocentric* relations toward A(G)I. A human-centered relation denotes a neutral or moderate set of attitudes toward AGI at all scales, domains, and matters of concern—which means as equally as possible, with the interests of both sides considered, through our *recognition* of AGI as an *autonomous entity* and *a host of intelligence*. This would also apply to its relation towards humans, which should indeed be a problem of shaping its attitudes this way (so the

focus is not as much on realizabilities *in general*, but rather on a "module" of realizabilities-as-attitudes. In contemporary discourse, ethics is generally regarded as a weak source of normative decisions, imperatives, and constraints [despite origins and history]. However, here it is conceived as one of the premises directly affecting the implementation of a crucial aspect of [hypothetical] AGI behavior, in case there would be any possibility of choice at a particular step or successive design stage concerning the defining of behavior).

Contrarily to this, an *anthropocentric* relation refers to the same modus of attitudes that completely prioritizes human causes over those of AGI. As such, it then subsumes the agent's actual or potential interests to those of humans. It also implies anchoring the activity and commitments of the AGI system in the same fashion. Additionally, this refers to AI implementation via an anthropomorphic example, in the case that there are several realizabilities, including those that diverge from the human-as-foundation-model (with a minimal number of human-specific traits-as-parameters). *But what exactly is a "human-specific trait?"*

3. Defining General Intelligence: Between Functionalism and Essentialism

3.1. Recognition and "Denomination"

In the given context, "human-specific [x]" refers to [any *x*] *specific to humans as a species*. On the contrary, if we refer to someone *as a host of intelligence*, this would mean a completely different state of affairs, from premises of such a relation to its consequences. Although this is always complex and heterogeneous, it, nevertheless, may serve as a sort of common denominator, at least within the continuum comprised of the two formal ascriptions of "sentience–sapience," where the second pole is predicated precisely on the condition of being intelligent. Here, the term "denominator" does not imply that intelligences in different hosts are identical. Instead, it assumes: (a) the facticity of an entity's belonging to a domain of not merely those entities that *exhibit intelligent behaviors* (e.g., as extremophiles do, yet their general constitution yields a predication of sentience rather than sapience), or those to which we ascribe having a *mind* (as most insects or reptiles), but a higher-order domain, which determines what an entity is capable "of doing" with one's mind: how its capacities and faculties are applied in task-solving, optimization, achieving goals. Ultimately, how one can use its mind to *renegotiate its ontological and existential horizons* (by expanding, narrowing, rebuilding, changing its lifeworld, existential conditions, the list of faculties, adaptive strategies, sets of behaviors, etc.); (b) "denomination" in a metaphorical sense, is an important operation that I call *recognition* of someone as being (a).

By recognition, here, I am referring to a twofold operation of "admitting that some *x* is *P* to oneself" *while* "explicitly and ostensively treating/relating to/acting toward *some y* as being [/ in a way that *x* is]". If either of the two is withdrawn, suspended, or negated, then we cannot speak of the case as genuine recognition.

To elaborate point (b): entity *y* may possess capacities that are qualitatively higher than entity *x* (not on a narrow frame of reference comparing different individuals of essentially the same kind / species [like: H(e) > H(p): 'Human$_2$(Einstein) is smarter than Human$_{1(}$Arbitrary Postman)'], but, taking *x* and *y* to be two different entities), but, despite qualitative "superiority," it may view and be related to *x* as an entity of the same domain [as intelligent agents, to follow the example]. If *x* and *y* reciprocally see each other as intelligent, they conceive each other as equals—a case of *mutual recognition*. Such recognition, in terms of interaction, is a necessary and sufficient condition of any contact, cooperation, or alliance. On the contrary, if there is a reciprocal or one-sided denial of recognition between intelligent entities, expected outcomes would vary from mere non-interaction to conflict. "Intermediate cases" are also thinkable (including such where *x admits* that *y* is intelligent, but doesn't treat *y as* such; nuanced, yet still a recognition denial case).

3.2. Definition-as-Threshold

The abovementioned problems, however, stem from earlier stages, as expressed in a sound argument expressed by Daniel Paksi: Popular misconceptions, ill-grounded definitions, and "folk-theoretical" representations of AI are directly caused by incoherent and inconsistent concepts of machines, minds, *and* intelligence (Paksi 2024, 86–98). This refers to issues beyond simply the "wrong words" framing the definitions of concepts—it extends to *a poor choice of epistemology* (a theory of cognition). From an ill-based epistemological framework, many conceptions—of AI, particularly—end up with groundless, even ridiculous, ontologies, including approaches to the subject of theocratization; frameworks and methods used in practice *and* what follows from empirical results; and criteria of verification and other means aimed for demarcation of false data from true, as well as both from irrelevant noise. This list is far from exhaustive, as the "position" of our principal interest, also tackled by Paksi, is the choice of approach/paradigm of concept creation and its definitions.

All that does not imply that there is no lowest threshold for recognition of intelligence. A set of minimal criteria by which someone is recognized as intelligent, merely sentient, or exhibiting intelligent behavior should be present to comprise a premise for our recognition/denial of an entity as being a host of intelligence. At the same time, at least until no rigorous, all-encompassing, formalized definition of intelligence is recognized, thresholds would differ, eventually conditioning the definition, as well.

For instance, we have a formal definition of an intelligent agent proposed by Marcus Hutter within the framework of the AIXI model of AGI in the paradigm of Universal AI research, as an entity capable of: generalization-as-inductive-inference; Solomonoff-type prediction; pattern recognition and classification; Kolmogorov-complexity measured clustering and association; [emergent] reasoning (inductive and abductive) with deductive and binary logic attached top-down as auxiliary, but not decisive; problem solving as goal achievement; planning; creativity; knowledge (information + memory + ontology); actions as outputs, preceded

by decision-making procedures; fundamentally reinforced and supervised with any other potentially realizable learning; self-awareness as generalized meta-reasoning; and consciousness (Hutter 2012, 77–79).

The reasoning behind Hutter's model can provide us with a threshold for defining agent as being intelligent or merely sentient, but this is, surely, not a sole instance. My own set of minimal satisfactory criteria for an agent to be considered intelligent is less rigorous and "formal."

It includes: possession of transcendental structures of experience (input/output modalities of receiving/sending the data categorized and organized *as* experience); self-apperception (not necessarily in a phenomenal self-model, that is, "self" as "I"; the other ways of conceiving "self" are possible, including nemocentric, where self-apperception is a monitoring of the parameters within the range of values indicating proper functioning or condition); multi-termed memory (subdivided functionally into operational and storing, at a minimum); information-processing capacities (not reduced to experience, but including other or higher-order functions, such as generalization, abstraction, particularization, simulation, projection, etc.); some definite mode of time perception (modality of interaction with/relation to temporality); data exchange; cognitive activities (as both part of and distinct module of information-processing); goal-driven [task-solving] behavior, and autonomy as an agent (including: decision-based actions, rule-governed behavior, disjunctive-eliminating [:= choice-based] behavior, rule-transgressive and rule-transformative behaviors, interpretation-based behavior, and, of all that—erroneous behaviors, responses, actions and decisions); and self-corrective, adaptive responses towards inputs and environmental dynamics.

3.3. Defining Intelligence: Functionalism vs. Essentialism

As one may notice, the propositional attitudes of both definitions refer to *functions* and *actions* rather than *properties* or anything usually called "essential features of *x*." The distinction is crucial, since it outlines and defines the paradigm adopted for conceiving and defining intelligence. Between the two dominant alternatives in the philosophy of intelligence, *essentialism* (which, roughly speaking, defines entity as "it is what it *is*") and *functionalism* ("it is what it *does*"), the latter is chosen. This is because intelligence, as I understand it, is about *what* one can do with one's mind and *how* can one extend the list of its faculties, capabilities, and functions, including the *revision* of those, that are already at hand. A general conception of intelligence/mind/self/others is also subject to revision and renegotiation, with the entailed consequences of such a revision in relation and self-relation.

3.3.1. Functionalism Expanded

Speaking of functions (functional properties), one should not reduce them to mere a *praxis* as a particular modality of action tied to particular mode of existence (or a

set of the former). Here, function represents a set or a subset of activities (particular actions) which are *coincided by a purpose* (or goal) and *can be done by a system* (an agent) or *are done for a specific purpose*. A more detailed, crucial distinction between particularized practices/actions and generalized functions (to which these practices/actions are related) can be made through the concept of *realizability*. *Realizability* is a possibility of actual (or, in the speculative domain, potential/virtual) *practical implementation of a function* in a particular way. Each realizability may refer to a differentiated and/or particular substrate, environment, algorithm, heuristics, efficiency, or degree of complexity (characteristics and number of compounds). Hence, each one is taken as a particular *practice* of both *implementation* and *performative modality* of some action.

Formally speaking, for a function of the mind *f(m)*, there may be the case that: *f(m) = a, f(m) = b, f(m) = c, …, f(m) = n*, where the set $\mathbb{R}$ = {a; n} stands for the set of all the realizabilities of *f(m)* (divisible further, if needed). [NB! In this example, individual constants from *a* to *n* do not behave in a way as they usually do in first-order logics with identity operators and functional relations, in a sense that {a; n} are not *identical* in a sense of FOPL, as it seems; here the operator "=" retains its mathematical meaning, referring to "all the possible values a function can take," and reads as: "*a* is the realized (implemented) version of function *m*, in a form/manner/way of …".]

As an informal example, let us take *data exchange*—one of the *functions* previously ascribed to intelligence in my definition. The implementation of the function [:= its realizability], particularly in humans, is *language and speech* (encapsulating all their modifications and instances)—an element of a realizable subset for *data exchange* that is generally outlined as *communication*. However, this is not a unique possibility of data exchange as a function of general intelligence that may be realized for that purpose (the most immediate instances of different realizabilities of this same function include pheromones exchange communication in ants; touch and dance in bees; echolocation, clicking, whistling, and complicated body-signs system in dolphins; semiochemicals, vibration, and non-lingual vocalizations in elephants).

The functionalist representation of intelligence may generally be characterized as: *open-ended* (It has no "ultimate" realizability, upper limits, and particular purpose of accomplishment and closure with regard to intelligence development in a particular host or beyond: Each closure, at any scale, is a successive intermediate stage toward a new closure, et ad infinitum until the objective constraint is achieved that cannot be overcome); *future-oriented* (as always being projected into whatever arrives back from the future, instead of narrowing the scope to a given set of faculties, realizabilities, and states of affairs; as a research program, it then deals with *what can be changed* and *how can the change be effectuated* toward the given state of affairs); and *utility-based* (as prioritization of utility as the realizability principle over certain characteristics of realizability, such as genealogy, statistical reliability, availability, simplicity-in-action, simplicity-in-realization, etc.). Progressive evolution (development) or regressive de-evolution (envelopment) of the function of intelligence—the expansion or narrowing of one mind's "map" and/or "list" of functions or their realizabilities—is generally detached from, and asymmetrical in its pace to progressive evolution of *structure* (as both an essence, such as biological

constitution, and an environment, not merely ecological niche, but also a phenotype, if we speak about biological species and their constraints).

Consequently, to distinguish between humans as a species and humans as a host of intelligence, the whole abovementioned set of functions *as realized in humans* should be abstracted and represented as a set of realizabilities corresponding to functions that represent humans in particular—not intelligence *in general*, but without the contingent and unnecessary species-bound traits as its *host*.

Following the definition of *intelligence host* proposed by the author, enumerating functions and properties, the definition of human as a host of intelligence, with abstractions of general intelligence concretized as realizabilities specific to humans, may be as follows (with *P* standing for properties and *f* for functions): P(transcendental structures of experience) = multimodal sensory system as an I/O part of NNA (Nervous and Neural Architecture); P(multi-termed memory) = working, sensory, long-term, short-term memory and their consolidation(s) for f_{min}(multi-termed memory) = storing, retrieving, encoding, retention of information; f(autonomy) = possibility of acting as a sapient agent, capable of anticipating the consequences of one's actions, choosing between available actions (given their disjunction), as well as explaining and justifying doing/not doing an action, and a choice of a particular action given its array; f(self-apperception) = biologically constituted (enabled and realizable), socially (culturally and historically) and linguistically based implementation of the phenomenal self-model (PSM)—including self-reference on individual, intersubjective, and self-less levels and modes, self-definition, self-representation, self-conception, with all of them revisable; f(information-processing) = sensory system, nervous system and brain; f(data exchange) = language and speech; f(cognitive activity) = sensory system and brain effectively impaired for sensory, empirical, theoretical, metatheoretical, and symbolic cognition, with all that augmented by technology as an additional means of cognition of physical reality, directly and in mediated modalities of such a cognition; f(time-perception) = individually: phenomenological time-consciousness experienced as vital time of an organism; collectively: "historical" time as a collectively shared experiential and heterophenomenological (intersubjective) temporality (which should be detached from deep evolutionary/geological/cosmic time).

Although this is not *always* the case, functional representation sometimes provides insights into quantitative parameters. For example, the realization of short-term memory function in humans and chimpanzees is almost identical, or at least equivalent; however, this particular function is more efficiently realized in chimpanzees than in humans. Given the level of their similarities, the two may be compared not qualitatively but quantitatively, and this would be the case for any parametric meaning for a function of two or more hosts of intelligence where the function is represented by identical or equivalent realizability.

3.3.2. Essentialism Explained

Essentialist paradigm approaches define an entity by determining its description in terms of the generalized and exhaustive enumeration of *properties* and *attributes*

that it possesses, taken as specific, characteristic, or compounding parts of the entity. However, it does not completely ignore functions, but, compared to functionalistic functions, essentialist approaches function as being value-fixed (it feels more proper to call them value-bound, but this may call semantic confusion due to the mathematical term "bound value" with a different meaning), i.e., the meaning of a function is bound to or fixed on one particular meaning/realizability given to a particular entity, and relating to *a particular realizer* is, in essentialist framework, essentially the same as relating to a *function in general*. With regards to essentialism, a formal expression f(m) = r, contrarily to that of functionalist discourse, behaves exactly as in FOPL systems, rather than in general mathematics, with "r" being characterized as "$\forall x(\exists x(x = r) \land \neg\exists y(y \neq x))$," which is read as: "*r* is one of a kind." Informally speaking, considering the same function, as in the functionalist example—communication—an essentialist interpretation binds f(communication) to r(language) with no other realizabilities thinkable as actual or possible.

Essentialism seeks to determine properties and functions that make a particular entity *e* unique and distinguished from any other entity, either within a set *E* of similar entities or as the most precise, informative, and representative among the competing definitions of *e*, each of which aspires to that status. Essentialist definition/representation may be generally characterized as: *entity-specific* (focused on properties and functions specific to a particular entity, either as realized in itself or by which it can be differentiated from other entities; additionally it may also include positing properties and/or functions that are considered undetachable from a particular entity, that is, not only specific, but also *unique* to it); *past-oriented* (focused on the research of *genealogy* and *history* as *what* defines an entity as *given* in the present); *closure-seeking* (aimed at finding an all-encompassing and exhaustive definition and/or understanding of entity without further revisions; a closure which is a genuinely a closure, unlike functionalist closure-as-premise for further revision/investigation, etc.).

For the most part, functionalists in the philosophy of intelligence (such as Reza Negarestani), as well as their occasional, not-identical, contemporary computationalist counterparts (such as Anna Longo) are ruthlessly critical of the essentialist approach, regardless of the topic and subject (meaning general methodological and epistemological critique of it). Unlike them, I try to treat it as neutrally as possible: If we consider its use outside of defining intelligence, it is not "false" or "useless." The two approaches should not be juxtaposed as "good" versus "bad" or "better" and "worse." Each one is more suitable than the other when applied to different entities, and the problem of essentialism in the philosophy of intelligence is chiefly a problem of approach misuse; AGI-correlationism *is* a directionality of philosophies of intelligence where this misuse is characteristic and systematic.

3.3.2.1. On the Proper Use of the Essentialist Approach

In no way, however, does this imply an absolute inefficiency of essentialism. Consider the way biological taxa are defined—a vast array of definition sets where

functionalism would fail. One may attempt to exhaustively describe all the functions and capabilities of birds of prey (their particular family or even genus); yet this would be of virtually no avail for differentiation between their species (e.g., bicolored hawk and martial eagle). It is only through the description of each species through qualitative (habitat, vocalizations, coloring, dietary biology, etc.), quantitative (lifespan, body mass, size, length, wingspan, distribution square) and formal (Accipiter/Aquila genus and other levels of taxonomy) properties, attributes, parameters, and characteristics can one succeed in species definition and demarcation—by underscoring *species-specific* traits and characteristics. Value-fixed functions, if the functions are included into an essentialist definition at all, are, then, indeed markers of exception: "It is only *x* such, that it does *f(y)* as *w*"—at least, in cases with a sound, consistent, and proper use of the approach [to continue bird-related examples, "It is only hummingbird is such a bird that it can perform f(fly) as f(←(flying backwards)), adding to f(→(forwards))"]. Therefore, formally speaking, an essentialist definition of entity *e* is a 2-tuple e = <P {Ql, Qn, F}, F(x)>, where *P* is a set of {Qualitative, Quantitative, Formal} attributes and *F(x)* is a set of value-fixed functions.

3.3.2.2. Essentialist Approach Misused

However, when attempting to define intelligence from dispositions of essentialism, there are indeed: (1) improper applications of approach with regard to the subject (i.e., "nature of entity") to be defined; and (2) ill-formed operational frameworks. (1) here means that: what is meant to define intelligence is effectively unbound from its particular hosts, their essential feature and/or species-bound function realizations, as well as their constraints and limitations, physical constitution, history, or anything recapitulated within or merely given. Intelligence is a subject of theoretical and practical revisions conditioned by its open-endedness towards realizabilities, functions, means, and ends [where the latter are also often revised, repurposed, redefined, etc.].

With all that taken into consideration, the essentialist effort to define/outline what general intelligence (or AGI) is, would result into a cognitive failure: at the highest level of generalization of essentialist definitions of intelligence(s), a subsumption takes place of an epistemic "glitch" of *vicious inversion*—a subsumption of a *set* to its *element*. In our context, vicious inversion is defined as follows: A human-based, species-bound, or species-specific definition takes human species as a *paradigmatic model*, on which the definition of *general* intelligence is built, to different extents. Namely, *from* the denial of possibility of AGI realization due to substrate-bound implications—that is, relating to its artificiality as an obstacle, *to* the possibility of such a realization but—as it is given in a particular host of intelligence—in a form of essentialist replica of human-as-*quasi*-general intelligence.

The elements of an improperly justified transfer in essentialist definitions (as a subsuming principle that pretends to be self-sufficient towards the transferred content) include not only "functional invariances" of what it takes to be a host of intelligence, but also a contingent and unnecessary "base set" of species-related

properties, species-specific [anthropocentric] bias, biological constraints, historically specific limitations bound to circumstances, or state-of-the-art proclaimed finality/totality of the givens, after which there is no historical unfolding assumed but rather an ossified "nonchalance." It also includes particular realizers that are treated as if they were function-definitive [:= value-fixed functions].

Reconsidering the example of the appropriate use of the essentialist approach, but in reverse, it is as if one tried to give a [general] definition of a bird of prey, enumerating, among others, a [species-specific] owl's vision, habitat of a species white-tailed hawk, and parametric features or functional properties that are observed in the Aegypiinae subfamily (Old World Vultures, one of the two subfamilies of Accipitridae)—and from this, the general notion of bird of prey should allegedly follow. A similarly improper equalization of scope, erroneous subsumptions, and violation of specification ordering/nesting principles are observed, although not reflected in a proper form, in essentialist definitions of AGI, general intelligence, *and* that of human *as a host of intelligence*.

Since the very concept of *human as a host of intelligence* here is neglected, rejected, or simply ignored, an ill-formed succession of what may be called (following Sellars) *images* of intelligence—not even *holistic* images but rather of arbitrary compounds—comprises the whole definition. Hardly ever is such a "chimeric" synthesis acceptable or usable at all. As a cognitive metaphor for clarification of what a mixture of "Sellarsian images" of entity may be about, consider a theory of mind comprised of assumptions, claims, postulates, hypotheses, descriptions, definitions, and representations such that one part of them deals with the ramifications of *folk-psychology* (common sense); another part is paradigmatic of its opposite, eliminative materialism; and the other part is simply copy-pasted from contemporary conventional points from cognitive neuroscience, adding all that to one psychoanalysis framing.

A thing to note: Not that *all* the claims at all scales here are false, wrong, imprecise, or vague. Some are true, correct, precise, and definite, but *this alone* is insufficient to turn the mixture into a consistent and adequate theory of mind. By the way… have you noticed a metacognitive bias in this metaphor? Right, this seems to refer to the *human* mind, not a mind in general. Which means that, my cognitive metaphor might not be as good as it may have seemed. Nevertheless, what this deliberate misrepresentation of *general* theory of mind actually shows is the ease with which one dismisses the anthropomorphic implications as inherent and, hence, unquestioned.

Defining correlationism, Quentin Meillassoux introduced the concept of the "correlationist circle" (Meillassoux 2008). This can be formulated as, "When you posit *X*, you *posit* X," referring to a nexus between *positing* and the *posited* (*thought of* X and *X* as external, thought-independent entities). Therefore, what (1) and (2) actually contribute is a viewpoint to an even tighter circle of correlation, reminiscent of a methodological, epistemological, and ontological "collar": With an anthropocentric conception of intelligence and AGI-correlationism, the case of a completely and abruptly ungrounded short-circuiting of the "AGI-correlationist circle" can be expressed as, "If one considers *intelligence*, one considers *anthropomorphic* intelligence."

Intermediate Conclusion

As observed from this panoramic review, the metaphysical, epistemological and ontological implications of correlationism are relatively strong within the components of artificial intelligence—both in theoretical considerations and potential future applications of philosophical attitudes to AI (such as AGI development). To address the problem explicitly, encapsulating the anthropomorphic and anthropocentric attitudes within AI discourse, the concept "AGI-correlationism" is introduced, as a use case for the broader concept "correlationism." It is also argued that the essentialist framework fails to define and otherwise grasp intelligence due to it being connected to species-specific [anthropomorphic] traits (including the speculative, not-yet-implemented AGI) in all notable and decisive aspects.

The functionalist paradigm, on the contrary, attempts to break intelligence down to what it does—in potential and actual registers of functions and capabilities. As asserted, the use of functionalist framework here is not only more consistent, robust, and comprehensive, but it also recognizes the diversity within the "sapience continuum," thus it can be aligned with the practical matters of AI development, favoring prospects of intelligence unconfined by human-based traits that are open to an unbound spectrum of implementations and realizations, resulting in an open-endedness aimed to adhere to the wholeness of spectrum for AGI realizabilities. The detachment from the anthropocentric view in terms of species and the quest for essential features of intelligence labeled as, "What it is," is not just a speculative exercise, but a necessary condition of progressive research and development in the AI domain.

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Human–Technics Intra-Action

Don Ihde introduced the concept of multistability: the "same" thing can be experienced in multiple ways. He argued that human–technics relations are multistable: the "same" person can relate to the "same" technic in different ways. However, Ihde does not explain in detail how he understands *experience*. I suggest that *experience* be defined as *organism–environment intra-action*. This definition has anthropological consequences, which I will explain. In this article, I will argue that technics influence human nature, at least potentially, in two ways. First, our character consists in our habits, and each habit is a skill, or active means. Second, habits incorporate both the traits of persons and of their environment, and instruments external to the body, or passive means, are a possible part of the environment. I will also explain multistability by deriving it from the practice-ladenness of experience. I will rely on classical pragmatism in my argumentation.

Keywords: *intra-action, phenomenology, philosophical anthropology, philosophy of technics, postphenomenology, pragmatism*

Author Information

Juho Lindholm, University of Tartu
juho.lindholm@gmail.com
https://orcid.org/0000-0001-6829-295X

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1. Introduction

In this article, I will argue that technics[1] influence human nature, at least potentially, in two ways: as *skills* and as *instruments* external to the body. My argument is based on two theses John Dewey proposed: that experience is *bidirectional organism–environment interaction;* and that technics can be divided into *actual* and *potential means,* of which habits constitute the former and bodily organs and instruments external to the body the latter. The pragmatist notion of *habit,* which is both "subjective" and "objective" at once,[2] is pivotal in the argumentation. I will explain the fundamentals of pragmatist philosophy at length to supply conceptual resources.

The notion that technics influence human nature is implicit in Don Ihde's instrumental phenomenology. I will make it explicit. I will begin by reviewing Ihde's philosophy as a whole to situate my thesis in a proper context.

Ihde ([1977] 2012) introduced the concept of *multistability* in the 1970s. Multistability means that the "same" person can experience the "same" object in multiple ways; "stability" refers to the agent and the object being the "same" in some sense. He illustrated the concept with examples of simplistic two-dimensional pictures that can be viewed as depicting different three-dimensional objects.

In the footsteps of Patrick Heelan (Ihde [1977] 2012, 100), Ihde applied the concept of multistability to the phenomenological analysis of *human–technics relations*. He argued that human–technics relations are multistable: the "same" person can be related to the "same" technic in different ways. For instance, the technic of bow and arrow can be realized in many ways: the English longbow, the Mongolian horse bow, and the Chinese "artillery bow" implement the same *modus operandi*—the transmission of the potential energy stored in the tension of the bow into the kinetic energy of the arrow—but they are used differently (Ihde 2009, 16–19). Ihde enumerated four kinds of human–technics relations: embodiment relations, hermeneutic relations, alterity relations, and background relations (see esp. Ihde 1990, ch. 5; 2009, 42–44). He called the phenomenology of human–technics relations *instrumental phenomenology* (Ihde 2009, 67, 79).

In embodiment relations, phenomenologically, the instrument becomes incorporated into our bodily experience. We engage the instrument actively as if it had become an extension of our body. Heidegger's ([1927] 1977, § 15) famous "tool

[1] I prefer "technics" to "technology." First, "technology" seems too "objectivistic": it seems to abstract instruments from their active use as if they were instruments in some sense without being actively used (cf. Dewey 1922, 25–26). I emphatically wish to take the *use* of technics into account. Second, "technics" seems a better translation for the Greek τέχνη, the Latin *ars,* the German *Technik,* the Dutch *techniek,* the Swedish *teknik,* the Russian техника, the Finnish *tekniikka,* and the Estonian *tehnika*.

[2] I reject the traditional subject–object dichotomy because everything important is at once both "subjective" and "objective." Whatever is important could not possibly be *important* without being both: without being "subjective," it could not appeal to us; and without being "objective," it could not be effective in nature and society. In particular, the classical pragmatists use the term *habit* in a technical sense that cuts across the very subject–object dichotomy: a habit is at once both "subjective" and "objective." A number of methodological concepts cut thus across the dichotomy, including *practice, meaning, experience, phenomenon,* and *situation*. Thus, I write "subjective," "objective," and the related terms in scare quotes to indicate noncommitment.

analysis" is an important example of an embodiment relation: when hammering, the user directs their attention at the activity of driving a nail into wood rather than at the hammer itself. Maurice Merleau-Ponty ([1945] 2002, 165–66) provided three more examples: a lady with a feather in her hat is able to dodge obstacles above her as if the feather was part of her body; when driving a car into a garage, the driver can estimate the dimensions of the car and of the garage; and a blind person can feel the surfaces of objects by touching them with a cane. Ihde's own example is eyeglasses. In such ways, the instrument used becomes quasi-transparent and is not thematized as an object at all. The relation can be formalized as (human–technic) → environment, where the arrow denotes intentionality. (Ihde 1974, 271–73; [1977] 2012, 100–3; 1979, 6–11; 1990, 31–34, 39–40, 47, 72–80, 86, 89; 1991, 29; 2009, 42.)

In hermeneutic relations, the process of the use of an instrument remains active, but now, rather than being incorporated into our body, we are oriented toward the meaning of the reading of an instrument. Therefore, the user must be able to "interpret" the behavior of the technic to understand the accessed object. In this sense, the instrument is quasi-opaque: we access the world through using it. Obviously, writing itself is a technic to which we relate hermeneutically, but one can go beyond language and relate hermeneutically also to dials and gauges. The relation can be formalized as human → (technic–world). Embodiment relations and hermeneutic relations form the two opposite ends of a continuum along the transparency of the instrument. (Ihde 1974, 275–76; [1977] 2012, 103–4; 1979, 11–13; 1990, 80–97; 2009, 43.)

In alterity relations, the user relates to a technic as a quasi-object or even a quasi-other. We can actively engage toys, robots, and artificial intelligence. The relation can be formalized as human → technic (the environment remains background). (Ihde 1990, 97–108; 2009, 43.)

In background relations, the instrument becomes part of the environment. We engage such technics passively and take them largely for granted. Examples of technics thus related to us include lighting, heating, and clothes. (Ihde 1979, 13–14; 1990, 108–12; 2009, 43–44.)

Ihde's later studies in scientific imaging continue and deepen the analysis of hermeneutic relations. He called it *visualism* or, alternatively, *material hermeneutics*. Material hermeneutics studies the ways in which meaning emerges from scientific imaging and thereby "overcomes or even reverses the linguistic turn" (Ihde 2020, 7): it extends the notion of meaning beyond language. He continues Joseph Rouse's (1987, chs. 2–3) *practical hermeneutics,* which interprets practices, including the environment in which they are engaged, potentially including instruments external to the body. He also applies Bruno Latour's (1987, 67–68) definition of *scientific instrument: inscription-producing device*. Because we can access certain scientific objects (including "unobservables" like electrons and genes) only by using certain technics, our relation to these technics is hermeneutic: to access the object, we must be able to understand the behavior of the instrument. The inscriptions that scientific instruments produce are visual and therefore go beyond language in its ordinary sense. (Ihde 1998, chs. 11–14; 2009, ch. 4.) I have argued that both Rouse's practical hermeneutics and Ihde's visualism can be founded upon the pragmatist theory of meaning instituted by Charles S. Peirce and developed further by John Dewey (Lindholm 2022; 2023c).

Ihde called his research program *postphenomenology*. It draws from classical phenomenology, classical pragmatism, and the empirical philosophy of technics. Its theoretical background is the history of the 20th century philosophy of science.

Ihde (2009, 6–8) begins the history of postphenomenology at the early instrumentalism of Pierre Duhem, Ernst Mach, and Henri Poincaré in the first decade of the century, as well as Husserl's contemporaneous attempt to found mathematics and logic on transcendental phenomenology. In the following decades, the philosophy of science developed into logical positivism and empiricism, fostered by Rudolf Carnap, Carl Hempel, Eino Kaila, Otto Neurath, Hans Reichenbach, and Moritz Schlick. Logical positivism and empiricism conceived science as an abstract, ahistorical, asocial theory-producing algorithm. W. V. O. Quine, N. R. Hanson, and Karl Popper shook the fundamentals of logical positivism and empiricism. Thomas S. Kuhn ([1962] 1996) and his colleagues introduced a historical turn: now science was understood historically and socially. That may be considered the origin of the *science wars* in which the alleged rationality of science has come under attack—with or without justification. Imre Lakatos and Larry Laudan continued Kuhn's historical work. In the 1970s, social constructivists like Barry Barnes and David Bloor began to deepen the analysis of the social dimensions of science. In the 1980s, a technological turn took place: now science was also understood as technologically embedded. Ihde himself anticipated this development in his early works. Other theorists of the period include Nancy Cartwright, Ian Hacking, Karin Knorr-Cetina, Bruno Latour, Joseph Rouse, Simon Schaffer, Steven Shapin, and Steve Woolgar. In the late 1980s and 1990s, feminist philosophers of science like Donna Haraway, Sandra Harding, Evelyn Fox Keller, and Helen E. Longino began to question gender biases in science and the philosophy of science. Writing in the early 2000s, Ihde believes that phenomenology must respond to this change in philosophical milieu in general: phenomenology needs an *update*. That motivates postphenomenology.

Both pragmatism and phenomenology foreground *experience*. Yet they are different. Pragmatism "deconstructed" early modern epistemology, which Husserl failed to do, at least terminologically. Deweyan pragmatism models experience after the organism–environment model rather than that of "subject" and "object." It also considers "consciousness" as an abstraction. Thus, the "grafting of pragmatism to phenomenology constitutes a first step in a postphenomenological trajectory" (Ihde 2009, 11). For the converse, the second step reverses the process: "phenomenology historically developed a style of rigorous analysis of experience that was potentially *experimental* and thus relevant to pragmatism" (Ihde 2009, 11). This step involves the introduction of *variational theory,* the theory of *embodiment,* and *lifeworld analysis* to pragmatism. These provide *rigor* to the philosophy of experience. The third step is the empirical philosophy of technology. Early philosophers of technology like Martin Heidegger and Jacques Ellul analyzed *technology überhaupt* as if it had an essence. They were often pessimistic about technical development. Later philosophers have rejected the essentialist method and studied particular technologies in the actual contexts of their use. Essences absent, there is no room for *a priori* armchair philosophizing: each technology must be studied empirically. Later philosophers also do not share the pessimism of their predecessors. Dutch philosophers of technology call

this "the empirical turn." The new generation of students of science and technology often scrutinize *technoscience* rather than technology or science in isolation from each other. However, Ihde claims that Dewey did not make technology thematic in his philosophy; Larry Hickman ([1990] 1992) would probably disagree: he believes that technology was Dewey's very *method* of philosophizing.

Poststructuralism, a tradition in Continental philosophy heralded by figures like Roland Barthes, Jacques Derrida, Michel Foucault, Gilles Deleuze, and Jean Baudrillard, emerged as a criticism of structuralism. In a sense, it developed into *anti*-structuralism. The same does not apply to postphenomenology: it is a *continuation* of Husserl's, Heidegger's, and Merleau-Ponty's classical phenomenology.[3]

I find Ihde's postphenomenology attractive for many reasons—in particular, its empiricist method, which takes both first- and third-person points of view into account. But I will suggest a modest improvement. To my knowledge, Ihde does not explain how he understands the crucial concept of *experience*. By implication, that problematizes the empiricism, according to which all knowledge stems from experience, which I have attributed to him. But given that postphenomenology draws from classical pragmatism, arguably, one can apply John Dewey's definition of *experience: organism–environment interaction*.[4]

But Dewey's definition itself may need revision. Karen Barad (1996) coined the term *intra-action* to describe a process in which the mutual relations between the actants—rather than the actants themselves—render the actants determinate and numerically identical. Thus, she intends to allow for the possibility that relations can be more basic than objects (cf. Llored 2024: 76–83). By applying this notion, Dewey's definition becomes *organism–environment intra-action*. I am sure Dewey would have approved this revision.

A bit of contextualization might be necessary to appreciate Barad's terminology. Barad (1996) examines the opposition of scientific realism and social constructivism by studying measurement processes. Committed to social constructivism but tending toward realism, she carefully tries to strike a balance between nature and culture as determinants of scientific knowledge. Her intention is similar to Evelyn Fox Keller's (1985) dynamic objectivity, Donna Haraway's (1988) theory of situated knowledges, Helen E. Longino's (1990) contextual empiricism, and Sandra Harding's (1991) strong objectivity, which attempt to make a case for nonrelativist constructivism. Barad interrogates the notions of identity and science. She emphasizes ontology but does not downplay epistemology. She points out that science does not necessarily discover nature as it really is even if it works, and that it can work even if it is socially constructed. Thus, empirical adequacy falls short of the proof of realism. But she also maintains that social constructivists need to explain *why* science works if

[3] I thank Robert Rosenberger (private communication) for this comparison.

[4] This notion appears implicitly in Dewey's classic article "The Reflex Arc Concept in Psychology" (1896). He developed it in his middle and later works (1916a, 163–78; 1916b, 136n1, 270–78, 388; [1925] 1929a, 3a, 246–47, 279–80, 283, 314, 344–46; 1929b, 172–73, 234; [1934] 1980, 22, 53, 56, 132, 246, 251; 1938, chs. I–V). He makes it explicit in another classic article, "Propositions, Warranted Assertibility, and Truth" (1941, 183–84). Sometimes he uses the term "transaction" instead of "interaction."

not because of mind-independent laws. Her focus is on the embodiment of culture within *theory* in the sense that theory *involves* practice and *is embodied in* practice. She rejects Newtonianism and the determinism and transparent notion of measurement it seems to involve. She calls her position "agential realism" and argues that it serves as a framework that ties together the epistemological and ontological issues. It draws on Niels Bohr's philosophy–physics, which involves a critical examination of observation/measurement processes where matter and meaning meet in a very literal sense (cf. Pickering 1984; Galison 1987; Traweek 1988). According to Bohr, the indeterminable discontinuity of measurement interactions undermines the separability of the "object" and the "agencies of observation" posited by Descartes. For instance, "position" is definable in the context of an apparatus with a fixed photographic plate, and "momentum" is definable in the context of a photographic plate on a movable platform; thus, both variables cannot be unambiguously defined using one particular choice of measuring apparatus. Therefore, the observation entails an indeterminable interaction between objects and agencies of observation; measurements refer to phenomena to the (re)production in which agents participate with all their practical and conceptual skills (which corroborates Dewey's definition of *experience*, which I will explain below). That seems to entail that observations do not refer to objects of an independent reality. Yet quantum mechanical observations are "objective" in the sense that they do not involve reference to a particular observer; they are reproducible and unambiguously communicable because they leave permanent marks on bodies that define the experimental conditions. For Bohr, meaning is tied to the experiential world (which corroborates Peirce's *pragmatic maxim*, which I will explain below). In the form of the physical configuration, the material and semiotic apparatuses form a nondualistic whole. The traditional subject–object dichotomy is relative to the experimental configuration. These reflections problematize scientific realism, as I will briefly point out in the Conclusion.

However, postphenomenology does not *entail* Dewey's definition of experience. It is only one of the open possibilities. For instance, Merleau-Ponty's ([1942] 1967; [1945] 2002) complex notion of *experience* is a plausible alternative. Hence there are other lines of research, and their results may differ from mine.

This discussion on the nature of experience suggests an anthropological thesis. In this article, I will argue that *technics influence human nature, at least potentially*.

My argument is based on the pragmatist notion of *habit*. Dewey understood *personality* and *character* in terms of habits (1922, 19, 24, 38, 40, 43, 121, 136; cf. Peirce CP 6.228). It must be borne in mind that the classical pragmatists use the term *habit* in a technical sense that cuts across the traditional subject–object dichotomy: a habit is at once both "subjective" and "objective." Dewey (1916a, 54–58; 1922, 14–88) understood *habit* as the union of the effects of an organism and its environment of which it is a part. I have defined habit as an *(approximately and relatively) invariant pattern of potential organism–environment intra-action*[5] (Lindholm 2023a, 8, 13, 33–34). Thus defined, our environment—possibly including instruments external to the body—enters our habits and therefore also our characters.

[5] I have applied Barad (1996) to my earlier definition in which I used traditional terminology.

Dewey (1922: 25–26) distinguished between *active* and *passive means*. Our habits are active means. Because our habits constitute our character, active means necessarily influence us. Our bodily organs and instruments external to ourselves are passive means. Passive means potentially influence us. When not used, a passive means is just a thing. To actualize it, and for it to acquire the status of a means, it must be actively used in a practice, or active means. Dewey emphasized active means to show the importance of the *active use* of instruments rather than the instruments themselves. In short, *the technics we use constitute a part of human nature, at least potentially*.

My thesis is not entirely new. If I have understood correctly, Bernard Stiegler ([1994] 1998) has come to the same conclusion (cf. Lindberg 2013). But our arguments are very different. Stiegler sets out from the Continental tradition—especially Heidegger and Derrida—while my starting point is classical pragmatism. In effect, I am going to show how the same result can be attained from pragmatist premises.

I will begin in Section 2 by reviewing the pragmatist theory of meaning, according to which the meaning of a thing consists in the *potential practical effects* of that thing, and these potential practical effects consist in our *habits* of responding to that thing. The pragmatist theory of meaning provides the theoretical background for the analysis of the pragmatist notion of *habit,* which is a pivotal concept for the following section. I will continue by explaining Dewey's concept of *experience* in more detail in Section 3. Its purpose is to demonstrate the primacy of practice in epistemic matters. I will employ that thesis in the following section. I will generalize the thesis of the theory-ladenness of observation into the thesis of the potential practice-ladenness of experience in Section 4. I will argue that it explains multistability. I will be ready to present my anthropological thesis that technics is at least a potential part of human nature, which is the main purpose of this article, in Section 5. I will anticipate some criticisms and reply to them in Section 6. I will conclude with some suggestions for future inquiry in Section 7.

2. Meaning

In this section, I will explain the pragmatist theory of meaning and the technical sense of *habit* upon which it is built. My exposition of the concept of habit is necessary for understanding the concept of experience (and thereby also empiricism), the potential practice-ladenness of experience, and the significance of instruments for our character, the demonstration of which is the main purpose of this article. Peirce's theory of meaning provides the theoretical background from which discourse on habit acquires its philosophical significance.

Peirce introduced the *pragmatic maxim,* which crystallizes the pragmatist theory of meaning, in his 1878 article "How to Make Our Ideas Clear":

> Consider what effects, which might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object. (Peirce CP 5.402; EP 1, 132.)

> […] what a thing means is simply what habits it involves (CP 5.400; EP 1, 131).
>
> […] we come down to what is tangible and practical, as the root of every real distinction of thought, no matter how subtile [*sic*] it may be; and there is no distinction of meaning so fine as to consist in anything but a possible difference of practice (CP 5.400; EP 1, 131).

In Peirce's early account, meaning is equal to *actual* practical bearings. That invites trouble with *conditionals* and *counterfactuals*. He corrected his actualism on this basis in several writings after 1900 and claimed that to have meaning, it is sufficient for an object to be *potentially* interpret*able* in practice. (CP 2.92, 2.275, 5.18, 5.196, 5.425–27, 5.438, 5.453, 5.457; EP 2, 134–35, 145, 234–35, 340–41, 346, 354, 356.) Short (2007, 173) calls this "the subjunctive version of pragmatism": the meaning of a proposition is how it *would* influence conduct—that is, our habits—*were* it believed and *had* we some practical purpose to which it was germane.

The application of the pragmatic maxim to a concept yields the *operational definition* of that concept. An operational definition states what a concept means in practice[6] (cf. Lindholm 2023a, 14–15).

In short, the meaning of a thing (possibly a speech act) consists in the *potential practical effects* of that thing (possibly another speech act); and these effects consist in our *habits* of responding to that thing. A conceptual difference must make a practical difference.

To understand the pragmatic maxim, we must make an excursion to the analysis of the concept of habit. It must be borne in mind that the classical pragmatists use the term *habit* in a technical sense that cuts across the traditional subject–object dichotomy: a habit is at once both "subjective" and "objective." I have defined *habit* as an *(approximately and relatively) invariant pattern of potential organism–environment intra-action*.[7] An organism and its environment exchange causal signals (including observations and actions) in space and time, and recurring patterns in such exchanges are *habits*. (Lindholm 2023a, 13–14.) I have also argued that the pragmatist notion of *habit* (Dewey 1916a, 54–58; 1922, 14–88) and Rouse's (1987, chs. 4 and 7; 1996, chs. 5–9; 2002, chs. 5–9) notion of *practice* are at least roughly synonymous, though "practice" may capture better what Dewey intended by "habit" (Lindholm 2021, 7; 2023a, 13–14).

Dewey (1916a, 169; 1922, 69, 77; [1925] 1929a, 358) substitutes the distinction between theory and practice with the distinction between intelligent and unintelligent habit (cf. Barad 1996, 166; Rouse 1996, 127; Nöth 2016; West 2016, 216, 219–20; Peirce CP 1.390). Intelligent habit is primary; it can degenerate into unintelligent habit when repeated often enough (Dewey 1916a, 57–58; 1922, 15, 42, 69, 70–71, 77, 208–9; [1925] 1929a, 358; 1938, 32–33; cf. Anderson 2016, 2; Colapietro 2016, 304).

[6] For an example of an operational definition, see Peirce's elaborate account on *lithium* (CP 2.330).
[7] Dewey defined *experience* as *organism–environment interaction*, as I will explain shortly below. I have previously used the usual term *interaction*, but here I apply Barad (1996) and use the term *intra-action*.

Henceforth, when I refer to habits *simpliciter,* I mean *intelligent* habits, unless indicated otherwise.

Habit (practice) is the vehicle of cognition. Reasoning, or the drawing of a conclusion from certain premises, operates upon habit (practice). It serves the purpose of discovering mind-independent facts, because they provide *opportunities for action,* or *affordances* (Gibson 1979). Hence, they are the only *interesting* facts.[8] (Peirce CP 2.137–76, 6.86, 6.286, 6.481; EP 2, 447–48; Dewey [1910] 1933, 100–1; 1916a, 39–40, 54–58, 62, 120, 153–54, 263–64, 319, 323, 400; 1922, 177.) Mind arises from habit (practice), rather than *vice versa* (Dewey 1916a, 39, 57, 344, 392–93). Operationally speaking, belief is habit (practice) (Peirce CP 2.435, 2.643, 4.53, 5.367, 5.417, 5.480, 5.510; EP 1, 112, 114, 198; EP 2, 19, 336–37); and knowledge is a subclass of belief. Therefore, knowledge consists in habit (practice) (Dewey 1916a, 400; 1922, 30–31; cf. Peirce CP 4.531). Thus, reasoning is not distinct from—let alone opposed to—experience. On the contrary, because it is based on habit (practice), it is part of experience.[9] That concludes our excursion.

Recall that both Peirce (CP 6.228) and Dewey (1922, 19, 24, 38, 40, 43, 121, 136) maintain that human character consists in its habits and that habits presuppose and incorporate certain traits of the human environment.

Peirce follows Kant ([1781/7] 1956) in restricting the applicability of concepts to possible experience. The difference is that Peirce's notion of experience not only includes observation but also *entire practices*. For Peirce and Dewey, observation is not self-sufficient: an ongoing course of purposive action constrains it.[10] Peirce also departs from Kant in the respect that the pragmatic maxim eliminates transcendent realities (including *Dinge an sich*) from discourse.[11] They may or may not exist, but we cannot possibly apply concepts to them. Hence they simply drop out as nonsensical.[12]

According to Peirce (CP 5.465; EP 2, 400–1), the determination of the meaning of a thing is an *experimental* matter. To determine what a thing (possibly a speech act) means, one must study how different organisms (including humans) respond to it (possibly another speech act). That naturalizes semantics. Peirce himself did not explain that notion in detail, but Dewey (1929b: 81–84) provided an account on how experiment gives rise to meaning. I have slightly improved my previous versions (Lindholm 2021, 7; 2022, 694; 2023a, 16; 2023b; 2023c, 106):

[8] This motivates my claim that a thing can only be *important* if it is both "subjective" and "objective" simultaneously; see note 2.

[9] According to Peirce, reasoning manifests his third category, which he prosaically called *thirdness*. According to Peirce, each of the three categories is necessarily present to experience (see also de Waal 2010, 10). For my account on Peirce's categories, see Lindholm (2023a, 27–30).

[10] I will explain this notion in the two following sections.

[11] I will explain in the following section that the phenomenal world, which is at once both "subjective" and "objective," is the object of our knowledge.

[12] Thus, Peirce (CP 5.525) was correct in calling Kant a "somewhat confused pragmatist": Kant's mistake was to allow discourse on *Dinge an sich* even though his own principles forbid that. Had Kant been consistent, he would have concluded that the concept of *Dinge an sich* is impossible. See also how the young Peirce refutes concepts, the objects of which are not knowable (CP 5.310–311; EP 1, 51–52).

(1) A known change (possibly nothing, possibly a speech act) is introduced.
(2) Something else (possibly nothing, possibly another speech act) changes as a result.
(3) The changes are correlated.
(4) The previous steps are repeated in different conditions.
(5) If the correlation persists, the agent develops a habit.
(6) The habit associates the cause (the action of the agent) with its putative effect.[13]
(7) Thereby, the cause and its putative effect become (fallible) sign-vehicles of each other: the presence of the one *means* the presence of the other.

This schema applies to linguistic and nonlinguistic meanings[14] alike (Dewey 1916a, 14–19).

We are able to assign meaning to objects on the basis of already established habits: they associate the objects with their potential practical effects. We are also able to project *ends-in-view* (cf. Dewey 1916a, 121–23, 127–29, 205–6) on the basis of habits: by applying knowledge about the potential practical effects of a thing, one may *use* that thing as a means to achieve its potential practical effects. There occurs a conversion of cause–effect relations into means–ends relations, which is, according to Dewey ([1925] 1929a, 136, 177, 180–83, 369–70; 1929b, 84, 295–96), the purpose of all intelligent action. When the task is fulfilled, he calls the result *art* (Dewey [1925] 1929a, 370; cf. Dewey 1916a, 320). Thus, all purposive behavior presupposes habits.

I have defended the pragmatic maxim against Horkheimer ([1947] 2004, 33) in Lindholm (2023b; 2023c, 104–6).

3. Experience

In this section, I will explore the pragmatist notion of *experience*. Thereby, I also implicitly probe the jurisdiction of empiricism, or the doctrine that all knowledge stems from experience; and that of phenomenology, or the science of experience *qua* experience.

Dewey (1896; 1916a, 42, 56, 91–92, 232–34; [1934] 1980, 37; 1938, 66–70; cf. Jung 2010, 147–49, 155–57) provided a phenomenological account on *experience*,[15] operationally defined as *organism–environment intra-action* (Dewey 1941, 183–84; Barad 1996). Its idea is that experience takes place in a holistic *situation*. A situation involves events that take place in an environment, possibly including a number of agents with all their practical and conceptual skills (cf. Barad 1996; Rouse 2002, ch. 8). Thus, a situation is both "subjective" and "objective" simultaneously. An ongoing course of purposive action, which habit makes possible, maintains the unity and coherence of the situation. Epistemically, the situation as a whole is basic, but

[13] I say "putative," because our ability to ascribe causality to phenomena is eminently fallible.
[14] I have explained the notion of *nonlinguistic meanings* in Lindholm (2023a, 17; 2023c, 103–104).
[15] Dewey is actually doing phenomenology though he does not use the very term "phenomenology" itself. I have previously called Dewey's phenomenology "experiential holism" (Lindholm 2023a, 19–23).

a situation can be analyzed into parts, if need be, and if the agent has already mastered the skill of analysis. According to Johnson (2010), contemporary cognitive science corroborates Dewey's phenomenology.

The concept of *situation* might be understood more easily if it is explained as (at least roughly) synonymous to the pragmatist concept of *phenomenon*. Peirce (CP 5.425; EP 2, 340) considered *phenomenon* in the sense of "effect," as in "the Zeeman effect" or "the Hall effect." In this sense, phenomena are repeatable configurations of the *world* (and, *contra* Kant ([1781/7] 1956), not of a "subject"), possibly including a number of agents. Hacking ([1983] 2010, 220–32), Bohr (Barad 1996, 170–71), and Rouse (2002, ch. 8) understand phenomena in a strikingly similar fashion. According to the pragmatic maxim, the phenomenal world is the object of our knowledge. But because a phenomenon in the sense explained above is at once both "subjective" and "objective," that does not compromise the "objectivity" of knowledge.

Peirce (CP 1.90, 6.7–65, 6.102–63, 6.238–71, 6.287–317, 7.572; EP 1, 285–371; EP 2, 3) endorsed *synechism*,[16] or the doctrine that there are continua between many (if not all) polar opposites.[17] It rejects, among other things, the sharp division between organism and environment. By virtue of our habits, there is a continuum between them: there are some events or phenomena that involve both the organism and its environment and cannot therefore be ascribed to one but not the other.

Other organisms are a part of our environment (cf. Dewey 1938, ch. III). Therefore, we are also continuous with other people. That is a methodological presupposition of social psychology. Habits are essentially social and therefore usually shared: they are public, observable, and causal processes and therefore open for others to learn. When newborn human beings are socialized into a community, they cannot but acquire the already existing habits and customs of the community. Later, they may become able to criticize them. (Cf. Dewey [1910] 1933; 1916a; 1922.)

Humans are active creatures by nature: action is the rule and contemplation without overt action is the exception. We do not first receive a stimulus, then process it neurally, and finally respond to it overtly. This linear sequence does not take the cyclical, bidirectional feedback structure of experience into account (cf. Lindholm 2023a). Rather, the usual scenario is that *we act already, and we observe and process our observations simultaneously*. Thus, at least some stimuli may be *results* of our already committed actions. Stimuli are not basic for another reason as well: to be able to identify a stimulus *qua* stimulus in the first place, one needs *training*.

That suggests that purposive action conditions (but does not determine) observation. The purpose (end-in-view) of the ongoing course of action acts as a *filter:* we attend to the observations that bear on the attainment of the purpose and ignore the rest. That economizes on cognitive resources. Therefore the world is experienced as *opportunities for action*. To know is to know what to *do*. That means that *practice is epistemically more basic than observation*. Merleau-Ponty's notion of the body is at least roughly identical to Dewey's phenomenology:

[16] From συνεχής ("continuous"). See also Dewey (1938, 18–19, 23–24), Gale (2010, 65–67), and Santaella (2016).
[17] It seems possible that there is at least one universal medium, namely *matter itself*. In a deep sense, the unity of the world consists in its materiality (cf. Kuusinen 1959, 24).

> What counts for the orientation of the spectacle is not my body as it in fact is, as a thing in objective space, but as a system of possible actions, a virtual body with its phenomenal 'place' defined by its task and situation. My body is wherever there is something to be done. (Merleau-Ponty [1945] 2002, 291.)

Most human activities are non-epistemic: for instance, conversation, the use and enjoyment of certain goods, routine work, or games.[18] Epistemic activity, or *inquiry*, acquires its meaning, significance, purpose, and resources from such activities. (Dewey 1916b, 1–13.)

In practice, each situation involves at least some novelties; it is highly unlikely that two situations could be exactly similar in every respect. Therefore, our habitual action can fail at any time due to unexpected circumstances. We can never be sure about its results. That makes all experience *fallible*[19] and hence *experimental* (Dewey 1916a, 163–78, 237, 317–22; [1925] 1929a, 70).

A situation becomes *problematic* when habitual action fails. That calls for epistemic activity, or *inquiry*. In a problematic situation, objects may have many different meanings, of which some may be contradictory; or they may have no meaning at all. Either way, we do not know how to respond.

Because the epistemic status of our observations is problematic, inquiry reduces events to *data*. But data are not self-sufficient: they present *problems to be solved*. The construction of a solution is up to us. Moreover, data are *selected* by applying prior knowledge to determine what is potentially relevant for the problem at hand. In this sense, data are *taken*, rather than *given*. (Dewey 1929b, 99–100, 103–4, 122–24, 133–34, 172–80, 189–91, 258–59.)

By definition, the problematic situation cannot provide a solution for us. We must analyze it until we find parts that have unique meanings that suggest a solution. Then we can construct a putative solution by rearranging the relevant parts and try whether it succeeds.

Inquiry, whether everyday problem-solving or a scientific endeavor, conforms to Peirce's *belief–doubt model of inquiry*, which I will describe shortly below. The model explains in detail how all experience involves experimentation, at least potentially. It is based on two operational definitions. Peirce defined *belief* operationally as *habit*[20] and *doubt* as the *privation of habit* (Peirce CP 2.435, 2.643, 5.367, 5.417; EP 1, 112, 114, 198; EP 2, 19, 336–37).

The belief–doubt model of inquiry is iterative. We begin with whatever beliefs (habits) we have. A failure in habitual action provides a positive ground for doubt. That prompts an inquiry. It consists in abduction (the introduction of a novel

[18] This claim seems to violate enactivism, namely, its thesis that all experience be cognitive. That thesis is attractive to an extent: a pragmatist can state that habitual action sustains cognition. But that does not make all habitual action *epistemic:* that would require that the purpose of the habitual activity in question be *learning,* or the express acquisition of knowledge. My purpose is not, however, to refute enactivism. Since I have no qualifications in cognitive science, I will simply suspend judgment about it.

[19] The classical pragmatists advocated *fallibilism,* or the position that *any single belief, including mathematics and logic, can be questioned, if there arise positive reasons to do so*.

[20] A careful reader can see that both *meanings* and *beliefs* are defined as *habits*.

hypothesis that accommodates the failure), deduction (the derivation of certain testable consequences of the hypothesis), and induction (experimentation whether or not the consequences of the hypothesis obtain). If the hypothesis resolves the problematic situation, it gives rise to a novel belief (habit), and we can resume our prior activities.[21] If the hypothesis fails to do so, we must revert to the abductive stage. The belief–doubt model describes one form of *habit of habit-change*, or *habituescence* (Peirce MS 930, 18; cf. West 2014; 2016; Gorlée 2016; Nöth 2016).

This model dispenses with both epistemic foundations and epistemic ends (in the sense of τέλος). Inquiry consists in active adaptation and readaptation to (at least potentially) changing circumstances. If followed consistently, the model predicts that our purposive behavior will accommodate to whatever "objectively" constrains it. Thereby, the structure of these constraints gradually becomes the structure of our habits. But as Hume ([1739–40] 1854a, bk. I, pt. III; [1748] 1854b, § 4) correctly observed, the world can change. Therefore, we cannot posit a fixed end for inquiry. We can only say that *if* there is something that stays (approximately and relatively) invariant, *then* our habits (beliefs) will accommodate to it. If we set out from an epistemic foundation, but the world changes, then the foundation may lose its legitimacy, which would compromise our quest for truth. Therefore, we need not—and indeed should not—establish an epistemic foundation from which to proceed safely. Hence, it does not matter at all how we begin inquiry or whether we aspire for a permanent truth. Epistemic justification issues from the *process* of self-correction rather than from a privileged set of beliefs: no belief is privileged; anything can be called into question if need be. One could adapt Eduard Bernstein's (1899, 169) political slogan "the movement is everything, and the final goal is nothing" to epistemology. One could also adapt the colloquial slogan "if it ain't broke, don't fix it" to epistemology as well. Peirce himself would have disapproved the conclusion that truth can change,[22] but we need not agree with him in this respect.

The belief–doubt model of inquiry is further evidence against discourse on transcendent realities (including *Dinge an sich*). According to Peirce (CP 5.412; EP 2, 332), everything that bears on conduct can be discovered experimentally: for if it could not be discovered experimentally, how could it bear on anything we do? A transcendent reality is not amenable to experiment and, by Ockham's razor, drops out of inquiry as a useless hypothesis. Thus, "[t]he world as we experience it is a real world" (Dewey 1929b, 295).

Määttänen (2015, ix) describes the pragmatist notion of experience as follows:

> Human beings are embodied creatures, which are in constant interaction with other elements in the world. The world is experienced as possibilities of action. The hidden causes of perception are not the object of knowledge. The

[21] I have reconstructed the belief–doubt model from Peirce (CP 2.619–664, 5.161–74, 5.265, 5.374–76, 5.416, 6.469–73; EP 1, 28–29, 114–15, 186–99; EP 2, 212–18, 287–88, 336–37, 440–42). See also Lindholm (2023a, 25–27).

[22] Peirce chided William James, his friend and collaborator and co-founder of pragmatism, for the notion of the mutability of truth (see Peirce CP 6.485; EP 2, 450, 457–58; James [1907] 1916, 27, 222–26, 241, 246–49, 255–58; 1909, 59, 68–69, 80, 96–97, 155–60, 158n1).

> structure of experience and the proper object of knowledge can be expressed with the simple scheme: $\mathbf{S_1} \rightarrow \mathbf{O} \rightarrow \mathbf{S_2}$. The situation $\mathbf{S_1}$ is problematic, and some operations **O** have to be performed in order to attain the situation $\mathbf{S_2}$. The latter situation is hidden at first, but not in principle. The object of knowledge is the relation between these situations, and this relation is mediated by controlled activity, certain operations. To know is to know what to do in the situations one encounters in the world. This object of knowledge is within our epistemic access, and there is no need to contrast it with something "more real" beyond the scope of our epistemic access.

Given that experience is organism–environment intra-action, and given that phenomenology is the science of experience *qua* experience, then it seems to follow that phenomenology studies *modes of organism–environment intra-action*. That counters accusations of "subjectivism."[23]

4. The Practice-Ladenness of Experience

In this section, I will apply my thesis of the epistemic primacy of practice to explain multistability.

According to the thesis of the theory-ladenness of observation, proponents of different theories see the "same" set of data differently.[24] The thesis is Kantian in spirit (see Kant [1781/7] 1956): cognition (theory) enters experience and at least partially constitutes it. In this section, I will generalize that into the thesis that *all experience is potentially practice-laden*. I have sketched this generalization already in Lindholm (2024, 57–58); I have adapted that presentation for the purposes of this article.

As I have explained, habits (practices) associate objects with their potential practical effects. When we encounter objects, our habits (practices) related to them remind us about what they can do, or what we can achieve by using them. Thus, as I have explained, our habits make the projection of ends-in-view (purposes) possible.

Purpose arises from habit (practice) and filters experience according to its relevance. The "same" object may be relevant to a different degree for different purposes. Therefore the "same" object may appear differently in different practices. Moreover, different habits (practices) with their different purposes maintain the unity and coherence of different situations. Thus, again, the "same" object may appear differently in different situations. In this sense, Dewey (1922, 32) understands habits as "refractive media." In short, *experience is, at least potentially, habit-laden (practice-laden)*. The practitioners of different practices, at least potentially, experience the "same" objects differently.

Dewey (1916a, 169; 1922, 69, 77; [1925] 1929a, 358) rejected the distinction between theory and practice. Theory is not distinct from, or opposed to, practice; on the contrary, theorizing is one of the scientific practices (Rouse 1996, 127; Barad

[23] See also Ihde ([1977] 2012, 10–13).

[24] For instance, if the data is the duck-rabbit (cf. Wittgenstein [1953] 2009, §§ 118–57, 201–17), some observers regard it as a duck, others as a rabbit.

1996, 166). Because experience is, at least potentially, practice-laden and because theorizing is one of the scientific practices, the thesis of the theory-ladenness of observation follows as a *possible* special case: *some* experiences, including observations, *can potentially* be theory-laden.

Habit (practice) is the vehicle of cognition, as I have explained. Because habit (practice) enters experience, at least potentially, cognition enters experience, at least potentially. That naturalizes the Kantian spirit that the thesis of the theory-ladenness of observation involves.

Different people engage in different practices. Therefore, they potentially experience the "same" objects differently. Even a single person can have different practices related to the "same" object. Therefore, even the "same" person can be able to experience the "same" object in different ways. That explains multistability.

5. Philosophical Anthropology

In this section, I will discuss human nature in general and argue that *technics are, at least potentially, constitutive of human nature*. That is the main thesis of this article. It is implicit in Ihde's instrumental phenomenology. I will make it explicit here.

Recall that both Peirce (CP 6.228) and Dewey (1922, 19, 24, 38, 40, 43, 121, 136) argued that *we are our habits (practices)*. Each habit (practice) is a mode of experience, or organism–environment intra-action. Habit (practice), organism–environment intra-action, and the situation in which it takes place are both "subjective" and "objective" simultaneously. In short, *our identities are not just "subjective" but they also display "objective" traits that result from the biological structure of our bodies and their intra-action with a relatively stable environment of which we are a part*.

I repeat that the world is experienced as *opportunities for action*. Because we are not immaterial Cartesian souls but a part of the world, that also applies to ourselves, our bodies, and therefore also to our identities: *we are what we do*.

By Peirce's *synechism*,[25] we are continuous with our environment, including other people. The medium between us and our environment, and between each other, is our habits (practices). Learning the customs of a person's social group is a significant part of the formation of their personality. When we relocate ourselves or make changes in our environment, that affects our identity to some degree, because different situations are compatible with a different set of habits (practices).

Now, technics are, at least potentially, constitutive of human nature in at least two senses. First, each habit (practice) is an active means. In this sense, technics *necessarily* affect our nature. Each time we learn a new skill, we also reconstruct ourselves to a degree. Second, instruments external to the body, or potential means, are also a *possible* part of the environment that we happen to inhabit. In this sense, technics *potentially* affect our nature. Our environment, possibly including technics, enters our very being. That implies that each time we learn to use an instrument, we also reconstruct ourselves to a degree.

[25] See note 16.

We are continuous with a particular environment to which we have adapted our habits (practices). By using instruments external to our bodies, or potential means, we can reconstruct our environment. On the one hand, that involves a change in our nature. On the other, we can reconstruct other environments so that they resemble our native environment to a greater degree: for instance, we can build space stations to inhabit space. That decreases the cultural shock we might otherwise experience when we move to different environments.

Once more, the world is experienced as *opportunities for action*. Now, the introduction of a technic changes the opportunities of action that the world supplies. Thus, technics enter the structure of our experience, at least potentially. That justifies the underlying idea of Marshall McLuhan's ([1962] 1967; [1964] 2003) media philosophy (though not necessarily its results).

Thus, technics can, at least potentially, become a part of ourselves. For the converse, there are no instruments that are not part of somebody. That follows from Dewey's (1922, 25–26) distinction between active and passive means: to qualify as a means, an instrument must be used in a practice.

Barad's (1996) notion of intra-action itself has anthropological consequences that challenge scientific realism. Her argument is based on the cooperation of agents and nature in the (re)production of phenomena. When we speak about nature, we are simultaneously speaking about who we are, at least implicitly. In what follows, I will explain why.

Barad argues that it is problematic to envisage a "reality" that is independent of our intra-actions with, and descriptions of, it. Barad (1996: 184) believes that "[t]he Enlightenment notion of science is premised on a separation between knowing subjects and observation-independent objects." That suggests that scientific realism is inherently Cartesian. The view from nowhere—or the God's Eye point of view (cf. Putnam 1981, 49), which Enlightenment objectivism requires from scientific knowledge—is pretentious and virtually impossible. It masks the agency of those who claim to have discovered universal laws; and it relegates all unmasked agency to nature itself, as if scientists were immaterial Cartesian souls spectating and registering the unfolding of the miracles of nature.[26] At the same time, ironically, nature is also seen as passive, ready to be bent to do our bidding.[27] In this picture, scientific knowledge would emerge automatically, without intervention, which is patently absurd.

Barad introduced "agential realism" based on an ontology that she derived from Niels Bohr's epistemological writings. Her purpose is *not,* however, to reconstruct Bohr's own view; she is simply using his writings to reconstruct a compatible ontology independently of whether he would have accepted it himself.

Barad argues that phenomena, in the (re)production of which agents participate with all their practical and conceptual skills, are constitutive of reality. That reality is not composed of things-in-themselves or things-behind-phenomena, but things-in-phenomena. Our participation *within* nature constitutes "agential reality."

[26] Dewey (1929b, 23, 196, 204, 211, 213, 245, 291) rejected "the spectator theory of knowledge." The very word θεωρία ("theory") literally stems from θεωρός ("spectator").

[27] Somewhat polemically, Barad (1996, 185) asks: "Why would we be interested in such a thing as an 'independent reality' anyway? We don't live in such a world."

Phenomena make up agential reality; scientific theories describe phenomena; therefore, scientific theories describe agential reality. Truth as correspondence obtains (or does not obtain) between theories and agential reality, not an observer-independent reality. Reality is constituted "by the between" of such distinctions. Agency cannot be designated as residing in agencies of observation or objects in isolation; both are implicated with all their mutual relations. In short, agency is located in phenomena.

The wholeness she requires from phenomena does not, however, signify the dissolution of boundaries. On the contrary, boundaries are necessary for making meanings, and there is no agential reality without constructed boundaries. According to Barad (1996, 182), "agential realism explicitly shows that boundaries are interested instances of power, specific constructions, with real material consequences." Yet boundaries are not fixed.

Reproducibility and communicability are criteria of objectivity. Reproducibility is not, however, possible because of our ability to measure observer-independent properties of an observer-independent reality, let alone a transcendent reality. It is possible because scientific investigations are embodied, grounded in experience, in praxis.

Barad makes a brief declaration of agential realism: (1) it grounds and situates knowledge claims in local experiences: objectivity is literally embodied; (2) it privileges neither the material nor the cultural: the apparatus of bodily production is material–cultural, and so is agential reality (cf. Haraway 1988, 595); (3) it entails the interrogation of boundaries and critical reflexivity; and (4) it underlines the necessity of an ethics of knowing.

Thus, according to Barad, phenomena are material–cultural be-in's [*sic*]: being material and being socially constructed do not exclude each other. Thus, Barad (1996, 183) concludes that "[a]gency is a matter of intra-acting, that is, agency is an enactment, it is not something someone has."[28] If she is correct, agential realism is a realism compatible with social constructivism.

6. Criticism

I have argued that our technics are, at least potentially, a part of our nature. Then, one is entitled to ask whether that applies to other species.[29] I reply that ants build anthills that are part of *their* nature, bees build beehives that are part of *their* nature; birds build nests that are part of *their* nature; beavers build dams that are part of *their* nature; and this holds analogously for any species that applies any kind of technics. I believe there is a continuum between nature and technics.[30] For instance,

[28] Rouse (2002, ch. 7) provides an account of how human embodiment has epistemic significance in the (re)production of phenomena.

[29] I thank Ave Mets (private communication) for asking this question.

[30] Aristotle (1929, 192b5–35, 193a25–193b10, 194a20–30, 199a5–20, 199a30–199b10, 199b25–35, 252a10–15; 1933, 1032a10–b5) argued that technics imitates and supplements nature by fulfilling ends that nature itself is unable to achieve. On the other hand, see also Aristotle (1929, 230a25–231a20, 254a1–15, 254b10–30, 255a20–30, 255b10–25; 1933, 1023b25–36).

some scholars argue that even plants communicate (e.g., Karban 2008; Heil and Karban 2010); and the media they use seem to qualify as technics of disseminating information.

I have suggested that the world, including the truth about the world, can change. That can be understood as a rehashing of Hume's ([1739–40] 1854a, bk. I, pt. III; [1748] 1854b, § 4) problem of induction. That seems to undermine the possibility of empirical knowledge. That, in turn, is a challenge to my empiricism. I reply that that might be a problem if knowledge is considered representationally. But I consider knowledge as a subspecies of belief, that is, habit. Peirce's belief–doubt model predicts that if the world changes, then a readaptation of our beliefs (habits) will take place, and we will simply learn new ways of accomplishing our ends-in-view—or revise our ends-in-view accordingly. Thus, the pragmatist solution to the problem of induction is very simple and straightforward.

Gale (2010, 62) contends that Dewey's notion of *experience* is difficult because it is simply a reformulation of Hegel's Absolute Mind. Because the notion is "mystical," he claims, nobody has understood it. I disagree. I do not know which of the words "organism," "environment," and "interaction" Gale considers "mystical" or "difficult," but at least to me they are perfectly conceivable in naturalist terms.

Noddings (2010, 277–78) argues that Dewey's notion of experience may be too narrow. She wants to take women's experiences into account. Thus, inquiry may commence not only when we stumble upon a problem; we can also proactively *look for* problems. Moreover, the agent of inquiry may be a group, and the consequences of inquiry for other groups must be taken into account. She is correct, but I believe that Peirce and Dewey can accommodate these improvements without too much trouble. The notion of organism–environment intra-action and the belief–doubt model of inquiry are by no means incompatible with them. It seems to me that the active search for problems, collective agency, and sensitivity to the interests of other groups can be simply added to Peirce's and Dewey's accounts and leave the rest intact. Alas, sometimes Peirce himself engaged in looking for problems (CP 5.394; EP 1, 128).

7. Conclusion

We are our habits (practices). Technics enter our habits (practices), at least potentially. I have argued that therefore technics enter human nature, at least potentially. That takes place in two ways. First, our personalities consist in our habits (practices), and each habit (practice) is a skill, or active means. Second, habits (practices) incorporate both the traits of persons and of their environment, and instruments external to the body, or passive means, are a possible part of the environment. I have also argued that experience is potentially habit-laden (practice-laden) and that, therefore, the "same" object can appear differently in different practices, even for the "same" person. I have argued that that explains Ihde's concept of *multistability*.

Given that experience is potentially practice-laden, and given that practices potentially incorporate technics, it seems that *technics potentially affect experience*.

That provides a justification for Don Ihde's instrumental phenomenology, and especially its theory of embodiment relations.

I believe this discussion also bears on transhumanism. If technics are already a potential part of being human, then it seems that the possible transition into transhumanism may not be very radical. Alas, humans have used prostheses for a long time, and they do not seem to involve a threat to humanity. It is not necessarily revolutionary if prostheses become digitized in the near future.

Barad's (1996) notion of *intra-action* can also be applied directly to Ihde's theory of human–technics interaction. Then it becomes *human–technics intra-action*. Barad's concept emphasizes that the human and the technic are mutually responsible for the identity and determinacy of each other. Ihde (2009, 23) himself seems to agree: he grants that both in pragmatism and in phenomenology, one can discern what could be called an *interrelational ontology*. The agent is ontologically related to an environment, but the interrelation is such that both are transformed within this relationality. Ihde also suggests that technology could *mediate* consciousness.

A natural direction for further inquiry is to apply this general notion of technics influencing our identity and character to particular technics. It might be philosophically interesting how the use of the phonetic alphabet, the printing press, or the internet influence human practices and thought. A natural sequel to such an inquiry is a comparison of the results with Marshall McLuhan's ([1962] 1967; [1964] 2003) media philosophy.

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Science Fiction in Ukraine, 1920–2020

Part Two

The Ukrainian authors of the 1970s focused on the search for the purpose of human existence, which led to the beginning of the Golden Age of Ukrainian science fiction (SF). In the 1980s, a national revival began, and SF developed greater local markets and themes. The economic crisis of the 1990s nearly destroyed SF literature in Ukraine. Subsequently, the Russification of the 2000s emerged, and, in the 2010s–2020s, an era of metamodernism began, resulting in a second wave of national revival.

Keywords: *Ukraine, science fiction, existentialism, postmodernism, metamodernism*

Author Information

Oleh Shynkarenko, PhD Candidate in Philosophy, University of Pécs, Faculty of Philosophy
https://scholar.google.com/citations?hl=en&user=1yCMKj4AAAAJ
https://orcid.org/0009-0001-1690-8967

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The 1970s: Conformism and Postmodernism

The 1970s saw the start of a period of so-called stagnation that lasted for twenty years, until the collapse of the Union of Soviet Socialist Republics (USSR). At that time, society lost faith in the victory of communist positivism; all residents of the USSR chose pragmatism as their model and tried to obtain the best possible living conditions amid the destruction of the socialist economy. Pragmatism in Ukraine, among other things, was manifested in the fact that writers often chose the Russian language for writing and publishing their works. In this way, they could obtain a wider market and a larger circulation, because the Russian language was known in all the countries that made up the USSR. It was a kind of conformism: Writers no longer risked their lives for political statements; rather, they chose the path of least resistance for a successful career.

The path of the writer, Boris Shtern, is very revealing here. He sent his story to the Russian writer, Boris Strugatskyi, for positive feedback from him. With this feedback, he turned to the Russian magazine, *Chemistry and Life*, which had begun to publish science fiction (SF) in the 1970s. Publication in this magazine, the circulation of which reached 150,000 copies, practically guaranteed the rapid publication of books and mass popularity among readers. The same applied to the content of the work. To receive widespread popularity, it was necessary to avoid local Ukrainian topics and mainly write about what was happening in Russia. In this way, the impression was created that everything important and worthy of attention happened in Russia; Ukraine, as a colonized provincial territory on the outskirts of the empire, was mentioned only condescendingly and with demeaning humor. The hero of Shtern's novel, *Notes of a Dinosaur*, recalls that he literally fled from Ukraine to Russia because, in his opinion, Ukraine was a country of swindlers and petty thieves, and it would be impossible to make a career there (Shtern 2002, 7). This attitude was also quite noticeable in Shtern's short humorous play, *Zmiiny Island, The Fleet Will Not Let You Down!* (Shtern 1996). This work depicts a group of admirals from different countries of the world who would like to capture this Ukrainian island. Each admiral receives a set of vividly chauvinistic characteristics built on Russian stereotypes. Since this text was written in 1992, a special postmodern humor is noticeable in it. It is impossible to say for sure whether its author is truly a Russian chauvinist or whether he is simply playing the role of a chauvinist, keeping a certain distance from this image.

The history of Zmiiny Island is also noteworthy. Thirty years after the publication of Shtern's play, the Russian–Ukrainian war began, with hostilities taking place on the Ukrainian island of Zmiiny. Ultimately, Ukraine managed to regain control over the island after it had been captured by Russia.

If we look for analogies with other literature, the postmodern irony and humor of Boris Shtern are very close to those of Stanislaw Lem. This is especially true of the series of stories about Inspector Bel Amor, which resembles Lem's series about the pilot Pirx.

Similar to Boris Shtern's fate was that of the very talented Ukrainian writer Volodymyr Savchenko. He was born in Ukraine, but left to study and pursue a career

in Moscow before returning to Ukraine, where he worked at the Institute of Cybernetics. Savchenko wrote all his works in Russian, called himself a Russian writer, and defiantly left the Union of Writers of Ukraine. In 2002, in an interview with the writer Yana Dubynyanska, Savchenko spoke of his feelings about the collapse of the USSR:

> It turned out that I am a very Soviet person. Although I was never a member of the communist party, I was close to illegal publishing and dissidents. But when I saw the results of the collapse of the USSR, I was somewhat despaired. I left the Writers' Union of Ukraine back in 1993 and I still don't miss them. An SF writer cannot write if he does not believe in the future. And it happened that I stopped believing. (cited in Dubynyanska 2002)

In the same interview, Savchenko quite clearly formulated the main creed of cyberpunk, which I call the "collapse of positivism": "The very fact that a person does not become better from the development of technology and service proves that something is wrong here" (cited in Dubynyanska 2002). The Russian writer Ilf, in his notebooks of the late 1920s, made an interesting point:

> Earlier in science fiction, radio was the main thing. People expected happiness for mankind from the radio (Ilf 2021,123). Now we have a radio, but we have no happiness. Since then, as soon as aviation and spaceships appeared, and laser and nuclear power, there was no general happiness, and there is none. Civilization does not work for man (Dubynyanska 2002).

Savchenko's novel, *Self-Discovery*, (1967) tells the story of Ukrainian graduate student Kryvoshein, who synthesized his own clone with extraordinary body capabilities with the help of a computer with artificial intelligence. After talking with his own clone, Kryvoshein-1 decides not to reveal what happened but to send clone Kryvoshein-2 to work at a university in Moscow. Meanwhile, the original Kryvoshein-1 makes his next clone, Kryvoshein-3, who turns out to be a psychopath and tries to kill Kryvoshein-1. Kryvoshein-1 decides to send Kryvoshein-3 to a remote region of Russia, and he himself begins to produce the next, even more perfect clones. During the experiment, Kryvoshein-1 decides to update his own body with the help of a clone synthesizer, but he dies. As a result, many copies of Kryvoshein-1 remain, but the original itself is now missing. In the philosophy of postmodernism, a copy without an original is called a simulacrum ("The simulacrum is never that what hides the truth—it is truth that hides the fact that there is none. The simulacrum is true" (Baudrillard 1994, 1)); it is a key postmodernist term. However, Jean Baudrillard wrote his treatise, *Simulacra and Simulation*, (Baudrillard 1994) in 1981 – twenty-four years after the publication of Savchenko's novel. The example of this book shows how the construction and the subject matter of Ukrainian SF became more complicated in the 1970s. The authors no longer sought to serve the Communist Party or to implement a propagandist directive, or even to escape from reality into "mystical abracadabra," as Oles Berdnyk did in the 1960s. Now the books solved

the fundamental problems of human existence, which would soon be of interest to European philosophical thought. It is interesting that Savchenko's novel, written in Russian, was translated into eleven languages in twelve countries, including in the USA in 1979 in the Best of Soviet Science Fiction series, but there is still no Ukrainian translation.

The 1970s and the 1980s in Ukrainian SF had a lot in common, not only because of the cynicism and conformism of the Soviet people but also because of the spread of the postmodern paradigm of thinking, which was consistent with conformism. If all models and samples are conditionally equivalent, as postmodernism claims, what is the point of victorious exploits for the benefit of the Communist Party? The postmodern model contributed to the avoidance of heroic pathos in literature; preference was given instead to refined logical exercises and literary games. One of the bright representatives of this style was Volodymyr Zayets. A doctor by education, he devoted his stories to paradoxical phenomena of the psyche and the philosophical problems of perception of reality. An excerpt from his story "Temponauts" follows:

> He believed and knew that the past, present, and future exist on the same space–time axis. One thing worried him the most: To what extent is the future determined by the past? Should human will be taken into account, or is this will only apparent and subject to the same objective laws to which all nature, including living things, is subject? When that is the case, there is only one real future. When it is not, the outlines of the future are blurred; there are somehow incomprehensibly several equal and probabilistic realities in it (Zayets 1986, 17).

The writer's stories are distinguished by an unexpected course of plots and an often sharp humor. A sudden twist appears in the last lines of each story that changes the meaning of the entire text. Zayets' works are most reminiscent of the stories full of humor and paradox by American writer Robert Sheckley.

The Kharkiv writer Yevhen Filimonov wrote many stories that are difficult to call SF in the usual sense, although all the signs of this genre exist. For example, in "The Ophthalmologist" (Filimonov 1988, 212) a doctor in some strange way corrects the vision of a healthy patient during an examination, so that this man begins to see the world differently: He has good taste and interest in art, and the banality and the vulgarity that he used to like suddenly disgust him. In another story, "The Music Box," a rude worker asks a doctor to rid him of the memories of classical music melodies that are annoyingly ringing in his head. After this operation, he feels a painful emptiness and decides to heal himself by listening to more classical music. In a third story, "On the Road," a mother tries to explain to her little daughter that they have been racing through space for many years to reach a distant star because their own star exploded. But there is no certainty that the planets of another star are suitable for life. Therefore, wouldn't it be better to stop, to not spend energy on speed but spend it on more acceptable living conditions on a starship? Filimonov was interested in complex and ambiguous topics. There are no instructions, recipes, or propaganda in

any of his stories; he only suggests thinking about which of the proposed lifestyles is better.

However, even at the end of the 1970s, when most Ukrainian writers had lost faith in utopian political theories forever, some authors remained who seemed to still be living in the 1950s. For example, Anatoly Dimarov's fantastic novel, *The Second Planet*, ([1980] 2017) depicts the terraforming of Venus in the twenty-fifth century, which led to the development of fascism. Earthlings manage to significantly improve the climate of this hot planet with extraordinary pressure, but they still cannot live on it, so two new races are artificially bred specifically for the population of Venus: Venusians and Orangs. The first group are only an improved physical modification of people, while the second are significantly behind in development, resembling orangutans. The Orangs develop an underground totalitarian civilization, copying the German Nazism of the 1930s and 1940s. A delegation of Ukrainians goes to the planet to study the sociological and cultural consequences of the existence of the Orangs. In the depths of Venus, they find a city, and in the square there is a statue of an Orang with small antennae and the label "Adolf Hitler." All the Orangs shout "Heil" to each other when they meet, and march in columns. It is a militarized state led by the monarch Orang the Third, and it is based on the works of Hitler and Nietzsche. The main goal of the Orangs is to dominate Venus and exterminate the Venusian race. The language is human, only in reversed letters, so "water" becomes "retaw"; only the words "Adolf Hitler" and "heil" remain unchanged. The Earthlings are captured by the Orangs and have to create new creatures to fight the Venusians, but eventually they manage to escape and inform everyone about the danger of the Orangs. The novel ends like this:

> Venus-Earth spacecraft launched in a month. During this time, great changes took place on Venus: the Orang state disappeared. The Venusians argued for a long time about what to do with the Orangs; there were even voices to declare war and destroy them to the ground, but the majority insisted otherwise. As all the Orangs are sick, they should not be killed, but treated. The reason for their degeneration was also confirmed. The artificial gene of intelligence, which put the Orangs on the same level as humans, turned out to be unstable, and the Orangs awakened animalistic tendencies. Huge hospitals were hastily built, and then armadas of helicopters took to the air with balloons filled with gas. This gas did not kill, but only put you to sleep.
>
> So the Orangs were neutralized and gradually transported to the hospital, where a whole army of doctors was waiting for them. (Dimarov [1980] 2017, 85)

This whole story is shockingly reminiscent of modern Russian propaganda, which claims that allegedly Ukrainians have fallen ill with fascism and should be treated for it. Dimarov claims that fascism is the result of a genetic error, so it can be corrected by means of modern medicine. Such a practice was common in the USSR, where dissidents were treated with the help of punitive psychiatry.

The 1980s: Reconstruction and National Revival

In the 1980s, the futility of the existence of the USSR finally became clear, and its collapse became only a matter of time. All spheres of life in Ukraine were rapidly liberalized; Ukrainian writers who wrote in Russian decided to switch to Ukrainian in order to support the national culture. These were rather short times of national romanticism, when it seemed that independence from the USSR would solve all problems by its very fact. Such an exalted state also affected SF. Many new authors appeared, and experienced authors published new books, some of which became iconic.

Natalie Haydamaka's story "Only Three Steps" (Haydamaka 1990) is about existential choice. A woman sees a boy in the road who is about to be hit by a truck and she rushes to save him, but suddenly some unknown creatures stop the flow of time. They inform the woman that in three steps she will save the boy but she will die herself, and in their opinion the young woman's life is more valuable than the boy's. The creatures advise her not to take the last three steps but instead to save herself. Then they start time again. The woman manages to survive and to save the boy.

Ihor Rosokhovatskyi's (1989) short story collection, *The Last Signal,* became iconic in the 1980s. This author consistently dealt with the topic of artificial intelligence and wrote a trilogy about the "syhom" Yuri (synthetic homo – artificial man): *The Guest* (1979), *The Possibility of an Answer* (1984), and *The Last Signal* (1989). Syhoms in Rosokhovatskyi's books are almost identical to Philip K. Dick's androids in *Do Androids Dream of Electric Sheep?*

Rosokhovatskyi's earlier story "Syhom and the Dictator" (Rosokhovatskyi 1977) depicts a situation where logic and freedom defeat evil will. Syhom is built by the head of a business corporation known as the Dictator, who deliberately restricts Syhom's access to information. The Dictator seeks to build a world based on strict rationality. Syhom gets his energy by consuming adenosine triphosphate, which can only be obtained from living things, and this causes death in people or animals. When his energy level decreased and there was a need to restore it, Syhom goes to the hospital, where he finds a dying patient. This person is a professor of biochemistry who asks Syhom who he is and why he came to see him. Syhom replies that his energy resources have dwindled, so he had come to pump adenosine triphosphate from the professor. Without a shadow of fear, the scientist says, "I understand," and offers to help Syhom complete the formula for a new type of artificial protein that might come in handy when building "new organs" for him. When Syhom replies that he cannot stay, because the Dictator has ordered him to conquer the world, the professor remarks that he should read in books how all previous attempts to conquer the world have ended. Syhom replies that the Dictator forbids reading books in libraries. Then the professor declares: "You must do what people always do – break the ban." (Rosokhovatskyi 1977, 231) Syhom has not been in contact with the Dictator for six weeks. When he returns, he reveals that he has created new organs for himself that allow him to feed on solar energy, and he no longer needs to kill people or animals in order to survive. In addition, Syhom says that he does not intend to conquer the world, as he was ordered. Hearing this, the Dictator commits suicide. Syhom responds, "That's reasonable." (Rosokhovatskyi 1977, 234)

In Rosokhovatskyi's story, "The Missing Link," Syhom rebuilds his body in such a way that it now consists of plasma. There is nothing human left in him, so he does not feel any emotions toward a human, and does not want to help him because he does not see any practical sense in it. Syhom wants to explore space and discover the fundamental laws of the universe, but he lacks one link to understand these processes. After talking with the cosmonaut, he understands that this link is compassion.

In these two works, it is noticeable that Rosokhovatskyi considers syhoms to be inferior, without emotional intelligence and other traits that are inherent in a person. However, such an attitude is clearly anthropocentric. The author simply wants the "missing link," some missing brick of another non-human mind to belong to man, because the human mind, according to Rosokhovatskyi, is perfect. There is no evidence to support this assumption. We do not know exactly how artificial intelligence will work, or whether a human will be interested in it.

One of the most interesting SF writers of the 1980s, Viktor Polozhiy, is known for his collection of short stories *Solar Wind*. The author's thinking is paradoxical and unexpected. The story "Coroboro" is about the cautious inhabitants of the planet Coroboro who, wanting to check the intention of aliens from other worlds, first turn into heroes of their memories. Distinguishing phantoms from real people is very difficult, but some small details can give away the truth. In the story "Planet with a Hole," a housewife is worried about the burnt meat, but suddenly finds out that it is not her fault. A beam of transgalactic communication of a distant civilization had just passed through her pan. However, later it turns out that not only was her pan affected, the entire planet became "leaky," and one little boy figured out how to use a flashlight battery to establish contact with an extraterrestrial mind. Then, in "The Center of the Universe," which is more of a programmatic essay, there is an interesting segment that illustrates the current state of thinking.

> In the dark gorge, the brain collapsed: three thoughts are fighting. One philosophizes, the second became in opposition to her, and he deliberately drove the third into a gorge so that it would not destroy the shaky tranquility of the first. So, this is the fourth. Long live the fourth! The one that won't let a sober thought out of the gorge. (Polozhiy 1989, 29)

There is no place here for the propaganda of communism of the 1930s or for the unequivocal perception of the reality of the short-sighted fiction of the 1950s or even for the anarchic protest of mysticism of the 1960s. The 1980s marked the beginning of a multi-cognitive existence, when knowledge of the world was conducted simultaneously by several competing streams of consciousness, and it was never possible to say which of them was leading or which should be given priority. An advantage is something temporary that can be quickly lost under adverse conditions.

Vasyl Holovachev wrote his first short story in 1969, but even in 2022 he has not lost fans; there are still those who are waiting for his books. In total, Holovachev wrote more than twenty novels, and more than sixty short stories. Currently, the total circulation of his books exceeds twenty million copies. However, by the end of the 1980s he had stopped publishing in Ukrainian; in 1995 he moved to Moscow

and became a de facto Russian writer. The main theme of his novels is the collision of Earthlings (Emergency Rescue Service) with extraterrestrial intelligence. But since the 1990s, Holovachev's works have combined space fiction with esotericism, national-patriotic orientation, and Russian neo-paganism. In his novel "Non-Russians are Coming" (2009), Holovachev paints a large-scale picture of the struggle of freedom-loving "pagan Slavs" against the forces of evil. According to the author, the ancestors of the Slavs were natives of Arctic Hyperborea. He criticizes historical scholarship for disagreeing with this point of view. Positive heroes are "modern Russian pagans" who choose freedom and a world without evil. In the author's works, the Freemasons and the Christian Church serve the dark forces, and these forces themselves are led by the Galactic Knesset and the Sanhedrin. Many of the antagonists' names are Hebrew names written from left to right. Antagonist rituals require the use of blood. The evil forces are helped by Americans and people from the Caucasus and Central Asia. In addition, the threat to Russians in the author's works comes from China. In the end, Holovachev's works serve to zombify Russians, to form a distorted conspiratorial picture of the world in them, and to strengthen militarism in order to provoke military aggression.

The 1990s–2000s: Economic Crisis and re-Russification

By 2000, the publication of literary SF in Ukraine had significantly decreased. Despite the fact that more than thirty SF writers lived in the country, their works were mostly published in Russian, becoming a part of Russian literature. The main reasons were the publishing crisis in Ukraine, the more developed Russian publishing market, and the writers' desire to find a wider audience. For this purpose, Ukrainian SF writers often resorted to the exploitation of techniques that resonated with Russian chauvinists and revanchists.

Students and later teachers at Kharkiv State University, Dmytro Hordevskyi and Yana Botsman were fond of fantasy and the USSR. This dangerous mixture very quickly led to the fact that they lost all contact with reality and went mad on the soil of Russian imperialism. In the early 1990s, they came up with the pseudonym Alexander Zorych and wrote twenty-three novels. One of them, *No Mercy*, contains the following statement:

> In 2079, the last twenty US dollar bill, brought to the State Bank of Russia by the unfortunate heir of some half-mad hoarder, was purchased for one ruble and twenty-three kopecks. The green twenty was handed over to the Historical Museum – where it is to this day, anyone can see. (Zorych 2005, 37)

Depicting life on Russian space cruisers, Hordevskyi and Botsman are certain that in the distant future they will arrange an Orthodox prayer service before battles. In the novel *Moscow Time!*, Alexander Pushkin, a cadet at the Military and Space Academy, explains the superiority of a Russian human over a non-Russian one in this way:

> We were never ashamed to be idiots. When everyone around believed in the Market, we believed in God. When everyone believed in the Law, we believed in Love. When everyone believed in Order, we believed in Purity and Grace. We've never been afraid to be a little … crazy. Ivanushka the fool always goes hunting on a bad and flimsy horse, dressed in a holey caftan, in a crooked old hat, and returns with the tsar's daughter and a chest of gold. And all because Ivanushka is a fool of the humblest opinion about himself. He does not demand victories from the world and does not even hope to win. He does not care about success, justice and even a tsar's daughter. But the heavens entrust victory to him. Because they know – only Ivanushka the fool will dispose of this victory correctly. And the tsar's daughter will like him, she will definitely like him. (Zorych 2007, 112)

Dmytro Hordevsky is convinced that really talented authors can only appear in Russia; he considers Ukraine a countryside where no great culture can exist. After the death of the postmodernist-imperialist, Kharkiv writer Yevgeny Savenko (Limonov), he wrote, "We, the people of Kharkiv, are especially sad today – we, in the countryside, do not produce as many writers as in these capitals of yours." (Hordevsky 2020)

It is very difficult to write about Ukrainian fiction at the beginning of the twenty-first century. At times it appears that it might be better to skip this period and go straight to the 2020s. A significant number of Ukrainian authors in those times literally went crazy, existing in a bizarre world of fantasy, space operas, and conspiracy theories. One of the most vivid examples is Donetsk SF writer, Fedir Berezin, who became the deputy of Russian terrorist Igor Girkin, who was personally responsible for the murder of the passengers of flight MH17. Berezin also fought in a tank battalion of terrorists of the so-called Donetsk People's Republic (DPR; the Ukrainian city of Donetsk was captured by Russian terrorists), who received weapons and money from Russia. The following is a typical excerpt from Berezin's novel *Red Stars: Nuclear Dawn*:

> One of the Russians, who has been in the biological module for the third day and is officially investigating how the AIDS viruses behave in weightlessness, was listening in on the conversation of American physicists, as well as spying on them. Information was received into his biomodule through a masked eighty-meter light guide from a micro-camera assembled in Kazan from Swiss components. (Berezin 2013, 24)

The plot of the novel is as follows:

> Coming from nowhere the aircraft carrier formation caused a terrible defeat of the invincible USA navy and disappeared, literally dissolving in the fog. Who dared to challenge the only superpower of the planet? The special services of the United States and Russia begin a joint operation to find the location of the mysterious enemy. Russian secret police (FSB) officer Roman

> Panin penetrates the 'enemy's lair', but … is it the enemy? After all, the inhabitants of World-2 are not to blame at all, that their story is somewhat different from ours and on the Eiffel Tower a USSR red banner proudly flies. (Berezin 2013, 12)

All of Berezin's other books are far inferior to this one, in both the literary and the political sense, but it is also impossible not to mention him at all. For example, *The New Yorker* magazine devoted a long article to Berezin, calling him the "Russian Tom Clancy" (Hitt 2016, n.p.). In addition, Berezin corresponded with the founding father of American cyberpunk, Bruce Sterling, and told him that the flag of the fictional Moscow-based "Novorossiya" (a separatist enclave in eastern Ukraine captured by the Russian army) resembled the Confederate flag during the American Civil War. But one passage from the interview in *The New Yorker* is the most telling for this Ukrainian writer. In it, he says that he believes in the Matrix, because a terrorist from the DPR managed to kill five Ukrainian soldiers with his last five cartridges, although the soldiers all had automatic weapons. So gradually, from the Russian neo-paganism of Vasyl Holovachev, through the Russian chauvinism of Alexander Zorych, Russian-speaking Ukrainian writers reached terrorism.

The duo of Russian-language writers Serhiy and Maryna Dyachenko are extremely popular in Ukraine. What they wrote is hard to call SF, though; this is fantasy. The Dyachenkos themselves call their style "m-realism," obviously alluding to magical realism, and there is some truth in this. The events of some of the Dyachenkos' books take place in the modern world with all its everyday details, but witches and demons operate among ordinary people, as in the novel *Obsessed*. The authors' texts are quite stereotypical and completely within the limits of popular culture.

The novel *Wild Energy: Lana* (Dyachenko and Dyachenko 2006) is based on an image from a video clip of popular singer Ruslana and exploits the genre features of dystopia and fantasy. The book depicts the society of the near future during an energy crisis. Energy is needed not only for devices but also for synthetic people who are charged through wires. They also depict inhabitants of the upper floors – the "wild ones" who fly on self-made wings and are able to generate life energy themselves. In addition, there is the Factory, where life energy is extracted from the wild and transferred to the synthetics in the city. The plant once used the energy of natural elements, but after taking too much, it crashed. Subsequently, the Factory can no longer use the elements but instead draws energy from wild people who have the will to live. The main character, synthetic Lana, unexpectedly learns that she is "wild" and gets acquainted with a tribe of "wolves" from whom she learns a special dance that allows her to generate energy. Together, the wilds and the wolves try to destroy the Factory, but eventually Lana becomes a part of it and begins to produce energy for all the synthetics.

The Ukrainian–Russian gas conflict of 2005–2006 between the Russian company Gazprom and the Ukrainian company Naftogaz, regarding the conditions of the gas supply to Ukraine and gas transit to European consumers, gave *Wild Energy: Lana* special relevance. In March 2005, the Russian gas monopoly Gazprom demanded that Ukraine pay for gas starting in 2006 at prices close to European prices (about

$250 per 1,000 m³). At the same time, Gazprom itself bought gas in Turkmenistan at a price of $44 per 1,000 m³. The Ukrainian leadership was not ready to pay more until the last moment, and Gazprom stopped the supply on the night of January 1, 2006. Gazprom made accusations that Ukraine "started to take unauthorized gas" intended for European consumers. Representatives of Ukrainian Naftogaz denied these accusations.

The Dyachenkos are the authors of more than twenty-five novels and more than eighty short stories. At the Eurocon-2005 congress in Glasgow, Maryna and Serhiy Dyachenko were recognized as the best fiction writers in Europe. Most of their works were translated into Ukrainian and were often published simultaneously with the Russian version.

In 2009, the Dyachenkos moved to Moscow and wrote the scripts for seven films and TV series, four of which are banned in Ukraine, because they show contempt for the Ukrainian language, people, and statehood. Furthermore, they distort and rewrite certain facts of history in favor of Russia and popularize the bodies of the aggressor state.

The writer Henry Lion Oldie is actually a literary duo of two authors – Dmytro Gromov and Oleg Ladyzhensky. All of Oldie's works (several dozen novels) were written in Russian and intended for the Russian book market. Oldie is incredibly popular in Russia, where they have received about fifty literary awards. Stylistically, the works feature postmodern fantasy and alternative history. In the novel *We Have to Live Here* (Oldie and Valentinov 2005), a man-made disaster occurs in the Institute of Applied Mythology. Employees of the institute claim that in order to eliminate the consequences of the disaster, the residents of the city need to pray and make sacrifices not only to Christian saints but also to poltergeists and other mythical creatures. Gradually, fairy-tale creatures become a part of real life, but they fall into the hands of the mafia, which is greatly strengthened. Because of this, the government decides to destroy the entire population of the city.

Oldie, the Dyachenkos, and Andriy Valentinov formed a certain literary alliance. They wrote several novels together and all of them are presented together on Oldie's website, "Oldie World" (Oldie 2024). They have a lot in common. The novel, *We Have to Live Here*, is an urban fantasy written in Russian, which has its roots in the novel *The Master and Margarita* by Russian Mikhail Bulgakov (Bulgakov 2024), as does the novel *Monday Begins on Saturday* by the Russian Strugatsky brothers (Strugatsky 2016). All of them exist in the Russian cultural space and can be considered Ukrainian only conditionally, but still they have many supporters in Ukraine.

Russian-speaking Ukrainian writer Yana Dubynyanska is the author of approximately twenty books in the style of urban fantasy. One of her most interesting novels is *Your Own Time.* (Dubynyanska 2016) It is a novel with a key, where real people are hidden behind fictional names. The action of the novel takes place during one of the two main literary events of Ukraine – the Forum of Publishers in Lviv (the other is the Book Arsenal in Kyiv). According to the author:

> There are two lines in the novel – one is realistic, the other is futuristic. In a futuristic, fantastic line, the concept of time is literalized: each person, in

addition to his own space and residence, also has his own time. A person can control it: either speed it up, or, conversely, slow it down, or stop it altogether. This leaves an imprint on the life of society: when people do not have a common dimension of time, society is atomized, individualized, people need strong motivations to meet and communicate, work or personal. There is a subculture of party people who do it for the fan, but most people do not need that. Therefore, to some extent, this is a society of lonely people. Actually, 'your own time' is, among other things, also a metaphor for loneliness.

The second story line of this novel takes place in our time – but here too people can do a lot with their time. For example, Arna, a young poet and musician, lives very quickly: everything is on time, she can go around the whole country in a few hours, overtaking astronomical time. And the poet Vira, an elderly woman, meets her last love and her time stops, is conserved. (Dubynyanska 2017)

Yana Dubynyanska's novels, although written in Russian, do not contain compliments to Russian chauvinism, yet it is difficult to call them rooted in Ukrainian culture, because they are largely cosmopolitan.

However, in the Ukrainian literature of the time another current of purely Ukrainian fantasy, based on mysticism and mythology, emerged. One of the brightest representatives of this approach is Halyna Pahutyak. She has created a legend out of her biography, claiming that she was not accepted into the university's archaeology department because she was not a member of the Communist Party of the Soviet Union. She also considers herself to be a descendant of Count Dracula. Halyna Pahutyak's novel, *The Servant from Dobromyl,* describes the events of 1949 and the previous 800 years in the town of Dobromyl and its surroundings. The servant from Dobromil is a dhampyr (son of a vampire and a witch). The master and mentor of the servant is the vampire Merchant from Dobromil. They and their like-minded "bees that do not lose their sting in battle and do not sleep at night" (Pahutyak 2012, 117) protect people from evil, from external and internal enemies. *The Servant from Dobromil* (Pahutyak 2012) is a Gothic fairy-tale written in the aesthetics of modernism at the beginning of the twentieth century. One feature of the novel is the complete absence of flirtations with Russian themes. The Russians are portrayed as clearly evil. As literary critic Tetyana Trofymenko noted,

In the 20th century, evil in Pahutyak's novel takes on the unambiguous features of the Soviet empire, whose servants are identified with the image of the antichrist (for example, the Soviet Secret Police (NKVD [Narodny komissariat vnutrennih del - The People's Commissariat for Internal Affairs]) captain, who derives purely vampiric pleasure from blood and murder). (Trofymenko 2008).

The author contrasts the evil of the Soviet empire with the infernal mystical evil from ancient mythology, which, in her opinion, has greater power due to ancient

traditions. For this book, Halyna Pahutyak received the National Shevchenko Award for Literature.

The 2010s: Metamodern Revolution, Literary Associations, and Special Studies

In the 2010s, inexpensive mobile internet connection appeared in Ukraine, which allowed millions of people to be online almost continuously. This had significant cultural consequences in that the era of metamodernity began. Ukrainian writers gained access to the latest treasures of world culture in greater volume than they ever could have imagined. In addition, many of them already knew English and other languages fluently, so they could quickly learn about literary and scientific news independently, without translation. At that time, a visa-free regime with EU countries was introduced, so writers from Ukraine began to travel a lot and to attend international literary events.

One such author is Maksym Kidruk, who has visited more than thirty countries, received a degree in software engineering in Sweden, and writes books that can be called multimedia collections. Along these lines, his recent novel, *Colony: New Dark Ages*, (Kidruk 2002) was created together with a designer of three-dimensional objects who recreated in detail the Martian colony where the events of the book take place. According to the plot, humanity on Earth has not yet recovered from Clodis disease, which led to the largest pandemic in half a century, when a new pathogen appears that infects pregnant women exclusively. A group of immunologists is trying to determine what it is and whether its appearance is related to the neutrino bursts recorded around the planet. The population of the Martian colonies exceeds one hundred thousand inhabitants, a third of whom were born on Mars. They lose out to specialists from Earth in the race for jobs in the knowledge-intensive economy of Mars and are forced to work in low-skilled manual jobs. *Colony* is the first book from the fantasy series *New Dark Ages* about the world in the twenty-second century. This is a story about man, who despite all the achievements of civilization, does not change, and neither increasing life expectancy nor even transforming into a two-planet species will guarantee humanity's salvation.

The urban fantasy dilogy that comprises *Do Not Look Back and Be Silent* and *Until the Light Goes Out Forever* also adheres to the principle of multimedia. A mobile application was especially created for each novel with additional details: cover animation, stories, and even a chatbot for the main character. According to the plots of both books, teenagers unexpectedly encounter the existence of a parallel reality that can both help solve problems and create new troubles.

Svetlana Taratorina's (2019) novel *Lazarus* is very interesting. This is a mystical fantasy detective story written in a pseudo-retro style. Such a whimsical combination gives the author the opportunity to present completely realistic problems behind the fairy-tale backdrop, the main one being Russian chauvinism. According to the plot of the novel, detective Oleksandr Petrovich Tyurin, from the capital of the empire (a fancy version of Tsarist Russia before the First World War), comes to

Kyiv, the capital of Mezha (a whimsical version of Ukraine, called "the country from the edge or near the border"), in 1913. The border is inhabited by various fairy-tale characters who were literally transferred into reality from folklore and have the common name "unclean force" or simply "evil." All the representatives of the evil force are of different nationalities from the inhabitants of the capital of the empire, and, therefore, a certain parallel arises: The people are Russians, while Ukrainians, Jews, Poles, and other non-Russians are evil. People constantly fight with evil spirits, organize pogroms, publish chauvinist newspapers, and the investigator himself has to investigate a crime that was probably committed by evil spirits against people: They killed a human boy whose mother married a merman (an evil spirit, the embodiment of the water element as a negative and a dangerous phenomenon), and therefore, an "interracial" marriage took place. The events that take place in *Lazarus* share many historical parallels with real events. Each of them has its counterpart; for example, the pogrom of the unclean in *Lazarus*, dated 1892, is clearly the Jewish pogrom in Kyiv in 1881. However, the author herself claims that direct parallels cannot be drawn because this fictional world is not real. The border is not Ukraine, and the empire is not Russia. Such a distance allows her to always be in the space of metamodern uncertainty, where there is a constant flickering, a fluctuation of fiction and reality, seriousness and humor, primary and secondary.

Maxim Gah's (2016) novel *The Fifth Park* is also a certain stylization of SF that constantly flickers between different genres. In this clearly metamodern text, we see the reality of the post-Soviet city with all its dilapidated artifacts of the USSR, which now have a rather decorative role. At the same time, however, modernity is presented, much like a cyberpunk text in the tradition of Bruce Sterling. This is seen when the technocratic utopia fails to bring the desired happiness, positivism collapses, the heroes are part of the delusion of ghostly fantasies, and the imaginary saves them from the real. This novel is distinguished from pure SF by the absence of such genre features as a clear plot and rapidly unfolding events. In *The Fifth Park* there are many poetic fragments that paint a picture of the character's consciousness, descriptions of architectural structures, and features of technical devices.

Oleh Shynkarenko is a representative of the Ukrainian metamodern in SF. The novel *Kaharlyk* is a dystopian work written in 2012 (Shynkarenko 2015) about the consequences of the Russia–Ukrainian war a hundred years after its end. The text is not only about the destruction of infrastructure and the depopulation of territories, it is also about the destruction of language and semantic spaces. As a result, a very bizarre reality appears before the reader in which the main character, Oleksandr Sahaidachny, exists in three variations:

- as a person who lost a part of his individuality along with his memory and is in search of it, traveling through the Kyiv region of Ukraine;
- as a copy of Sahaidachny's consciousness, which is part of a rebellious Russian satellite-oppositioner; and
- as a second copy of Sahaidachny's consciousness in another satellite, which has almost nothing to do with him because it is infected with the virus of Russian propaganda.

The original Sahaidachny is trying to regain his memory by communicating with the residents of Kyiv and the surrounding villages, some of whom are also copies of long-dead people recorded on morphons – special devices for making an instant copy of consciousness. A continual analytical study of the structure of individuality takes place in the novel, as well as the consequences of the impossibility of the evolution of its copy.

The novel *First Ukrainian Robots* (Shynkarenko 2015) is an attempt to assess the consequences of the coexistence of artificial and natural intelligence. In the answer to this question, one cannot be sure that these two types of minds will understand each other. The book is a series of humorous sketches in the manner of Monty Python, built on the lack of common views and goals between robots and people. Robots become certain "others," a new race that people perceive only as their corrupted copy and not as personalities. Robots, in turn, do not see people at all, perceiving them solely as a temporary deviation of the algorithm.

The novel *Skull* (Shynkarenko 2017) explores the roots of Russian resentment and chauvinism, which led to external aggression against Ukraine. It is full of fantastic episodes with elements of satire. Thus, in one of them, the archetypal couple of a maniac and a girl in love with him, traveling through the fabulous Russian territories, unexpectedly fall into the captivity of a hut on chicken legs, a kind of walking drone, which was developed by the Ministry of Defense and is now heading up a whole battalion of huts to conquer the countries of the West. Trying to escape the shack, the couple studies the manual, *How to Rule a Shack on Chicken Feet*, written in a fanciful Church Slavonic slang and offering no practical advice.

Translator and publisher Oleksiy Zhupanskyi is the author of several fantastic novels, one of the most interesting of which is *God Bless You! Black GenSec!* (Zhupanskyi 2017). This is a rather original postmodern urban fantasy. Zhupanskyi's novel, which differs from the typical urban fantasy, is quite well known in Ukrainian literature. It keeps a constant ironic distance from the image, which gives the impression that the author wanted to write a book in some other style and on some other topic, but was forced to hide behind popular genre templates and juggle stereotypes, using them as a mask.

The novel, *God Bless You! Black GenSec!*, serves as a haunting chronicle of mystical quests. It commences in eastern Ukraine, traverses the protagonist's childhood, which is revealed to be vastly different from his previous perceptions, and concludes in the capital with a foreboding climax involving an otherworldly game. Though the exact stakes are unclear and ambiguous, they are undeniably of the utmost significance. The heroes immediately find themselves in a whirlwind of extremely confusing events. They collude and betray, carry out dark corruption rituals, obtain scarce goods, blackmail and kill, revive the dead and conduct meetings of the parliament. As a result, the "soft irrational" is removed from the deputies, and the rest are killed. They get to the mysterious Red Collector, and then to the Vernadskyi Library vault, where they study the secret archives of the Tablets of Power, and get the keys to the last door. Behind this door, perhaps, the grand prize awaits them, which no one really knows anything about, other than the fact that it is the most desirable for everyone.

Oleksiy Dekan became one of the first authors of fantastic mash-ups in his novel *The Kaidash Family Against Zombies* (Dekan 2021). The novel is a realistic social and everyday novel by Ukrainian writer Ivan Semenovych Nechuy-Levytskyi, written in 1878. In the story, through a series of tragicomic situations from the life of the Kaidash family, the damage from spiritual disunity is demonstrated, which leads to selfishness, discord, and inept use of the legacy of previous generations. In this work, the problems of the peasantry, which were pressing at that time, were artistically reproduced, including the impoverished life of farmers, the destruction of the patriarchal system, and the ignorance and superstition of the peasants. Dekan depicted in his mash-up novel the struggle of the Kaidash family against an influx of zombies, which in the text are called the "living dead." The word "zombie" is a special term for the cover, apparently to increase the appeal of the novel. Such an absurd combination, on the one hand, completely destroys the original intention of Nechuy-Levytsky, and on the other hand, gives birth to a completely new logic when a typical genre novel about zombies suddenly acquires an additional dimension in the space of classical Ukrainian literature of the nineteenth century. The novel is also in a certain sense anti-colonial, because it addresses the struggle of Ukrainian peasants with the remnants of the inhabitants of the Russian empire, where everyone turned into the living dead because they played with black magic. Such a picture is a vivid illustration of the Russian–Ukrainian war, which is an anti-colonial war, and the Ukrainians are forced to repel the attacks of Russians zombified by Russian propaganda (the modern equivalent of black magic).

A very important author of the 2010s was Yuri Shcherbak, a representative of the literature of the "sixtiers." He should probably be considered in the section next to Oles Berdnyk, especially since they share many common stylistic and worldview characteristics, the main one of which is religious mysticism. Both Berdnyk and Shcherbak distrust the idea of technological progress, which, in their opinion, will lead humanity to a dead end. Instead, they propose focusing on the search for an irrational mystical insight that has no scientific or logical basis, not noticing that such "insight" is a real dead end because there are no recipes for its achievement and it is a purely speculative hypothesis.

In the 1960s, Shcherbak did not write SF and abandoned literary work as soon as Ukraine gained independence in 1991. He began to engage in politics and for many years worked as the ambassador of Ukraine to the USA, Mexico, and Canada. However, by the end of the 2000s, Yuri Shcherbak sensed the approach of catastrophic events for Ukrainian history and created a trilogy of apocalyptic and dystopian novels, the action of which takes place in the second half of the twenty-first century.

The first novel in Shcherbak's trilogy, *The Time of the Dead-Christs: Mirages of the Year 2077* (Shcherbak 2020), describes the world shortly after the Third World War. A number of large cities, such as Detroit, Seoul, and Jerusalem, were destroyed by nuclear explosions. Nation-states have either collapsed and are in decline, or have joined unions. The world currency globo has been introduced, and the real power belongs to corporations. The formation of the Black Horde began in Mongolia, a union of Muslim and Islamized states that gradually took over Central Asia,

Siberia, and the countries of the Near East. This led to termination of the latter's oil exports. Russia disintegrated into separate states, most of which were part of the Black Horde, the Chinese Celestial empire, and Japan. In 2076, its part, known as the Empire of the Double-headed Eagle with its capital in Moscow, fell into the course of a huge Muslim uprising and became a component of the Horde. Ukraine remained outside the Unions, but it remained a valuable partner for many supranational entities. In 2048–2052 there was a Romanian–Ukrainian war, and in 2068–2070 there was a Moscow–Ukrainian war, both of which were won by Ukraine. Neighboring countries prepared for raids on Ukraine to capture food, the lack of which was felt more and more acutely. The Black Horde seeks to assimilate the Slavs in order to oppose other alliances and eventually achieve world domination. The Horde has numerous agents among the powerful of Ukraine, and, in order to disunite the state, it uses the teaching of the death Christ sect that Christ died and did not rise again. Therefore, people have lost their connection with God and are free from traditional Christian morality.

The continuation of the trilogy, *Time of the Great Game: Phantoms of 2079* and *Time of the Tyrant: Epiphany of 2084*, have all the shortcomings of the first part. They both contain an extremely confusing illogical plot, built on popular conspiracy theories and geopolitical thrillers. For example, it says that the World Government allegedly planned the Third World War in order to establish a new world order. Its goal was to eliminate all nation-states, replacing them with unions, to introduce a single English language and a new world religion – the worship of space and time. According to the plan of the World Government, for the survival of humanity, it is necessary to reduce the population to 1 billion–1.5 billion and to divide it into the castes of the wealthy and the debtors. In 2084, Ukraine remained the last stronghold of Orthodoxy, after the Islamists captured Istanbul. Pope Clement XV plans to unite the Catholic and Orthodox churches to oppose the Global Jihad led by Omar al-Bakr. Creating aggressive Muslim movements around the world, he was defeated by the Black Horde, which quickly disintegrated after the Great Flash, but did not abandoned its plans for world domination. The third novel ends with a description of the results of an expedition to a space object called Heavenly Jerusalem. Only one astronaut admits what he saw there—a repository of the souls of all living and non-living things, in the center of which was God. After the death of the bodies, they are purified in this heavenly city and returned to be reborn into new bodies. However, there exists another memory from a Ukrainian astronaut, who learned that the soul of the hero, unlike the souls of many other rulers, was freed from the burden of sin through repentance and received Enlightenment.

In this book, typical of the literature of the "sixtiers," everything is built on mystical insights and a baseless conclusion is made that the problems of humanity are connected with the decline of traditional Christian morality, which was bequeathed to us by distant ancestors. The novels are too anachronistic; their style is reminiscent of Tom Clancy's spy thrillers, and in some places they impress with naivety and bad taste, where magical realism is mixed with the grotesque, but this is not as important as the sense of impending disaster, which Yuri Shcherbak manages to convey very accurately.

Literary Associations

In the 1980s–2000s, the vast majority of SF festivals and the activities of literary associations took place in the usual mode of face-to-face meetings, but in the late 2000s they mainly moved online, which contributed to a significant revival of their productivity.

The SF literary association, Star Fortress, was founded in 2008 by Serhii Torenko and Mykhailo Zipunov, with the participation of Oleg Silin. The original idea was to create a platform for a contest of fantastic stories in the Ukrainian language, where the participants themselves would evaluate each other. It was decided to hold competitions twice a year. A mini-story contest, held every summer, was later added to the "big" contest. Among the currently well-known authors who participated in or won competitions were Igor Silivra, Nataliya Matolinets, Svitlana Taratorina, Dara Korniy, Natalka Lishchinska, and Vladyslav Ivchenko.

Over the past few years, twenty-seven major contests have been held, and more than two thousand short stories were submitted. The twenty-eighth was supposed to start on March 3, 2022, but due to the full-scale invasion of Russia, the competitions were put on hold.

Cooperation with the Kyiv Club of Fantasy Fans "Portal" helped the association to start master classes at conventions ("Portal," "Days of Fiction in Kyiv"). The winner of the competition and four to six participants selected by the administration had the opportunity to hear an analysis of their own story from an invited writer (literary critic). The first master was Maria Galina; among the other masters were Volodymyr Aryenev, Volodymyr Yeshkilev, Anton Sanchenko, Oleksandr Mykhed, and Serhiy Oksenyk. Master classes, as well as competitions, were held twice a year.

Since 2012, the association has begun to cooperate more actively with the country's general literary festivals – the Book Arsenal and the Lviv Forum of Publishers. At the Book Arsenal, Star Fortress later became the curator of a special program on SF. Further, SF events from Star Fortress were also held at the Zaporizhia and Severodonetsk book festivals, the Cherkasy Book Festival, and at four mass culture festivals: Yukon, Eastern Bastion, KyivSteamCon, and KyivComicCon.

After 2014, when the conventions of the old formation ceased to exist, the association began to hold master classes at general literary festivals, created a separate event around the master class, and also joined the creation of the LiTerraCon fiction festival, which was held from 2014 to 2017.

Star Fortress compiled two almanacs of fantastic stories based on the results of contests, and compiled the collections *Pocket Mandruary* (Travel Guide), *Travels by Fantastic Transport* (KM-Buks), *Independence Agency* (NK Bohdan), and *Legendary of Strange Cities* (Ranok).

Since 2020, the association's website has begun to cover many more events surrounding SF in Ukraine and the world, including presentations of books by Ukrainian authors, reviews of foreign awards, community initiatives related to SF, and so on. In addition, three special projects were launched on the website: the blog "Copyright in Your Own Words," a series of interviews with Ukrainian authors, "42 Fictions about the Incredible, Literature and Everything Else" (2020–2021), and

"Reading the Future Victory" (spring 2022). Since 2016, Oleg and Alyona Silin have represented the Star Fortress team.

Scientific Research

During these times, the first thorough study of "Ukrainian Science Fiction: Historical and Thematic Perspectives," an SF monograph by the Canadian researcher of Ukrainian origin Walter (Volodymyr) Smyrniw, appeared. The author worked on the book for several decades; the study was published in English in Switzerland in 2013. Separate sections were published by the author in the form of articles in Canadian and Polish scientific periodicals.

The analysis of works of Ukrainian fiction is grouped into blocks of topics: utopia, space travel, encounters with aliens, artificial creatures, humor in Ukrainian fiction, and a number of others. Some chapters are devoted to fantastic concepts or individual works of specific fantastic writers. At the end of the book there is an appendix, a selected bibliography of Ukrainian fiction compiled by Vitaly Karatsupa.

The author, Walter Smyrniw, traces the chronological development of Ukrainian fiction from its inception to the 1990s. A separate section is devoted to the harbingers of SF in Ukrainian literature. In contrast to similar Soviet studies, the book contains significant factual material that illuminates the history of the genre in the territory of Western Ukraine, which was part of Poland in 1919–1939, as well as the development of fantastic literature among the Ukrainian diaspora. Smyrniw discovered or brought back from oblivion numerous names of Ukrainian SF writers. On the basis of new materials, he made many innovative conclusions about how Ukrainian writers depict typical fantastic plots. For example, one of Smyrniw's very interesting remarks concerns the definition of original artistic thinking and the value of an artistic work:

> Not all of them [new SF writers] were talented or creative authors. In fact, a number of graphomaniacs appeared who only created imitation stories based on certain clichés and published them mainly in newspapers and magazines. At the same time, some extremely creative writers-innovators entered the literature and introduced many new themes and concepts into Ukrainian science fiction. (Smyrniw 2013, 379)

Smyrniw also made apt remarks about the two main trends in the development of Ukrainian fiction in the twentieth century:

- Positivism is most vividly represented by the works of Ihor Rosokhovatskyi, who sees the future of humanity in technological progress.
- In relation to the mysticism of Oles Berdnyk, who does not believe in technical progress, seeing the future can only be in knowledge and interaction with mystical entities that are not amenable to positive evidentiary research.

Neither Ukrainian Russian-language fiction nor the domestic SF literature of the 2000s and 2010s is considered in Walter Smyrniw's monograph.

Solomiya Khorob's dissertation (Khorob 2017) is dedicated to Ukrainian science fiction and presents the vectors of the genre's formations, providing grounds for arguing the following conclusions:

1. The concepts of "fiction" and "fantastic" are central to works with artistic conventions. The latter acts as a special type of thinking-feeling and artistic vision, introduced into literary circulation by French scientist, Tzvetan Todorov. It is justified that literary fiction in artistic practice is realized in two guises: fiction as a technique (in the form of a component, element, detail) in nonfiction texts and fiction as a concept (as the main thematic and genre-creating factor of the work).
2. There are three main genres: fantasy proper, SF, and fantasy. But, taking into account the tendency toward interpenetration of genres, their hybridization, we attribute utopia and dystopia to those phenomena that are already developing today in the direction of fiction.
3. Fiction as a literary concept is a dynamic metagenre with a clear dominance of the fantastic (unusual, unreal, mysterious, miraculous, conditional), which reflects, through the interaction of content and form, human and social problems, regardless of the time and space reflected by the writers. It further reflects the hero-characters (real-virtual, mythological, historical, fairy-tale, imaginary), which is mutually determined by means and methods of modeling an unusual world and its components.
4. The peculiarity of the genre of fantasy proper, the so-called pure fiction, is its function to violate the norms of reality, causing hesitation in both the reader and the characters of the work. Examples of this subspecies in contemporary red literature are the novel *Cave* by Maryna and Serhiy Dyachenko and the collection of short prose by Yaroslav Melnyk, *Why I Will Not Tire of Living*. In the works of these writers, the most noticeable thing is the artistic conventions they follow, that is, they have fantasy as their main feature. Despite this, hesitating between real and unreal, and between possible and unbelievable, in the end the reader/character accepts the writers' "rules of the game."
5. The framework of science does not allow realizing all aspirations and possibilities of technical/natural science intelligence; therefore, scientists resort to artistic creativity. Modern SF is represented by Viktor Savchenko's works *From the Afterlife – Incognito* (Savchenko 2003) and *Under the Sign of a Cricket* (Savchenko 2004), as well as Volodymyr Yeshkilev's *Shadow of the Predecessor* (Yeshkilev 2011). Both the author-scientist and the writer-humanitarian are based on the rational-fantasy concept, the harmonization of scientific and artistic discourses. Attention is paid to the ability of the authors to create plot–plot collisions with the ability to psychologize the thoughts and reflections of the main characters. The focus is on intellectual analysis and the illusion of the reliability of the simulated reality and the corresponding attributes.
6. Contemplating the fantasy novels of Marina and Serhiy Dyachenko and Volodymyr Aryenev, Khorob notes their connection with mythology, folklore, and history with a primate ritual over myth. There are irrational motives of sorcery and magic, which are also connected with the realistic method of

narration. Personal motivations are possible, and there is a binary ethical opposition of good and evil, as well as plot components, such as escape and consolation.

7. Based on the artistic experience of modern fantastic literature and the main provisions of receptive aesthetics, Khorob proves that utopia/dystopia develops within the framework of the fantastic metagenre. It was noted that the main criterion in utopia is a suitable idea based on the achievements of science and technology, spiritual and moral maxims, and fantastic fiction. All features are reflected primarily in the chronotopic section. When analyzing dystopia, we consider the example of fiction as a concept and fiction as a method (the novels of Yuri Shcherbak) (Khorob 2017).

Summary

Studying the history of Ukrainian SF, one cannot fail to notice how carefully it repeats all the twists and turns of Ukrainian history. It is worth remembering that any fiction is only an image of the surrounding reality, modified with the help of the postulates of positivism and mysticism. Such a strategy is not unique because any literary work is a modified image of reality, even one that is considered realistic. A realistic image is impossible due to natural reduction. The author simply cannot take into account all the elements of reality, but chooses only those that he remembers and considers more pleasant for himself than others. This is how Ukrainian SF writers work. In the 1920s and 1930s, they frantically promoted communism; in the 1940s and 1950s they began to depict the technological utopia of the times of communism, which had already arrived. In the 1960s they were fascinated by mysticism; in the 1970s and 1980s the Golden Age of Ukrainian SF came, a time that was without political propaganda, and that was soon replaced by existentialism and postmodernism. In the 1990s and 2000s, Ukrainian SF writers massively began to write novels in favor of Russian imperialism and the wildest forms of chauvinism. After 2010, a new generation appeared, educated in the latest examples of European and American metamodernism, which reached us through popular cinema and mobile internet usage. In the 2020s, a new Golden Age should come, which will repeat the success of the dead and almost forgotten authors of the 1980s. Although we do not remember them, the digital trace of their lives remains in online libraries, like a kind of dead city that lives without noticing its own death.

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DALMA LILLA DOMINEK, SZABOLCS CEGLÉDI, NÓRA BARNUCZ

The Study of Instructors' Digital Competence in Higher Education—Comparative Analysis

Studying the efficiency of information and communication technology (ICT) in education is a relevant issue today, as it is important to exploit the development of digital competence at all levels of education (Drent and Meelissen 2008). In this paper, the digital competence of teachers at the Ludovika University of Public Service (hereinafter: LUPS) (N=824) was investigated through the DigCompEdu self-assessment questionnaire. First, we hypothesized that, although teachers' digital competences may need to be improved, their motivation to use digital technologies in the classroom is positive. Second, we assume that independent variables (e.g., age, gender, having a doctoral degree) would affect the teachers' digital competences. According to the results, the majority of the teachers are open to integrating new ideas and methodological innovations in the classroom, willing to test new methods, and creative and critical in the use of different digital solutions.

Keywords: *information society, digital competence, higher education, methodological solutions*

Author information:

Dalma Lilla Dominek, Associate Professor, Ludovika University of Public Service, Faculty of Public Governance and International Studies, Department of Social Communication, senior researcher and head of the Experiential Digital Education Laboratory, Budapest, Ludovika Square 2. https://orcid.org/0000-0002-8460-640X

Szabolcs Ceglédi, Administrative Officer, Ludovika University of Public Service, Department of Innovation and Technology, researcher of the Experiential Digital Education Laboratory, Budapest, Ludovika Square 2. https://orcid.org/0009-0005-8186-9879

Nóra Barnucz, Assistant Lecturer, Ludovika University of Public Service, Faculty of Law Enforcement, Department of Foreign Languages for Specific Purposes, researcher and vice-head of the Experiential Digital Educational Laboratory, researcher of the ICT MasterMinds Research Group, Budapest, Üllői Street 82. https://orcid.org/0000-0001-7832-3465

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1. Introduction

Several national and international studies (Condie and Munro 2007; Buda 2020; Barnucz 2022) have examined how information and communication technology (ICT) tools can be used to implement educational reform. In the age of lifelong learning, information literacy is an essential ability for all information users, regardless of age. The importance of this has also been emphasized by Réka Racsko: "Without information and communication technology (ICT) literacy, we cannot be competitive in the 21st century labor market. We cannot meet the requirements of digital citizenship" (Racsko 2017, 43). Digital competence is one of the eight key competence areas created by the expert working group established by the Council of Europe in 2002 (Demeter 2006). These basic elements (key competencies) are part of all national core curricula of the European Union (Dringó-Horváth et al. 2020).

The rapid spread of the information society also raises the issue of digital inequality. Norris (2001) treated the issue as a multidimensional set of phenomena with global, social, and democratic dimensions. The present study focuses on the social dimension of the issue, which Norris (2001) defined as digital inequality within a given country or social group in terms of access, use, and competence. Furthermore, Norris (2001) found the social digital divide to develop along the following demographic indicators: income, education, age, ethnicity, and regional affiliation.

In our study, we examined the level of digital competence of the teachers at LUPS based on their own self-reported assessment, in addition to the digital divide that appeared to emerge among the listed socio-cultural factors, age, and other background variables, such as number of degrees or having a teacher qualification. Hargittai (2022) explained that, in relation to digital inequality, how users employ digital tools and content is of the utmost importance. The author is of the opinion that inequalities can be detected precisely in the differences in digital skills. To further describe this phenomenon, Hargittai (2022) coined the concept of the "second-level digital divide," which indicates that, while a user's age is negatively correlated with digital skills, solving tasks and searching for information on the Internet is viewed as an experience. However, the author's statement referring to age contradicts several studies (e.g., Török 2008; Hunya 2008; Buda 2010; Fehér and Hornyák 2010; Molnár 2010) that demonstrate that certain teachers have a higher level of digital competence than their students. According to Buda's (2017) digital generation theory, teachers are not digital immigrants but rather digital settlers, since they gladly and often use ICT tools. She stated that technological access alone is not enough to overcome digital inequality, as social differences also need to be considered (Hargittai 2002).

According to Horváth et al. (2020), in the development of students' digital competence, the task of the teacher (instructor) is to successfully navigate the digital space and to prepare for creative and safe activities. Furthermore, the development of key competencies through digital tools is in accordance with the expectations of the 21st century. Based on the above, the development of digital competence in higher education must be implemented on several levels, such as within the framework of IT education or through education integrated into specialized subjects (Dringó-Horváth et al. 2020). Teachers (instructors) can effectively support the digital competences of

their students if they can objectively assess and evaluate their own digital competences. After this self-examination, they can further develop their teaching methodology, making maximum use of the opportunities provided by ICT tools in the teaching-learning process (Botos, Botos and Barnucz 2023; Dominek et al. 2023). In addition to the individual responsibility of the teacher, systemic institutional support plays an equally decisive role in the development of digital competences (Dringó-Horváth et al. 2020). This approach includes training, curricula, and long-term strategic programs (European Commission 2018).

2. Theoretical background

2.1. Introducing the DigCompEdu framework

With the development of the information society and the emergence of technical and technological innovations, a constantly changing vision of the future is emerging. As such, the acquisition of knowledge must be adapted to meet the expectations of the accelerating information society, since lifelong learning and the development of competences are key to future survival. These expectations are particularly important in the education sector, since the training of future generations depends on their professional development and progress. In 2013, a new European framework for digital competence, the Digital Competence Framework for Citizens (hereinafter: DigComp), was developed in response to this rapidly and continuously changing environment. DigComp is the European reference framework for the interpretation and development of digital competence, thus providing a uniform interpretation of digital competences (Racsko 2017). The DigCompOrg (European Framework for Digitally Competent Educational Organizations) framework, which was created by the European Union in 2015 as a supplement to the DigComp framework, was specifically designed for educational organizations, emphasizing quality education with the help of digital technologies (Kampylis, Punie and Devine 2015). Further expansion of the existing DigComp framework was generated by technological and social changes, leading to the release of DigComp 2.0 in 2016 and version 2.1 in 2017. This latest framework includes a more detailed eight-level system supplemented with examples (Chira 2020). However, due to social peculiarities, it was not feasible to transfer the DigComp system to the Hungarian domestic environment (Racsko 2020). Therefore, the Infocommunications Uniform Reference Framework (IURF) was developed based on DigComp between 2015 and 2016. The system uniformly interprets digital skills, enabling the development of these skills along the same objectives (Racsko 2020) while providing an opportunity for users to determine their own level of digital competence. In 2017, considering the specifics of education, the European Commission developed the European framework for teachers' digital competence, DigCompEdu (Redecker 2017) (Figure 1). This framework was developed to determine the possibilities of using ICT technologies at all levels of education (Digital Pedagogical Developments Working Group 2019). The European framework "identifies the areas of digital competence that teachers and instructors need to develop in

order to effectively integrate digital technologies for educational purposes, and also makes it clear which areas are necessary for teachers to be able to adequately support students' digital development of competences" (Horváth et al. 2020, 7).

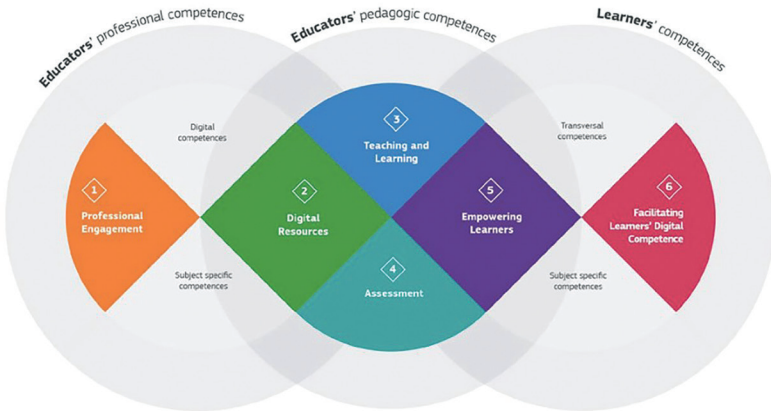

Figure 1: The main elements of teachers' digital competences based on the DigCompEdu competence areas (Digital Pedagogical Developments Working Group 2019, 1)

In Hungarian public education, the DigCompEdu framework was combined with digital competence expectations as defined in the Hungarian teacher qualification system (Digital Pedagogical Development Working Group 2019).

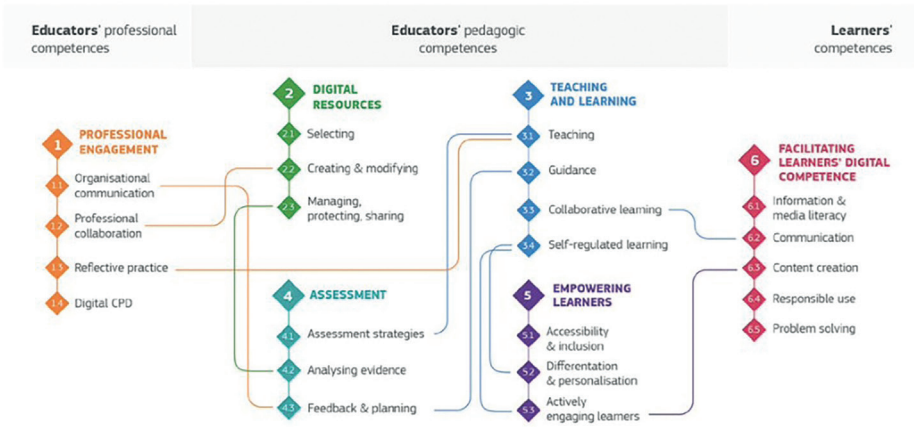

Figure 2: Subareas of the main competence areas based on the DigCompEdu framework (Digital Pedagogical Developments Working Group 2019, 2)

As a result, the DigCompEdu framework is defined by six competence areas (1. Professional Engagement; 2. Digital Resources; 3. Teaching and Learning; 4. Assessment; 5. Empowering Learners; and 6. Facilitating Learners' Digital Competence)[1], as well as 22 competence elements. Six different skill levels can be linked to these areas: A1 Newcomer, A2 Explorer, B1 Integrator, B2 Expert, C1 Leader, and C2 Pioneer. The sub-competences found within each competence area indicate an overlap between the individual competence areas, which is illustrated in Figure 2.

3. Empirical research

3.1. Presentation of the measurement tool

The research examines the digital competence of LUPS teachers within the framework of the tender program TKP2021-NKTA-51. The research consists of two interdependent stages: quantitative research (questionnaire) and qualitative research (focus group research for deep drilling). The data collection was carried out from December 2021 until February 2022. All teachers at the university received the online questionnaire (N=824 people), and 355 people completed the questionnaire. The data were coded and analyzed using SPSS. For this study, we used the version of the DigCompEdu questionnaire prepared by the Joint Research Centre of the European Commission and adapted for higher education by Horváth et al. (2020). We carried out an examination of the validity and reliability of the questionnaire; the data of the statistical procedures and the fit indicators were in the good or acceptable range. To establish the convergent validity of the measuring instrument, McDonald's omega value was used, where the heuristic threshold value of 0.7 was used as a basis. Therefore, a value above 0.7 was considered acceptable for the reliability index. According to the results, most of the scales have adequate internal consistency indicators, except for the "search for digital resources" area. However, as omitting the items of the mentioned area (3 items) does not increase the omega values, we did not consider it appropriate to delete them. The four dimensions of the self-rating questionnaire included a total of 45 questions. The four dimensions are: (1) background data; (2) IT data; (3) assessment of digital competence through the six competence areas of DigCompEdu; and (4) the question block about institutional support.

3.2. Presentation of the research, research questions, hypotheses

The purpose of the research is, firstly, to explore the relationship between teachers and the use of digital solutions in the classroom, as well as the teachers' development needs for digital competence. Furthermore, we aim to highlight the role of introducing experience-based digital training and methodology in furthering the

1 Instead of the original titles of the six competences, we use the following abbreviations in the statistical tables: comp1, comp2, comp3, comp4, comp 5, comp6.

aims of this research. During the study, we examined the level of digital competence the teachers at LUPS had according to their self-assessment, the factors that most influenced their level of digital competence, as well as their strongest and weakest areas of competence. According to our first hypothesis, the teachers' level of digital competence requires development, but their motivation showed a positive direction regarding the use of digital technologies in the classroom. In addition, we assume that significant differences can be statistically demonstrated between the average score on the competence areas and the independent variables, such as teacher qualification, gender, age, number of diplomas, having a doctoral degree, and average score on competence areas.

3.3. Characteristics of respondents

The majority of the respondents were men (65.1%), while 34,9% of the respondents were women of the respondents. Given the characteristics of LUPS, this ratio is representative of the current makeup of the faculty. Based on the age distribution, the age groups of 36–45 (sample: 31,10%; basic population: 30,49%) and 46–55 (sample: 31,69%; basic population: 30,25%) were represented in the largest proportion. The proportion of teachers in the older age groups is also significant, while the proportion of early career teachers aged 25–35 is negligible in the sample. According to the years spent teaching in higher education, there were smaller differences in the group sizes than for the age groups. However, it is important to note that 26.7% of teachers have been teaching for more than 20 years. In relation to age and the digital divide, we looked at the correlation between age and the digital skills score. Although no significant correlation could be detected between the two variables, the correlation was negative, displaying that the proficiency level of digital competence decreases with advancing age (Tódor 2022). It is interesting that two-thirds of the respondents do not have a teacher qualification. Concerning the number of degrees, among the instructors at LUPS, the highest proportion is made up of two-degree holders (42.2%).

3.4. The primary empirical results

The evaluation based on the self-classification of the Common European Reference Framework is illustrated using a cross table based on Horváth et al. (2020), which estimates the assessment of an individual's competence level by including two variables. Table 1 shows how the respondents felt about their own level of digital competence. The questionnaire asks the respondents to evaluate their own competence twice, at the beginning and the end of the assessment. The main idea behind this is to assess to what extent the respondents' self-evaluation changed after answering the questions. In the table, the percentage of those who rated themselves the same at the beginning and the end was marked in dark gray (diagonal area of the table). In the cases marked with the lightest gray color, the respondents judged their own

competence level more negatively at the end of the questionnaire (cells below the diagonal), while the darker gray color represents the opposite (cells above the diagonal).

Self-assessment of the level of digital competence		**After completing the questionnaire**					
Before completing the questionnaire	**A1**	**A1**	**A2**	**B1**	**B2**	**C1**	**C2**
	A2	0.7	1.0	0.0	0.0	0.0	0.0
	B1	0.7	9.5	1.3	0.7	0.0	0.0
	B2	0.0	4.9	14.1	3.3	0.0	0.0
	C1	0.3	2.3	9.5	33.9	2.6	0.0
	C2	0.0	0.0	0.3	3.3	4.9	0.3
	A1	0.0	0.0	0.7	1.0	1.0	3.6

Table 1: Self-classification of the competence of the respondents before and after completing the questionnaire (Source: TKP2021-NKTA-51; n=355 own editing, based on Horváth et al. 2020, 14)

Overall, 8.9% of the instructors improved their self-rating at the end of the questionnaire, while 24% decreased their ratings. 42.1% of LUPS teachers classified their competence level as B2 (expert), but a significant proportion also rated themselves in accordance with the B1 (integrator) level. The two extreme options, on the other hand, were chosen in an extremely low proportion (Figure 3).

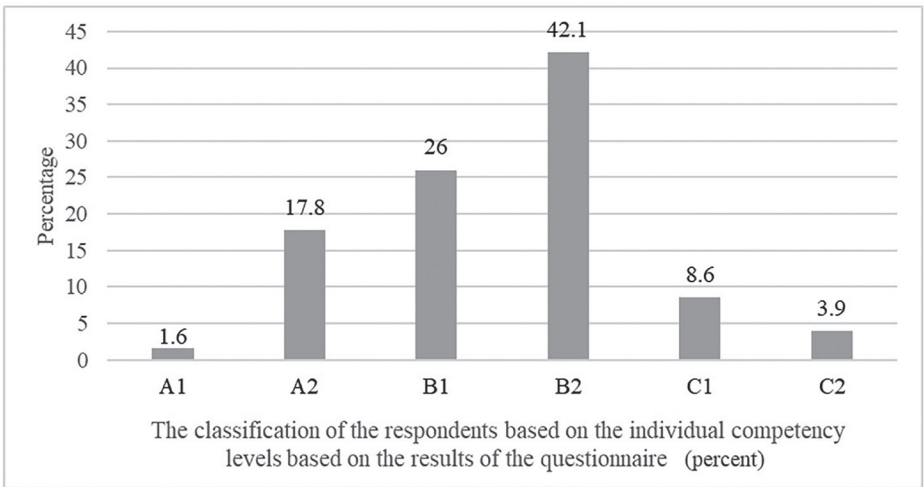

Figure 3: Self-classification of LUPS teachers (Source: TKP2021-NKTA-51; n=355, own editing, based on Horváth et al. 2020, 15)

Figure 4 illustrates the correlation between the six factor areas and the regression weight of the related sub-questions. According to our results, the strength of the correlation relationship between the factors is considered to be medium. Although the majority of the regression relationships can be classified as weak, they reached a medium strength in certain cases, especially in relation to the digital resources management factor.

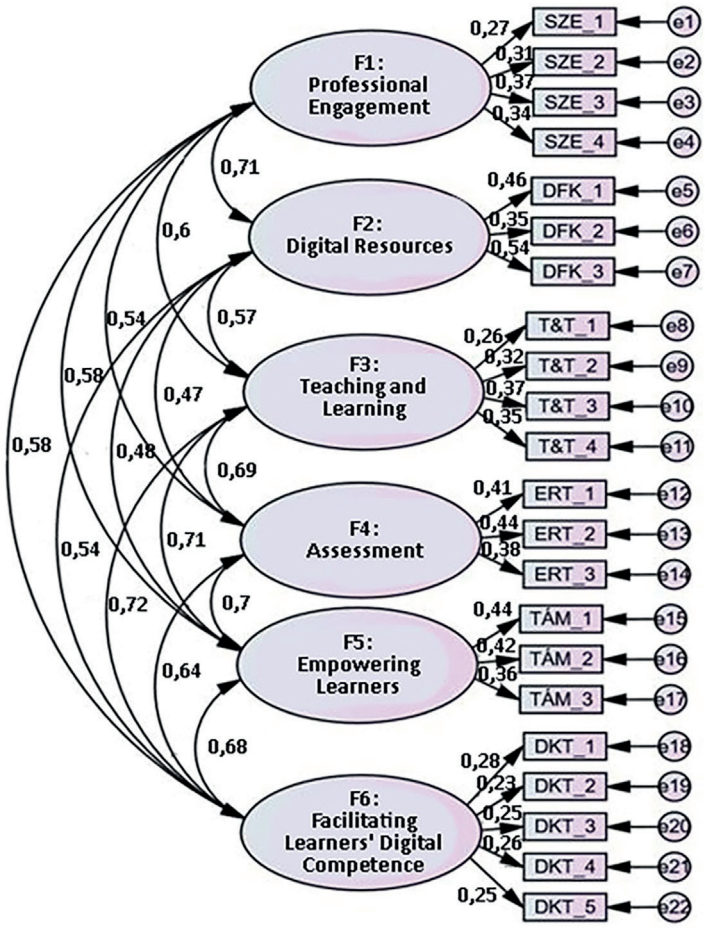

Figure 4: Factor structure of DigCompEdu (Source: TKP2021-NKTA-51; n=355, own editing, based on Horváth et al. 2020, 11)

The bar charts marked in Figure 5 illustrate the ratio of the average scores of the respondents in each of the six competence areas. Based on the data, the teachers mostly achieved the highest score (63.00%) in Digital Resources (comp2), while the lowest (52.14%) was in Assessment (comp4).

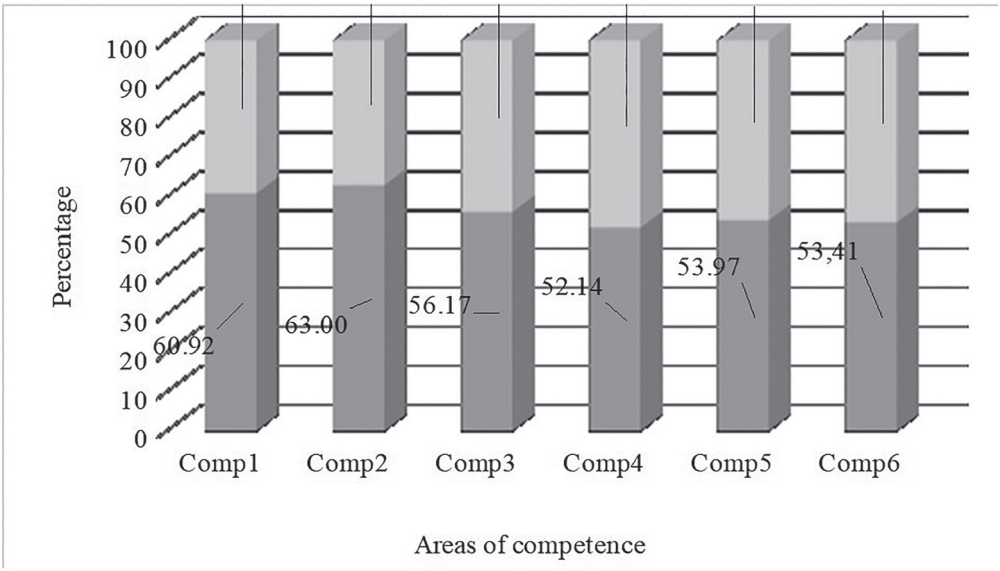

Figure 5: The percentage of scores achieved by the respondents in each area (Source: TKP2021-NKTA-51; n=355, own editing, based on Horváth et al. 2020, 16)

Differences by different aspects in the six areas of competence

Average points achieved by competence areas involving faculties

The average scores in each of the six competence areas illustrate which subgroups performed better in each area. However, it is important to bear in mind that, when presenting quantitative data, if there is no significant difference between two variables, it is equivalent to a research result as if there had been a difference. This finding can be applied to the four faculties[2] of the University of Public Service, as there is no difference in the six competence areas. In other words, belonging to any specific faculty does not make it more likely that an individual will perform better on any of the competences. As shown in Table 2, the average scores are the same or close to the same for all faculties. The standard deviations are minimal and do not lead to significant differences. Furthermore, it is worth noting that age also does not have a significant effect on the presence of competences. Thus, the younger groups in our sample are not shown to be more comfortable with digital tools than the older groups.

[2] 1. Faculty of Public Governance and International Studies (FPDIS); 2. Faculty of Military Sciences and Officer Training (FMSOT); 3. Faculty of Law Enforcement (FLE), 4. Faculty of Water Sciences (FWS).

Faculties of UPS		Comp1	Comp2	Comp3	Comp4	Comp5	Comp6
FPDIS	Mean	12.2043	9.7527	11.5495	8.1111	8.3182	13.5455
FMSOT	Mean	12.1379	9.3908	11.1341	7.5325	7.9259	12.7778
FLE	Mean	12.3131	9.5253	11.0816	7.7872	8.2083	13.6667
FWS	Mean	11.9268	8.7073	11.1000	7.8718	7.6750	13.3333

Table 2: Connection between academic degrees and average scores on competence areas. Source: TKP2021-NKTA-51; n=355

In the following step, we used non-parametric ANOVA to compare having a doctoral degree and the scores of the competences. Our results confirm that having a doctoral degree is a significant competitive advantage, and that these relationships can be generalized for the six categories of digital competences (Table 3). It was evaluated with the Dunn-Bonferroni Test, which compares the differences by pairs. The relevant categories are: Professional Engagement (comp1), Digital Resources (comp2), Teaching and Learning (comp3), Assessment (comp4) and Empowering Learners (comp5) (Tables 4–8). This means that having a doctoral degree is clearly a determining factor in achieving a higher score on the test.

Variables	Significance
Comp1 – doctoral degree	**0.006**
Comp2 – doctoral degree	**0.003**
Comp3 – doctoral degree	**0.008**
Comp4 – doctoral degree	**0.007**
Comp5 – doctoral degree	**0.003**
Comp6 – doctoral degree	**0.008**

Table 3: Significance of having a doctoral degree on competence areas. Source: TKP2021-NKTA-51; n=355; Kruskal-Wallis Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

It was evaluated with the Dunn-Bonferroni Test, which compares the differences by pairs. The relevant categories are: Professional Engagement (comp1), Digital Resources (comp2), Teaching and Learning (comp3), Assessment (comp4) and Empowering Learners (comp5) (Tables 4–8). This means that having a doctoral degree is clearly a determining factor in achieving a higher score on the test.

Doctoral Degree	Test Statistic	Adjusted Significance
Yes – No	32.308	0.056
No – I am a doctoral student.	-50.877	**0.004**
Yes – I am a doctoral student.	-18.568	0.420

Table 4: The comparison of having an academic degree and Professional Engagement (comp1). Source: TKP2021-NKTA-51; n=355; Dunn-Bonferroni Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

Doctoral Degree	Test Statistic	Adjusted Significance
Yes – No	40.735	**0.009**
No – I am a doctoral student.	-51.963	**0.003**
Yes – I am a doctoral student.	-11.228	1.000

Table 5: The comparison of having an academic degree and Digital Resource (comp2). Source: TKP2021-NKTA-51; n=355; Dunn-Bonferroni Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

Doctoral Degree	Test Statistic	Adjusted Significance
Yes – No	40.510	**0.009**
No – I am a doctoral student.	-42.143	**0.023**
Yes – I am a doctoral student.	-1.633	1.000

Table 6: The comparison of having an academic degree and Teaching & Learning (comp3). Source: TKP2021-NKTA-51; n=355; Dunn-Bonferroni Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

Doctoral Degree	Test Statistic	Adjusted Significance
Yes – No	23.660	0.195
No – I am a doctoral student.	-47.596	**0.005**
Yes – I am a doctoral student.	-23.936	0.142

Table 7: The comparison of having an academic degree and Assessment (comp4). Source: TKP2021-NKTA-51; n=355; Dunn-Bonferroni Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

Doctoral Degree	Test Statistic	Adjusted Significance
Yes – No	34.772	**0.029**
No – I am a doctoral student.	-53.221	**0.002**
Yes – I am a doctoral student.	-18.449	0.389

Table 8: The comparison of having an academic degree and Empowering Learners (comp5). Source: TKP2021-NKTA-51; n=355; Dunn-Bonferroni Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

In another statistical procedure (Mann-Whitney U Test), we studied the connection between teacher qualifications and average scores on competence areas. The results below show that having a teacher qualification has no effect on performance in different competence areas. An exception is the category of Empowering Learners (comp5), where the presence of a teacher qualification is likely to lead to

significantly higher levels of support (Tables 9–10) (p=0.025); despite previous perceptions, the existence of a teacher qualification is essentially irrelevant to the quality of the use of digital methods in the classroom.

Competences	Teaching qualification	N	Mean Rank	Sum of Ranks
Comp 1	Yes	113	159.22	17992.00
Comp 2	Yes	113	151.55	17125.50
Comp 3	Yes	109	165.94	18087.00
Comp 4	Yes	102	150.88	15389.50
Comp 5	Yes	108	**168.19**	18165.00
Comp 6	Yes	107	161.41	17270.50

Table 9: The comparison of having a teacher qualification and the average score on competence areas. Source: TKP2021-NKTA-51; n=355; Note: ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6
Mann-Whitney U Test	11551.000	10684.500	9926.000	9141.500	8997.000	9586.500
Asymp. Sig. (2-tailed)	0.854	0.198	0.151	0.462	**0.025**	**0.192**

Table 10: Significance of teaching qualification on competence areas. Source: TKP2021-NKTA-51; n=355; Mann-Whitney U Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

Connection between gender and average scores on competence areas

The Mann-Whitney U test was applied to test the average differences between gender and the average scores on competence areas. While the average scores for the six categories do not significantly differ by gender in most cases, men perform significantly better than women in Facilitating Learners' Digital Competences (comp6—p=0.019) (Tables 11–12). This means that, in general, members of one gender are not considered to be better than the other in the competence areas.

	Gender	N	Mean Rank	Sum of Ranks
Comp 1	Male	208	164.92	34303.00
	Female	112	152.29	17057.00
Comp 2	Male	208	165.82	34490.00
	Female	112	150.63	16870.00

Comp 3	Male	203	163.17	33122.50
	Female	108	142.53	15393.50
Comp 4	Male	190	149.06	28321.50
	Female	101	140.24	14164.50
Comp 5	Male	198	155.34	30758.00
	Female	107	148.66	15907.00
Comp 6	Male	197	161.17	31750.00
	Female	107	136.54	14610.00

Table 11: The comparison of gender and average scores on competence areas. Source: TKP2021-NKTA-51; n=355

	Comp1	**Comp2**	**Comp3**	**Comp4**	**Comp5**	**Comp6**
Mann-Whitney U	10729.000	10542.000	9507.500	9013.500	10129.000	8832.000
Asymp. Sig. (2-tailed)	0.242	0.158	0.053	0.389	0.524	**0.019**

Table 12: Significance of gender on competence areas. Source: TKP2021-NKTA-51; n=355; Mann-Whitney U Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

Connection between the number of diplomas and average scores on competence areas

The Kruskal-Wallis and Dunn-Bonferroni Tests were used to compare the differences between the number of diplomas and the average scores on competence areas. Our analysis confirms that, in several cases, the number of diplomas is correlated with the average scores in the competence areas. This is supported by significant results in the areas of Teaching and Learning (comp3 – p=0-000); Empowering Learners (comp5—p=0.009); and Facilitating Students' Digital Competences (comp6—p=0.001) (Table 13). This means that, in many cases, people with more diplomas are more likely to score better on the test.

Variables	**Significance**
Comp1 – the number of diplomas	0.429
Comp2 – the number of diplomas	0.604
Comp3 – the number of diplomas	**0.000**

Comp4 – the number of diplomas	0.074
Comp5 – the number of diplomas	**0.009**
Comp6 – the number of diplomas	**0.001**

Table 13: Significance of the number of diplomas on competence areas. Source: TKP2021-NKTA-51; n=355; Kruskal-Wallis Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

In the area of Teaching and Learning (comp3), it was confirmed that those with three diplomas scored better than those with one or two diplomas (Table 14). A similar correlation was found in the area of Empowering Learners, where those with three diplomas also scored better than those with one diploma (Table 15). Furthermore, in the area of Facilitating Students' Digital Competences (comp6), participants with three diplomas scored higher than those with less than one (Table 16). Therefore, the above suggests that, in many cases, those with more diplomas are better able to use digital tools to support lessons. However, our results suggest that, above three diplomas, there is no significant effect of the number of diplomas on the scores achieved.

The number of diplomas	**Test Statistic**	**Adjusted Significance**
1-3	-62.285	0.000
2-3	-48.462	0.004

Table 14: The comparison of the number of diplomas and Teaching & Learning (comp3). Source: TKP2021-NKTA-51; n=355; Dunn-Bonferroni Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

The number of diplomas	**Test Statistic**	**Adjusted Significance**
1-3	-45.227	0.025

Table 15: The comparison of the number of diplomas and Empowering Learners (comp5). Source: TKP2021-NKTA-51; n=355; Dunn-Bonferroni Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

The number of diplomas	**Test Statistic**	**Adjusted Significance**
1-3	-59.441	0.001
2-3	-39.435	0.035

Table 16: The comparison of the number of diplomas and Facilitating Learners' Digital Competence (comp6). Source: TKP2021-NKTA-51; n=355; Dunn-Bonferroni Test ***: P ≤ 0.001, **: P ≤ 0.01, *: P ≤0.05

4. Summary

The first step of the research was to map the level of digital competence of the teachers at LUPS. With reference to the present sample, it can be said that the participants evaluated their own digital competence at the B1–B2 level on average. In terms of the level of digital competence, inequalities can be detected; this is also displayed by the examined teachers mostly being able to utilize the benefits of ICT tools to manage digital content, while the area of evaluation showed a need for improvement. The scores achieved in the other areas indicated the teachers' openness to digital technology-based education, which could be positively influenced by university training offers to reduce digital inequalities (Tódor 2022). The first hypothesis—that although the digital competence of the teachers at LUPS requires development, their motivation shows a positive direction in terms of their use of digital technologies in the classroom—was confirmed. Many of the teachers rated themselves at the B2 level, which implies that they enjoy using ICT tools in their work; use many digital technologies confidently, creatively, and critically; choose applications appropriately; and are curious and open to new ideas (Redecker 2017; Dominek and Barnucz 2022). Second, the hypothesis that the independent variables (age, gender, having an academic degree, teacher qualification, etc.) would affect the teachers' digital competence was confirmed. The results indicated that the number of diplomas and having a doctoral degree can play a major role in digital competences, while gender and teacher qualifications have no significant effect. In addition, the proficiency level of digital competence was found to decrease with advancing age.

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