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The place of intuition in the digitalized world

Miejsce intuicji w zdigitalizowanym świecie

ABSTRACT

Intuition is understood in the article as the intelligence of the unconscious, taking into account all the information possessed by the subject as well as individual abilities and preferences. Intuition makes itself felt in various ways. It cooperates with consciousness when more important decisions are to be made or directly controls the behavior of an individual (in case of so-called operational intelligence). The author reflects on the role of intuition in the digitalized world and comes to the conclusion that digital technology partially replaces intuition's function but at the same time limits and blocks its development. He also notes that the concept of intuition in experimental psychology has been wrongly narrowed to spontaneously used heuristics in response to irrelevant questions, which usually leads to biased, inaccurate assessments. Finally, the suggestion appears that there is an analogy between human intuition, treated as the intelligence of the unconscious, and the direction of development of artificial intelligence. The use of the deep machine learning means that we know less and less about the processes taking place in the "black box," which often leads to spectacular [? disastrous/bad] results. The term digital intuition seems to be an adequate description of this state of affairs. The common denominator of human and digital intuition is that information processing – although it leads to the desired effects – remains inaccessible to both the subject's consciousness and the user (or even the designer) of the intelligent machine.


Keywords: availability of cognitive resources, unconscious intelligence, variety of intuitive signals, operational intuition, digital intuition

STRESZCZENIE

Intuicja rozumiana jest tutaj jako inteligencja nieświadomości, uwzględniająca całość posiadanych przez podmiot informacji oraz indywidualnych zdolności i preferencji. Intuicja daje o sobie znać na różne sposoby. Współpracuje ze świadomością przy podejmowaniu ważniejszych decyzji lub działa bezpośrednio, sterując zachowaniem jednostki (tzw. inteligencja operacyjna). Autor zastanawia się nad rolą intuicji w ucyfrowionym świecie i dochodzi do wniosku, że technologia cyfrowa częściowo zastępuje jej funkcję, lecz zarazem ogranicza i blokuje jej rozwój. Zauważa, że pojęcie

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intuicji w psychologii eksperymentalnej zostało niesłusznie zawężone do spontanicznie wykorzystywanych heurystyk w odpowiedzi na nieistotne pytania, co zwykle prowadzi do tendencyjnych i nietrafnych ocen. Na koniec autor wysuwa sugestię, że istnieje pewna analogia pomiędzy ludzką intuicją, traktowaną jako inteligencja nieświadomości, a kierunkiem rozwoju sztucznej inteligencji. Stosowanie tzw. głębokiego maszynowego uczenia sprawia bowiem, że coraz mniej wiemy o przebiegu procesów zachodzących w „czarnej skrzynce”, prowadzących często do spektakularnych wyników. Termin *digital intuition* wydaje się adekwatnym określeniem tego stanu rzeczy. Wspólnym mianownikiem ludzkiej oraz cyfrowej intuicji jest to, że procesy przetwarzania informacji, choć prowadzą do pożądanych efektów, pozostają niedostępne zarówno dla świadomości podmiotu, jak i dla użytkownika (a nawet konstruktora) inteligentnej maszyny.

Słowa kluczowe: dostępność zasobów poznawczych, inteligencja nieświadomości, różnorodność przejawów intuicji, intuicja operacyjna, intuicja cyfrowa

Intuitive machines will require more than trust: they will require faith.

(Editorial, 2016)

INTRODUCTION

The expansion of digital technology has changed (and continues to change) the living conditions on our planet, leaving its mark on all areas of life. The fact that we live “in the connected world” has many consequences. In addition to its undoubted advantages, this also means that everyone who owns a smartphone or a similar device operates on an “electronic leash”, and many users have become highly addicted to it. Let us add that in 2021, the number of smartphone users was estimated at 3.6 billion.

The negative aspect of “being connected” is that it consumes a lot of attention resources, provokes multitasking, and the signal of a new message or telephone conversation disrupts the ongoing activity and sometimes causes unfortunate events. We have known about some of them for a long time – it is known that, among others: is the cause of many road accidents. Even when using the “out of hand” version, it leads to a narrowing of the attention span, the resources of which are undoubtedly limited, although many supporters of multitasking do not seem to believe that this also applies to them personally.

The results of an experiment conducted on a group of 520 students at an American university are very telling (Ward *et al.*, 2017). The subjects performed two tests requiring the use

of their cognitive abilities, i.e. working memory capacity and the so-called fluid intelligence, measured by the Raven’s matrices test. The participants in the experiment were randomly assigned to one of three groups. In the first group, their silent smartphones were “on the desk” within sight, in the second group, “in their pocket or bag” in the same room, and in the third group, “in the next room.” There were significant differences between groups in the test results. The poorest results were achieved by the first group, whose smartphones (although turned off) were on the desk within sight. The difference between the group “on the desk” and the group in the “other room” turned out to be significant at the level of $p < 0.01$. In the next experiment, the degree of addiction to this device was additionally controlled. It turned out that people who declared higher dependence on their smartphone in the questionnaire had significantly worse results than people who were less dependent. Finally, participants were also asked (using a 7-point scale) whether they thought about their smartphones during the experiment. Interestingly, 75.8% of respondents claimed that they did not think about them at all.

It turns out that not only the sound of the phone is a disturbance that, by absorbing our attention, reduces the effectiveness of our activities, but even the presence of a turned off device

that is in the field of perception. In turn, other studies showed that in a group of users who intensively use their “mobile devices,” the level of anxiety increased with the passage of time “being disconnected” from the Internet (Cheever *et al.*, 2014). In still others other studies with a rather complex procedure, it was shown that the experimental subgroup in which participants not might react to possible signals of their mobile was characterized by worsened task performance, increased anxiety levels, increased blood pressure and increased heart rate (Clayton, Leshner, Almond, 2015). These results were interpreted in relation to the concept of the “extended self,” which suggests that in the case of more intensive users, their phone, or rather a multifunctional mobile device, is experienced as an extension of themselves (Belk, 1988).

It seems that being a chronic recipient of (pseudo)information and a kind of “network operator” has an impact on the availability of internal information, especially information relating to personal experiences. We are constantly dealing with something like a decontestation-alization of existence (Mudyń, 2010). Our attention is often in the virtual world (perhaps in Neverland), while the body and some senses are immersed in another, three-dimensional physical space.

PURPOSE OF THE STUDY

The question arises whether and to what extent long-term functioning “in the connected world” may affect the availability and effectiveness of our intuition. It should be added that intuition is understood here quite broadly, i.e. as “unconscious intelligence,” using all the cognitive resources of an individual (including the effects of implicit learning) in the context of important decisions. An important feature of intuition, apart from the use of unconscious resources, seems to be its holistic nature. The intuitiveness of a given decision is most convincingly demonstrated when it is made despite the knowledge of rational arguments that conflict with it, suggesting its irrationality. The indicated way of understanding intuition goes beyond its understanding appearing in the context of experimental psychology,

where the intuitiveness of assessments is identified with their spontaneity and immediacy in relation to issues that are trivial and irrelevant to the subjects. If we assume that an important (or perhaps the most important) feature of intuition is its holistic nature, referring to the entire experience of an individual, taking into account his or her abilities and preferences, then it is not easy to study it empirically in the format of a laboratory experiment. Some new paradigm is needed here. The author doesn't have it either. Perhaps, however, the presented investigations will contribute to proposing a promising research project.

INTERNET VS INTUITION AS COMPETING RESOURCES

What could the Internet and intuition have in common? It might seem that these are two very different, incommensurable areas of reality that have nothing in common. However, their common denominator can be noticed if we recall the rather abstract concept of resources. Well, we can say that the Internet gives users access to virtually unlimited external information resources, while thanks to intuition we gain access to internal cognitive resources. According to popular belief, everything is on the Internet, and if it's not there, it probably doesn't exist. The key issue is that accessing external resources contained on the Internet is incomparably easier (almost immediate access) than searching internal resources. This circumstance raises concern because it discourages the use of internal resources and receiving and taking into account signals coming from the subconscious.

Another problematic issue is the quality of information contained on the Internet. Can you find answers to “important questions” there, or rather information about all products and services that effectively cut through the overwhelming information noise?

Let us also note that intuitive premonitions or somatic signals are highly individualized. They are a form of a hint to the default question – what is good, harmful or threatening for an individual (at a given moment). However, electronic media try to address their messages to the widest possible group of potential recipients. They claim

to convey “universal truths.” Of course, here we are also dealing with “personalization” of the transmitted content, based on archived records of a given user’s previous activity. This is clearly visible in the form of personalized ads and other marketing incentives. This information reminds the user of his history – who he was, what he was interested in, what he was looking for and what he bought. In a sense, this provokes him to “self-repeat” behavior and maintain his previous identity.

However, intuitive signals or messages concern the current situation “here and now,” taking into account the current state of the individual’s mind and body. Is it better to turn right or left? Agree or refuse? Now or later? Should you trust person X or rather keep your distance? Is an attractive goal within my capabilities, despite rational counterarguments? In short, intuition prompts are individualized and focused on the individual’s well-being, while web browser prompts “profile” the individual’s past-oriented activity, based on his or her past choices.

WHAT IS INTUITION?

Intuition is not a concept whose boundaries can be precisely defined. The shortest answer is contained in the title of Gerd Gigerenzer’s book *Gut Feelings. The Intelligence of the Unconscious* (2008). In academic psychology, there has only recently been a consensus that our behavior is, to a large extent, controlled by cognitive processes that take place below the threshold of consciousness. The vast majority of our judgments and decisions in everyday life are made not on the “stage of consciousness,” but “behind the scenes,” in the words of David Myers (2004). Consciousness most often only “authorizes” these assessments and decisions, which are carried out without its participation. He intervenes mainly in crisis situations or when the type of task (problem) clearly refers to analytical cognitive processes. The lack of time pressure is also important, which favors reflection.

It can be said that intuition, which most often manifests itself in the form of premonitions that are difficult to specify and impossible to rationally justify, is a mediator between the unconscious and consciousness. These are difficult

mediations because awareness requires rational arguments or even evidence. He asks difficult questions like “How do you know?” Intuition, being the result of “unconscious intelligence,” is unable to provide a satisfactory answer to such questions. Intuition is precisely the fact that we have the feeling that we know something but we do not know how we know it (and how we can know it at all). Intuition also manifests itself in the fact that we do not know that we know something, but we nevertheless behave effectively and adequately to the requirements of the situation (Agor, 1988).

Intuition is not infallible. First, because it is not easy to separate it from the feelings that represent (and protect) our subjective beliefs and preferences. There is talk of the so-called “wishful thinking,” but in fact we should rather talk about wishful feelings and predictions formulated under their pressure. The easiest way to notice this is to ask football fans about the result of the match that “their team” will play. Secondly, consciousness and unconsciousness function on different principles and are governed by different rules. Consciousness works analytically and sequentially, intuition is based on a global, somewhat holistic (analog?) “assessment” of the situation. And since we are dealing with two different and rather untranslatable languages, it is easy for misunderstandings to occur. For example, it is believed that the unconscious does not understand negation or the passage of time. More cautiously, the unconscious is closer to the “eternal now” than to a linear understanding of time. Moreover, intuition expresses itself in various ways, using different “languages” in contacts with consciousness, sometimes deliberately bypassing it.

For the sake of order, it is also worth noting that intuition is a very capacious and expansive concept. When we talk about intuitive, i.e. global and rapid information processing, ending with a hasty reaction or assessment, then “intuitive” means more or less the same as “spontaneous.” However, at the other extreme there are, among others, spectacular premonitions that allow you to avoid impending danger or other unusual phenomena, described in the context of the so-called altered states of consciousness. And then “intuition” takes on connotations close to extrasensory

perception or unconventional communication. Such events justify the metaphorical descriptions of intuition as the “sixth sense” or guardian angel.

THE INTERNET AS AN ENVIRONMENT AND A “NATURAL EXTENSION” OF THE USER

In a sense, we all know what the Internet is. It is as familiar as television. We know well how to turn on the TV, but not many people can explain how this magic works, thanks to which “moving images” can be transmitted remotely. As for the Internet, it is worth emphasizing that over its over 30-year history it has undergone an accelerated and radical evolution. At the beginning of the 1990s (due to technical reasons that made access difficult), the group most exposed to Internet addiction disorder were male students representing technical or exact fields of study. Then gender and education ceased to matter, and even later the age limit was successively lowered until preschool age.

Nowadays, virtual reality and Internet content have become the most important part of the natural environment for many people. In the past, two competing metaphors were often used when referring to the Internet. The first of them compares the content of the Internet to the largest garbage dump, the second to the largest library in the world. In a sense, the synthesis of both metaphors is the short story by Jorge L. Borges entitled *The Library of Babel*, written in 1941. The author wrote as follows:

The Library is total and its cabinets record all possible combinations of these twenty-odd orthographic symbols (...) a detailed history of the future, autobiographies of archangels, a faithful catalog of the Library, thousands of false catalogues, a demonstration of the falsity of the true catalogue, the Gnostic Gospel of Basilides, a commentary on this gospel, the true account of your death, translations of all books into all languages, interpolations from every book in all books (Borges 1996, p. 4).

The next sentences also sound prophetic:

When it was announced that the Library included all books, the first impression was one

of immense happiness. All people felt they were masters of the untouched and secret treasure. There was no personal or worldly problem for which the detailed solution did not exist in some hexagon. The universe was justified, the universe suddenly took on the limitless dimensions of hope (Borges 1996, p. 5).

I remember that similar enthusiasm accompanied the first phase of the development of the Internet.

Nowadays, the Internet is not only about databases, repositories, electronic books and magazines. These are rather online stores, services and the so-called social media. Despite the nice name, it is the media that seem to be largely responsible for difficult access to subjective internal resources and the (probable) decline of intuition. By offering a substitute for a sense of belonging, social networking sites become an (artificial) frame of reference for young people. Moreover, through the so-called influencers, become a mouthpiece for commercial propaganda. For very young users, they become role models, authorities, determinants of new trends and changing fashion. Fashion is not only about lifestyle, but even more about having things that prove it; “must have” things. Following the artificial image of influencers is stultifying, often unhealthy and expensive. A model example is the phenomenon of Barbie, about whom someone said that although she has already reached retirement age – “she was born” in 1958 – but she still looks underdeveloped. Although Barbie was born in the era of BC (before computer) and perhaps this is why it owes its longevity (in part). However, modern fashions promoted by influential Youtubers have a shorter lifespan, but they “infect” young Internet users more quickly.

A Mexican proverb says that children are not raised by their parents, but by the entire village. To paraphrase, it can be said that in the “global village” children are not raised by their parents but via the Internet, especially through social networking sites and peer pressure. Parents, making every effort to meet the needs of their children, meet their artificial needs, forced by the pressure of peer fashion. And as Wisława

Szymborska noted: "People get stupid in bulk, but they get wiser individually."

The digital revolution is – of course – not only the Internet. This is an expansion of the so-called artificial intelligence in all areas of social and private life. This, among others virtual conversational agents, acting as agents in telephone contacts with institutions, provide algorithmic customer and supplicant service. It is also simplified and superficial communication in the form of memes and text messages. However, all this leads to information overload, progressive proceduralization of activities and uniformity of messages. Virtual availability also entails pressure (or temptation) on the part of the recipient of the message to respond immediately (Caird *et al.*, 2008). The electronic mediatization of interpersonal contacts certainly does not favor the development of emotional and social intelligence. In the case of children, this produces symptoms that are sometimes referred to as "virtual" or "pseudo-autism" (Kumaraswamy, Binoe, 2022; Ogonowska, 2024), because these symptoms are difficult to distinguish from the autism spectrum, despite the lack of a neurological basis. It is also worth mentioning that the German psychiatrist, in reference to the results of empirical research regarding, among others, empathy, he proposed the term "digital dementia" a long time ago (Spitzer, 2013).

A VARIETY OF INTUITIVE MESSAGES

Intuition manifests itself in different ways. It depends on the cognitive and personality preferences of the individual and the nature of the problem that concerns and engages him. Formally speaking, one could say that intuition messages are sensory (usually pictorial), emotional (e.g. unjustified distrust or anxiety, feeling that "something is wrong") or verbal (inner voice). However, this does not exhaust all modalities and ways of operating intuition. Among the sensory messages, we can distinguish (in addition to the appearing images or sounds) kinesthetic experiences. This may be a rumbling in the stomach (suggesting, for example, that we are nervous for unknown reasons), tingling in some part of the body, an unjustified feeling of shortness of breath

or other somatic symptoms. Antonio Damasio (2013) once proposed a collective term for these types of sensations, speaking of "somatic markers." In turn, Witold Dobrołowicz believes that it is justified to contrast "intuitive signals" with conventional signals (2019, p. 13–134). A good example of this type of signals is provided by the outstanding investor, George Soros, in his book *The Alchemy of Finance...*, writing:

I react to events on the market the way an animal reacts to events in the jungle. (...) I was usually able to predict impending disaster because it manifested itself in the form of back pain. Of course, I couldn't predict what shape the catastrophe would take... (Soros, 1996, p. 324).

For people engaged in creative activity, prompts appear both in dreams and while awake. Dmitri Mendeleev, after many months of hard work on the problem, saw the finished periodic table in his dream. In similar circumstances, the chemist Kekule saw the structure of the benzene molecule (Nalczażdzjan, 1979). Composers sometimes wake up with an almost ready melody, and poets with a ready ending to a poem (Goldberg, 1998). This is not surprising, because neither external stimuli nor the absorption of consciousness interfere with the unconscious processing of information programmed to solve the problem. Erich Fromm called dreams a "forgotten language" and (like other representatives of psychoanalysis) he considered the content of dreams to be a significant, although difficult to read, message coming from the unconscious.

The autobiographical revelations of creators, from mathematicians to poets, reveal a typical pattern of cooperation between consciousness and unconsciousness (cf. Goldberg, 1998). It begins (especially in the context of scientific discoveries) with conscious collection of information and persistent attempts to solve the problem (*the preparation phase*). Then there is a break resulting from fatigue, discouragement or the recognition that the problem is probably unsolvable. This period is usually called *the incubation phase*, although the term conscious resignation also seems justified. With a bit of luck, the process ends

with the *illumination phase*, i.e. the unexpected appearance of an idea that turns out to be tantamount to solving the problem. There is still a certain formality left, i.e. checking the accuracy of the idea (*the verification phase*). Although the moment of illumination is unpredictable, it is not accidental. The rule is that it does not appear during intentional work on a problem, but during a different, unrelated activity that combines relaxing circumstances with low-absorbing physical or mental activity.

OPERATIONAL INTUITION

In addition to the above-mentioned methods of communicating the unconscious through feelings, somatic experiences and cognitive content (images, sounds, voices), another manifestation of its presence should be distinguished, which involves the direct intervention of unconscious processes in the way an individual reacts and in the course of his or her behavior. Philip Goldberg in his article *The multifaceted nature of intuition* proposes the term *operational intuition*. As an illustration, he recalls a situation from World War II in which Winston Churchill participated. In 1941, when London was under siege, he routinely visited an anti-aircraft battery position in the evening in his staff car, which involved considerable risk. One evening, when he was about to leave the artillery positions, the chauffeur opened the car door for him, the same as always. However, this time, the Prime Minister stopped, walked around the car and got in from the other side. A moment later, a bomb exploded on the passenger side, which he did not use, almost overturning the car.

Commenting on this event, Goldberg writes:

Churchill had what I would call operational intuition (...) This most subtle, almost spiritualistic form of intuition is what leads us this way and that way, sometimes forcefully, sometimes gently, gracefully. It warns us without saying why, and sometimes we don't even know that something has warned us. It is more like a sense of direction than a map... (Goldberg, 1998, p. 91–92).

By the way, I knew someone who, during the World War II, for no reason, perhaps due to some unspecified anxiety, left his workplace at noon, which surprised him greatly. A few minutes later, as part of a roundup, all employees were surrounded, taken away and shot.

Therefore, it seems that intuition sometimes works quite directly, as if using a “shorter path,” i.e. bypassing emotional, cognitive and somatic “support” for executing a given reaction that is in contradiction with an established habit or implemented intention. It is also known that some “errors” of our awareness after the fact turn out to be quite fortunate. As long as they are not treated as a regrettable failure. By the way, Sigmund Freud introduced the concept of error activities (Freudian slips) meaning forgetting, getting lost and slipping the tongue. The founder of psychoanalysis saw in them manifestations of the activity of the unconscious. However, he did not treat them as manifestations of benevolent intuition, but rather as symptoms of unconscious motivation, because this was the main subject of his interests. However, he emphasized the purposeful nature of the mistaken actions. It is possible that operational intuition can be traced to many erroneous actions. As an example, let's assume that someone (who is always on time) is late for a plane. An annoying situation. A little later, it turns out that the plane crashed and everyone died. Depending on the accepted vision of reality, we can consider this event as just a coincidence or a manifestation of intuition.

THE CONCEPT OF INTUITION IN EXPERIMENTAL PSYCHOLOGY

The understanding of intuition in the context of experimental, i.e. academic, psychology has been significantly narrowed due to the dominant methodology of research on cognitive biases and the widespread, thanks to Daniel Kahneman (2012) the concept of two information processing systems, the so-called fast and slow thinking. The extremely elegant experiments in which Kahneman and Tverski and other researchers asked participants closed-ended questions usually required a numerical answer (as in the case of the anchoring effect). When the question is

simple and concerns an issue that is unimportant to the subject, and the experimenter expects a quick answer, stereotypical ideas and beliefs are the first to emerge. Especially if it concerns issues unrelated to the personal experience of the respondents. Even more so if the task is analytical in nature, requiring manipulation of numbers or sophisticated reasoning. No wonder then that the so-called intuitive judgments, synonymous with spontaneous reactions, usually turn out to be inaccurate.

According to the until recently undisputed concept of two processes (information processing), the first one, called intuitive, is fast, automatic, unconscious and “effortless,” while the second one, called deliberative or reflective, is time-consuming and energy-intensive (effortful). However, in recent years, the above-mentioned scheme has been increasingly questioned (e.g. Thompson, Pennycook, Trippas, 2018; De Neys, Pennycook, 2019). Heuristic intuition, responsible for hasty and inaccurate judgments (and based on stereotypes and habitual associations), is increasingly opposed to logical intuition (e.g. Thomson *et al.*, 2018). It is believed that the correct use of logic rules can also be automated and lead to immediate, correct decisions. In other words, logical operations can also take place in an automated manner (and therefore, in a sense, intuitive), without requiring time-consuming, deliberative thinking (De Neys, Pennycook, 2019; Raelison, De Neys, 2020). These conclusions, supported by the results of experimental research, enhance intuitive processing information, at the same time questioning the belief that logic is the domain of rational consciousness.

THE HOLISTIC NATURE OF INTUITION

Therefore, we should distance ourselves from the narrowing of intuition that is common in the context of experimental psychology and linking it with quick, superficial information processing and spontaneous reaction. The speed of reaction is the result of secondary automation of processes or the use of biological software, in the sense of unconditioned and (somewhat) conditioned reflexes. This does not mean, however, that our unconscious cognitive resources (in the sense

of personal experiences and all memory traces) must be used only immediately or not at all. In particular, the history of scientific discoveries provides convincing examples that the so-called the incubation phase, preceding the emergence of a key idea, can last for years. It should be assumed that at this time the unconscious intelligence is actively confronting the previously “assigned” but unfinished task.

So let’s go back to the very beginning, i.e. to the quite obvious assumption that intuition is the “intelligence of the unconscious.” If we are faced with a complex, difficult problem, as is the case in the context of scientific discoveries, expecting an immediate, quick prompt from the unconscious would be strange and unreasonable. Let’s assume, for example, that we have half a year to make a difficult and important decision about the future, involving a large margin of uncertainty. Why would our unconscious mind then act hastily and give up on further information processing? I am coming to the conclusion that the unconscious, i.e. intuition, does not have to act quickly or immediately – unless a real situation (e.g. life threat) requires it.

Typically, conscious and unconscious information processing processes come together when making major decisions. The proportions of unconscious and reflective-deliberative processes responsible for making decisions vary, and their impact on the accuracy of decisions is difficult to determine. This has been the subject of sophisticated research for some time (Isler, Yilmaz, Dogruyol, 2020; Wang *et al.*, 2023). In experimental conditions, attempts are made to influence this proportion in various ways, i.e. by manipulating time pressure, recalling memories related to either emotions or reflection, and through the so-called cognitive load (simultaneous performance of another task). Particularly effective techniques for influencing the course of these processes turned out to be: 1) activating reflection processes through training in neutralizing erroneous cognitive tendencies (debiasing practice), 2) the requirement to justify one’s own decisions, and 3) the use of financial incentives, i.e. paying small amounts for each correct answer (Isler, Yilmaz, 2023).

For a long time, there was a dominant belief in the “superiority” of rational consciousness processes, which were assigned a corrective function towards initial intuitions. In other words, it was assumed that intuitive processes are more biased and susceptible to stereotypes, and the role of conscious cognitive operations is to correct them. It turns out that this does not have to be the case (Wilson, Schooler, 1991; Thorsteinson, Withrow, 2009; De Neys, Pennycook, 2019). More recent research (Raoelison, De Neys, 2020) shows that more intelligent people, i.e. those who coped better with tasks, were more likely to make the right decisions already in the first, intuitive phase of confronting the problem. It has also been known for a long time that in the case of experienced experts (practitioners), correct decisions appear almost immediately, while in the case of less experienced adepts, this is preceded by long reflection and testing of subsequent ideas.

A PLACE OF INTUITION

Finally, one can formulate a quite safe thesis (although difficult to verify empirically) that chronic use of the Internet and, in general, applications provided by digital technology, is not conducive to intuition. Intuition requires attentiveness and sensitivity (instead of aggressive loudness) that accompany direct contacts with living beings. The whispers of intuition, when confronted with new situations and problems, require silence and do not tolerate time pressure if they are to be heard. It is true that in the digitalized world, in everyday, standard situations, we have to appeal to intuition less often, because algorithmic applications take over from us time and time again. However, on the other hand, because we rarely use it, there is doubt as to whether we can still use it when it is justified or even necessary.

The popularity of the concept of emotional intelligence has gained in the last quarter of a century suggests that we apparently have a problem with access to our own (and other people's) subjectivity. Despite the development of artificial intelligence, the margin of uncertainty that an individual faces when making life decisions is not decreasing. We live in “liquid modernity” (Bauman, 2006), which is changing

faster than ever. And as Gigerenzer reminds us: “Complex algorithms work best in well-defined, stable situations where a large amount of data is available” (Gigerenzer, 2022, p. 39). To emphasize this fundamental regularity, the author even proposes the term “The stable world principle.” Therefore, the best antidote to uncertainty seems to be good intuition, understood as an ability (for more details, see Karwowski, 2005).

An intriguing matter are the manifestations of intuition with a capital “I,” which are difficult to explain and identify. This would require referring to unconventional visions of reality, starting with the concept of the collective unconsciousness and the principle of synchronicity by Carl G. Young, through the idea of a holographic universe (Talbot, 1991), and ending with some interpretations of quantum physics, with particular emphasis on the concept of “non-locality.” However, this topic requires separate and longer treatment.

DIGITAL INTUITION?

There is one more, quite unexpected argument proving the value of intuition, identified with unconscious cognition. Well, a few years ago, a short editorial text was published in *Nature* (Editorial, 2016) with the provocative title *Digital Intuition*. The authors compare two achievements of artificial intelligence, i.e. defeating Garry Kasparov in 1997 by Deep Blue in chess and defeating Go champions by the AlphaGo program in 2015. They emphasize the qualitative change in the principles of operation of both machines and the resulting new possibilities. They write:

the new technology is based on a set of deep neural networks. They have been trained to mimic the movements of the best human players, reward victories and, using a probability distribution, limit the outcomes (...) to a single verdict: win or lose. [This allows] to significantly reduce the number of possible moves that the program evaluates and selects – in an intuitive way (Editorial, 2016, p. 437).

It turns out that the term „digital intuition” is not an oxymoron. It is justified. The analogy

between unconscious human processes, identified with intuition, and the direction of evolution of artificial intelligence is quite justified. In both cases, it happens that – as it turns out after the fact – the reaction was extremely accurate, but it is not known how it happened or to what processes (strategies) we owe it. In both cases, we are dealing with a lack of awareness of the processes to which we owe this, often spectacular, result. In the case of humans, in relation to incidental events, we can look for an ordinary or lucky coincidence. Only in the face of repeatable facts are we willing to abandon such an interpretation. To sum up, the direction of development of artificial intelligence also allows us to appreciate the accuracy and cognitive values of human intuition.

The expansion of artificial intelligence raises both hopes and fears. Various applications reduce our cognitive activity and limit the validity of taking into account subjective feelings and assessments. Thus, they also reduce opportunities to exercise and test our own intuition. Perhaps we won't need it for anything soon? In my mind's eye I see, for example, a doctor who, during his morning rounds, points an electronic gadget towards the patient and, instead of the usual question "How are you feeling today," announces – "You feel quite good today, because GUBI (General Well-Being Index) displayed an 8 on a 10-point scale." Perhaps soon, before our morning coffee, we will turn on the appropriate application to find out how we feel today. However, if our battery runs out, we will feel helpless.

There is also the other side of the coin. Toby Walsh (2018), one of the co-creators of the ongoing technological revolution, in his book makes 10 predictions with a deadline for implementation by 2050. One of them states that "we will receive daily medical advice," even if we are not hypochondriacs. The author does not mean to say that the health of the inhabitants of our planet will deteriorate radically, requiring constant medical assistance. He only suggests that this doctor will be our computer, which will not only monitor most of the physiological parameters on an ongoing basis, but also analyze, advise and warn, and, if necessary, refer us to appropriate specialists.

Returning to the question in the title, it seems that in the algorithmized world there is little room for intuition, and there will be even less.

BIBLIOGRAPHY

- Agor W.H. (ed.) (1998). *Intuicja w organizacji. Jak twórczo przewodzić i zarządzać*, transl. K. Mudyń. Kraków: Wydawnictwo PSB.
- Bauman S. (2006). *Płynna nowoczesność*. Kraków: Wydawnictwo Literackie.
- Belk R. (1988). Possession and the extended self. *Journal of Consumer Research*, 15, 139–168, <https://doi.org/10.1086/209154>.
- Borges J.L. (1996). *Biblioteka Babel*, <https://docer.pl/doc/80vsn50>.
- Cheever N.A., Larry D., Rosen L.D., Carrier M., Chavez A. (2014). "Out of sight is not out of mind": The impact of restricting wireless mobile device use on anxiety levels among low, moderate and high users. *Computers in Human Behavior*, 37, 290–297.
- Clayton R.B., Leshner G., Almond A. (2015). The extended self: The impact of iPhone separation on cognition, emotion, and physiology. *Journal of Computer-Mediated Communication*, 20(2), 119–135.
- Caird J.K., Chelsea R.W., Piers S., Chip S. (2008). A meta-analysis of the effects of cell phones on driver performance. *Accident Analysis and Prevention*, 40(4), 1282–1293.
- De Neys W., Pennycook G. (2019). Logic, fast and slow: Advances in dual-process theorizing. *Current Directions in Psychological Science*, 1–7, <https://doi.org/10.1177/0963721419855658>.
- Dobrowolowicz W. (2019). *Intuicja – w stronę teorii*. Lublin: Wydawnictwo UMCS
- Editorial (2016). Digital intuition. *Nature*, 529, 437, <https://doi.org/10.1038/529437a>.
- Gigerenzer G. (2008). *Gut Feelings. The Intelligence of the Unconscious*. London: Penguin Books.
- Gigerenzer G. (2022). *How to Stay Smart in a Smart World. Why Human Intelligence Still Beats Algorithms*. London: Allen Lane.
- Goldberg Ph. (1998). Doświadczenie intuicji. In: W.H. Agor (ed.), *Intuicja w organizacji. Jak twórczo przewodzić i zarządzać*. Kraków: Wydawnictwo PSB, 217–243.

- Isler O., Yilmaz O., Dogruyol B. (2020). Activating reflective thinking with decision justification and debiasing training. *Judgment and Decision Making*, 15(6), 926–938, <https://doi.org/10.1017/S1930297500008147>.
- Isler O., Yilmaz O. (2023). How to activate intuitive and reflective thinking in behavior research? A comprehensive examination of experimental techniques. *Behavior Research Methods*, 55, 3679–3698, <https://doi.org/10.3758/s13428-022-01984-4>.
- Kahneman D. (2012). *Pułapki myślenia. O myśleniu szybkim i wolnym*. Poznań: Wydawnictwo Media Rodzina.
- Karwowski M. (2005). Intuicja jako zdolność, wymiar osobowości i styl funkcjonowania. Syntetyzujący przegląd niektórych stanowisk psychologicznych. *Studia Psychologica Uniwersytetu Kardynała Stefana Wyszyńskiego*, 6, 189–206.
- Kumaraswamy S., Binoe A.P. (2022). Awareness of virtual autism among parents'. *International Journal of Current Advanced Research*, 11(07), 1283–1286, <http://journalijcar.org/sites/default/files/issue-files/13450-A-2022.pdf>.
- Myers D.G. (2004). *Intuicja. Jej siła i słabość*, transl. A. Sosenko. Wrocław: Moderator.
- Mudyń K. (1998). Czy Internet zastąpi intuicję? In: W.H. Agor (ed.), *Intuicja w organizacji. Jak tworzyć i zarządzać*. Kraków: Wydawnictwo PSB, 343–348.
- Mudyń K. (2010). Digitalizacja rzeczywistości a problem dekontekstualizacji istnienia. In: T. Rowiński, R. Tadeusiewicz (ed.), *Psychologia i informatyka. Ich synergia i kontradycje w społeczeństwie informacyjnym*. Warszawa: Wydawnictwo Uniwersytetu Kardynała Stefana Wyszyńskiego, 191–204.
- Nałczadźjan A. (1979). *Intuicja a odkrycie naukowe*. Warszawa: Państwowy Instytut Wydawniczy.
- Raoelison M., Thompson V.A., De Neys W. (2020). The smart intuitor: Cognitive capacity predicts intuitive rather than deliberate thinking. *Cognition*, 204, 104381, <https://doi.org/10.1016/j.cognition.2020.104381>.
- Soros G. (1996). *Alchemia finansów, czyli jak zrozumieć rynek*. Kraków: Znak.
- Spitzer M. (2013). *Cyfrowa demencja. W jaki sposób pozbawiamy rozumu siebie i swoje dzieci*. Słupsk: Wydawnictwo Dobra Literatura.
- Talbot M. (1991). *The Holographic Universe*. New York: HarperCollins Publishers.
- Thorsteinson T.J., Withrow S. (2009). Does unconscious thought outperform conscious thought on complex decisions? A further examination. *Judgment and Decision Making*, 4(3), 235–247, <https://doi.org/10.1017/S1930297500001765>.
- Walsh T. (2018). *To żyje! Sztuczna inteligencja. Od logicznego fortepianu po zabójcze roboty*. Warszawa: Wydawnictwo Naukowe PWN.
- Wang Y., Bao W., Stuppel E., Luo J. (2023). Robust intuition? Exploring the difference in the strength of intuitions from perspective of attentional bias, *Thinking & Reasoning*, 30(1), 169–194, <https://doi.org/10.1080/13546783.2023.2220972>.
- Ward A.F., Duke K., Gneezy A. Bos M.W. (2017). Drain: The mere presence of one's own smartphone reduces available cognitive capacity. *The Consumer in a Connected World*, 2(2), 140–154, <https://www.journals.uchicago.edu/doi/10.1086/691462>.
- Wilson T.D., Schooler J.W. (1991). Thinking too much: Introspection can reduce the quality of preferences and decisions. *Journal of Personality and Social Psychology*, 60(2), 181–192, <https://doi.org/10.1037/0022-3514.60.2.181>.

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