CRITICAL THINKING AND THE CHALLENGES OF INTERNET

Alexander PLENCNER

PhDr. Alexander Plencner, PhD.
Faculty of Mass Media Communication
University of SS. Cyril and Methodius in Trnava
Námestie J. Herdu 2
917 01 Trnava
Slovak Republic
alexander.plencner@gmail.com

Alexander Plencner is interested in popular culture, theory of media, history of film, sociology of way of life and psychology. He finished media studies at Faculty of Mass Media Communication at University of SS. Cyril and Methodius in Trnava where he works as an assistant professor until today. He is a member of Department of mass media communication and teaches courses on theory of media, cult films and mass culture. He accomplished postgraduate education in the programme of cultural studies at Philosophical Faculty of Comenius University in Bratislava with the PhD thesis "Reflections about Popular Culture at the End of the Century". He was contributor of several projects of media education in Slovakia. From 2006 until 2011 he was Slovak editor in international magazine Mediální studia / Media Studies. He was co-founder of IMEC – Media Literacy Center. In 2013 he became an editor of European Journal of Media, Art and Photography. From 2011 he also works as soft skills trainer at business company FBE Bratislava and he is external lecturer and editor for non-governmental organization People in Peril Association Slovakia.

ABSTRACT:

In this article, the author addresses some challenges to information searches and information evaluation which were brought by the Internet. Large segments of audience are exaggerating their awareness and do not realize that their online behavior is driven more by emotions than by critical assessment of primary sources. The result is growing popularity of conspiracy theories, pseudoscience, propaganda, and alternative medicine. These are all examples of biased reasoning. Due to scientists, scholars, teachers, and journalists, this trend can be considered as a potential threat to public health and democracy. Publics incapable of informed choices can be manipulated to support radical political utopia or to reject evidence based treatments. Some basic principles of media literacy, scientific literacy and critical thinking are outlined. They can be used as tools for raising awareness, enhancing reasoning and adopting more objective perspective. This article is based on assumption that behind irrational beliefs there often lies anxiety, precondition for distrust derived from childhood. Not only general users of the Internet tend to overestimate their competence in domains of their interest (so called Dunning-Kruger effect), their behavior may be affected by unrecognized emotional agenda (cautious monitoring of environment for danger, suspicious attitude towards authority figures and official sources of information). The article is enclosed with some recommendation how to evaluate information sources on the Internet and how to be more empathetic in online discussions in order to inspire to reasonable and healthy choices.

KEYWORDS:

critical thinking, the Internet, information, education, media literacy, scientific literacy, conspiracy theories, pseudoscience, propaganda, alternative medicine

Introduction

Since the emergence of the Internet in the nineties, there were generally high expectations felt about its role in uniting the world into a new interactive, discussing and sharing community of people. However, critical voices have risen too. Journalists, teachers and scientists sometimes expressed their concerns about vulnerability of new online audiences to manipulation, security threats, and other dangers like behavioral addiction. Not only large segments of audiences spent hours before TV and computer screens daily[1] – especially

1   PLENCNER, A.: Aktuálne témy v kritike masovej a populárnej kultúry. In MORAVČÍKOVÁ, E. (ed.): *Kultúra v premenách globalizácie.* Nitra : Univerzita Konštantína Filozofa v Nitre, 2012, p. 298-299.

among population with depressive, anxiety symptoms, low social integration or poor social skills. There was another problem – self-deception. Virtual worlds of cyberspace offered an illusion of control and reduction of harm. Internet users could gain false sense of reliability of online information due to its confirmation by social relevance, its significance to other people. Facts were no more facts but rather factoids – notions and suggestions validated according to emotional logic of the user and to his wishful thinking. Evidence was no more necessary. This of course involved groups and institutions as well. The old mass media were at least legally responsible for published information. But where was the guaranty of truth related to anonymous online users or obscure information sources? On the web, everyone could publish anything. Thus entertainment, information, experiences and testimonies available in few seconds online were perceived as a great advantage and possible danger at the same time. Scholars always tended to view modern media either enthusiastically (John Fiske) or suspiciously (Jean Baudrillard). The debate goes on and in the case of digital media (also known as new media) is even more accentuated.

General users of the Internet are not aware of specific obstacles to opinion and decision making posed by easy availability of all kinds of unsorted information. Usually, one needs to know something about common biases in thinking and reliability of various information sources. Knowing one's own incompetence is a starting point for acquiring self-awareness and freedom of thinking. For a general Internet user, it is rather critical thinking skills and competence in information evaluation, than formal education in some field of study, what is needed as a basis for informed opinion and decision making.

In this article I will address media literacy, scientific literacy and critical thinking. I suggest that uncritical persons are not capable to address and recognize their own incompetence. This can be attributed to Dunning-Kruger effect. The differences between critical and uncritical thinking are pointed out. Misconceptions about critical thinking are outlined as well. The next part of the article is dedicated to key themes in critical thinking: conspiracy theories, pseudoscience, propaganda, and alternative medicine. These are examples of biased reasoning. Their possible causes and typical outcomes are mentioned. I am making an assumption that behind most biased reasoning and flawed theories there lies an anxiety, precondition for distrust probably derived from childhood. Last section of the article summarizes notable critical thinking initiatives in Slovakia. The article is enclosed with two recommendations: how to identify credible sources of information, and how to be more successful in persuasive communication efforts. The first one is intended for a general user of the Internet, the second one for critically thinking persons engaged in discussions. In this article I express my belief that critical thinking can be considered as a basic skill for conscious use of media and cautious judgment of published scientific claims.

The Internet, media literacy and scientific literacy

The Internet and digital media are in some way continuation of old mass media (like television broadcasting available via new information channels, devices, and platforms), in other way they are something special – integration of all kind of media into new environment. According to Slavomír Gálik and Radoslava Cenká, "the fundamental feature of the most modern and most powerful electronic media (the Internet, television) is images, which change the way of thinking, imagination and recognition".[2] As long as written and printed word ceased to be the primary information carrier of western culture and mass society submerged to technical images (photography, cinematography, television, computer graphic interface), the dominance of logic, slow processes of critical thinking, and careful evaluation of arguments was no more taken for granted. With faster and faster communication, more immediate responses were desirable. Along with them, the media started to increasingly address intuition, precognition, and prejudices of their audiences. Images, text, moving images, and graphics merged into new coherent structures with very complex meanings and yet immediate feelings of familiarity. They begin to form everyday narratives appealing to audiences' emotions and expectations.

However, challenge of thoughts and examination of reality requires to slow down and tolerate uncomfortable feelings of uncertainty. Is this still possible, when major role of the Internet for many is reassurance and distraction? For some people, it is a window to reality, for others, it is rather a shelter from it. With a little dose of skepticism one can come to conclusion that what the general user often gains from the Internet, is information, not knowledge, connection, not community, knowing and not understanding. In the age of widespread intuitive attitudes towards virtual reality, critical thinking is even more important. Dana Petranová expresses her opinion that "the lowest common denominator in nearly all definitions of media literacy is the idea of development of critical thinking skills. This acquired competence should assist public in its efforts for understanding media messages, for conscious choice of appropriate media channels and media products, and for self-aware consumption of media focused on enhancing sensitivity, reasoning and overall support".[3]

But what exactly is media literacy? Let us turn to W. James Potter and his definition. Literacy in the broadest sense of the word is cognitive ability to speak, read and understand. "Media literacy," Potter explains, "is a set of perspectives that we actively use to expose ourselves to the media to interpret the meaning of the messages we encounter. We build our perspectives from knowledge structures. To build our knowledge structures, we need tools and raw material. These tools are our skills. The raw material is information from the media and from the real world. Active use means that we are aware of the messages and are consciously interacting with them".[4] But why is such skill needed anyway? Is it not obvious that media users do understand what they are reading, listening or watching? There are two problems in this assumption. First, there are cognitive biases. We, as the audience, can come to false conclusions that we know and understand something which we actually do not. It could be either because we are not aware that we have identified ourselves with pre-existing thoughts or concepts (hence our opinions are adopted and not deliberately formed) or we are overestimating our competence. Second, as long as we do not know how the media operate, how media messages are produced, how meanings are suggested, we are vulnerable to intentions of media institutions. Viera Kačinová, Viktória Kolčáková and Dana Petranová make clear that to critically assess media means to "be able to detect the potential manipulative effects of media, to distinguish values and qualities, to be well informed about value systems or models mediated by the media as well as to make autonomous, deliberate decisions when selecting media products".[5]

Due to Potter, our position is weak at the beginning, because of several factors: information fatigue, false feeling of being informed, false sense of control, and faulty beliefs.[6] We are overwhelmed by the amount of information and entertainment, so we are prone to switch to automatic mode of perception. Because there are so many information sources and channels, the media have to compete for our attention. This builds heavy pressure for information simplification and leaving out the context at the expense of quality news and in-depth views. We also suppose that we can use media of our choice, when in reality we have predictable media habits and significant amount of our time of media consumption is dedicated to uninterrupted media exposure. We also tend to believe what we want to believe and rely on superficial information that resonates with our already held views. This type of selective thinking is known as confirmation bias. We favor some type of information not because it is true, but because it is emotionally significant to us. Our need for reassurance is so deep that it also works in other direction: we incline to filter or ignore information contradicting our beliefs. This predisposition is called cognitive dissonance.

Scientific literacy is a more specific skill than media literacy but it is related to the quality of acquired education and ability to thinking critically. Scientific literacy in the narrow sense means competence to understand science, especially its theories, methodology, observation, experiments and tests. In the broad sense, scientific literacy "means that a person can ask, find, or determine answers to questions derived from curiosity about everyday experiences. It means that a person has the ability to describe, explain, and predict natural phenomena.

2   GÁLIK, S., CENKÁ, R.: *Twilight of Christianity in tele-view of the world. From homo religiosus to homo videns.* In European Journal of Science and Theology, 2013, Vol. 9, No. 5, p. 225-226.

3   PETRANOVÁ, D.: *Rozvíja mediálna výchova v školách kritické kompetencie žiakov?* In Communication Today, 2011, Vol. 2, No. 1, p. 67.
4   POTTER, W. J.: *Media Literacy.* Third Edition. Thousand Oaks, London, New Delhi : Sage Publications, 2005, p. 22.
5   KAČINOVÁ, V., KOLČÁKOVÁ, V., PETRANOVÁ, D.: *Axiocentric media education as a strategy for the cultivation of media recipients.* In European Journal of Science and Theology, 2014, Vol. 10, No. 1, p. 104.
6   POTTER, W. J.: *Media Literacy.* Third Edition. Sage Publications. Thousand Oaks, London, New Delhi : 2005, p. 7-13.

Scientific literacy entails being able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions. Scientific literacy implies that a person can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed. A literate citizen should be able to evaluate the quality of scientific information on the basis of its source and the methods used to generate it. Scientific literacy also implies the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately".[7] This explanation is taken from National Science Education Standards.

Critical thinking

Critical thinking has been important since the very beginning of looking for answers. Willingness to ask the right questions and skills in identifying good sources is a necessary prerequisite to finding valuable results. However, some critical awareness is crucial whenever a person uses the Internet. General users of the Internet can easily acquire false sense of being thoughtful. They can unconsciously mislead themselves that effort spent on searching information is equal to effort spent on thinking. Using the web search engine, reading online articles, gathering information or discussing in forums cannot be considered as a critical practice. Interactivity is not by itself a process of reasoning, it is only engagement, investment of our attention. No significant conscious choices were made. Behavior of the Internet user is mainly facilitated by online search algorithms, technological protocols that adjust possible activity into predictable set of options. Users need to understand what to search, how to search and how to evaluate what they have found. For example, on child-related websites, the keyword "vaccination" led to only 40% provaccination sites and 60% antivaccination sites. By contrast, "immunization" directed user to 98% provaccination sites and only 2% antivaccination sites. Due to Robert M. Wolfe and Lisa K. Sharp, "any use of the term "vaccination" during an Internet search is likely to expose a parent to a significant amount of antivaccination information".[8]

Search patterns of a general user of the Internet can be driven by non-reflected emotional needs (such as anxiety, need for security) and not by natural curiosity. Critically thinking persons are aware of their own biases and are able to set their emotional needs aside, to look at the facts without prejudice, and with generally neutral attitude. They are able to distinguish "facts" (context free information) and "opinions" (context-based information saturated with/or derived from emotions and values). Critically illiterate persons are not aware of fallacies in their reasoning. They can easily give in to false arguments, like appeal to authority (Something is true because experts say so: "Researchers from Cochrane Collaboration also question long-term safety of vaccination. I would never get my child vaccinated"), appeal to popular belief (Something is true because majority of people believe in it: "India is much more spiritual than the West"), appeal to ignorance (A claim is true because it has not been proven false: "Nobody has proved to me that there is extra-terrestrial life. We are alone in the Universe."), appeal to fear (An argument is based on provoking fear and prejudice towards the opponents: "Do you want homosexuals to raise our children? They are sick and perverted!"), appeal to wishful thinking (A claim is perceived true because person strongly hopes in it: "Our prime minister is a good Slovak and caring leader, he would not be lying about that") or others.

With some simplification we can say that the difference between a critically aware person and uncritical one lies in the readiness to challenge their own position. "Uncritical" thinker is critical to others in order to protect his or her own views, critical thinker is critical to views that are not supported with good arguments, despite who is holding them – laymen, scientists, authorities or institutions. Critically thinking persons are willing to change their opinions according to the facts, uncritical persons refuse to change their opinions despite the facts.

But why is it so difficult to rethink our models of reality, to carefully examine our position, to challenge our thoughts? Is it not a common part of learning? An obstacle we face here is so called "Dunning-Kruger effect". David Dunning and Justin Kruger designed an experiment that demonstrated ways in which people overestimate their performance and ability.[9] Subjects of study were tested in humor, logical reasoning and grammar. According to Dunning and Kruger, people unskilled in certain domains suffer a dual burden: 1) they reach erroneous conclusions and make unfortunate choices; 2) their incompetence robs them of the metacognitive ability to realize it. In other words, because they are incompetent, they are not capable to identify their own incompetence. The authors found out that the most incompetent individuals, compared with their more competent peers, had most dramatically overestimated their ability and performance relative to objective criteria. And what is really interesting, when they were confronted with results, they did not change their self-assessment. By contrast, the most competent individuals were most likely to underestimate their ability and performance. Because they were more experienced in tested domains, they were well aware of what they yet did not know. But as soon as the researchers presented them their positive results, they adjusted their self-assessment to more objective levels.

According to the authors, the incompetent have a tendency to overestimate their capabilities, they are incompetent to evaluate the competence level of others, and they are not willing to admit it. However, the incompetent can gain insight about their shortcomings. But paradoxically this is only possible by making them more competent. They need to acquire metacognitive skills necessary to be able to realize that they have performed poorly. As soon as competence is increased in certain domain, the former incompetence is recognized. This is a noteworthy finding for learning and education. The public needs to know that it is important to raise their competence in domains of their interest and to honestly face their own lack of knowledge or objectivity. We have to acknowledge that our attitudes or opinions towards issues we have a very little information of, are probably not relevant and most likely to be biased. Feelings of confidence in searching and evaluation of highly specific information, when we have little or no substantial knowledge, is a warning sign for Dunning-Kruger effect.

It is critical thinking that can be considered as a way how to gain more objectivity and competence in our efforts for understanding. What exactly does it mean to think critically? I will refer here to Robert Todd Carroll's book Becoming A Critical Thinker[10] and Greg R. Haskins' online essay Practical Guide to Critical Thinking.[11] Let us start with what critical thinking is not. Thinking critically does not mean thinking negatively, being full of prejudices towards others who hold different opinions. It does not mean searching for mistakes or flaws. It is ability to evaluate arguments regardless of who conveyed them. Critical thinking is not an inborn gift, rather it is a skill that can be learned and improved. It is only indirectly related to knowledge or wisdom. A person who has acquired education in some field of study is not automatically equipped with critical thinking skills. These skills can be learned at school but they can be learned outside whichever educational system as well. However, quality education should involve critical thinking. It is possible for two people to be equally intelligent and yet one of them could be better at analyzing facts, claims, making conclusions and decisions. Even the wisest scholar, scientist or the most experienced expert can be wrong in many of his or her assumptions. Science is an activity of obtaining understanding about the natural or social world and its indispensable part is persistent effort to correct and review what is already known. We can say that if science is aimed at better and fuller knowledge, critical thinking is activity aimed at better reasoning.

Another misconception about critical thinking is that it excludes emotions. Thinking cannot be reduced to pure rationality. We use our emotions and intuition to help us critically decide what to do in certain situations, mainly because we are social beings. A critical thinker rather addresses reason, emotions and intuition as tools and knows when to use which of them. He or she is able to prioritize them according to particular context. Being critically aware does not imply being impersonal, cold or detached, it simply means to be more

7   National Science Education Standards. Washington, DC : The National Academy Press, 1996, p. 22.
8   WOLFE, R. M., SHARP, L.K.: Vaccination or Immunization? The Impact of Search Terms on the Internet. In Journal of Health Communication: International Perspectives, 2005, Vol. 10, No. 6, p. 537-551.

9   KRUGER, J., DUNNING, D.: Unskilled and Unaware of It: How Difficulties of Recognizing One's Own Incompetence Lead to Inflated Self-assessments. In Journal of Personality and Social Psychology, 1999, Vol. 77, No. 6, p. 1121-1134.
10   CARROLL, R. T.: Becoming a Critical Thinker: A Guide for the New Millennium. Second Edition. Boston : Pearson Custom Publishing, 2004.
11   HASKINS, G. R.: A Practical Guide to Critical Thinking. [online]. [2014-07-08]. Available at: <http://skepdic.com/essays/Haskins.html>.

objective. It also does not mean adopting some set of beliefs. A person needs not to believe in critical thinking. Critical thinking is not a system of thought competing with religion. Some critical thinkers are atheists, some are agnostics, and some are theists.

Forming opinions and decision making always implies considering values and norms. Critically thinking persons do not deny that. However, they are aware of this process; they know there is no such thing as perception of pure reality without the presence of an observer. There are almost always some personal factors interfering our perception and judgment (for example sociologists interested in social justice or natural scientist committed to particular environmental agenda). It is rather typical for uncritical persons to be sure that they are objective, that they definitely "have" the truth like it could be some sort of property. The world should be like they believe and everyone who does not see it in the same way must be wrong. We all have uncritical parts of our minds, especially when it comes to consideration of issues with strong emotional content. A critical thinker should be able to detect when he or she is starting to loose neutrality. A person who wants to be a critical thinker has to adopt sort of intellectual humility, has to be acquainted with his or her limits and respect views of others. Critical thinkers tend to view the truth as a kind of perspective. Because different perspectives have different validity, they try to find out which one of them best matches or describes the reality. Sometimes the theory or concept is compound from several perspectives. These perspectives can or cannot be integrated into one functional model (for example, there is a Grand Unified Theory which attempts to integrate gravity with electromagnetic, weak and strong interactions in physics, or there are various complementary and contradicting theories of media violence in psychology and media studies).

An uncritical person usually expresses his or her opinion towards some issue or topic and then selectively searches for facts that support it (for example abortion laws, artificial insemination, gun control, GMO). A critical thinker clarifies his or her values, looks up all relevant facts (and tries his or her best not to dismiss uncomfortable ones) and then forms final opinion. Critical thinkers do not know which attitude they finally adopt. Freedom of thinking and quality of reasoning is valued more than loyalty to ideas important to some social groups. Rather than arguing with "right" or "wrong", a critically aware person operates with terms like "valid" or "invalid", examining if a certain claim is true, partially true or false.

Critical thinking is aimed at reaching well-founded viewpoints. So what exactly is critical thinking? Robert Todd Carroll clarifies that when we are thinking critically, we are using our knowledge and intelligence effectively to arrive at the most reasonable and justifiable position possible. Due to him, to think critically is to "think clearly, accurately, knowledgeably, and fairly while evaluating the reasons for a belief or for taking some action".[12] Carroll explains that most important part of critical thinking is logic, epistemology, and ethics. Logic studies reasoning, epistemology studies the nature of knowledge and ethics studies morality of actions. Haskins expresses his conviction that critically thinking persons usually come to more relevant conclusions; they are better decision makers and more effective problem solvers. Becoming a critical thinker involves balancing between open-mindedness and healthy skepticism. Skepticism here is rather a method than an attitude. A critical thinker should be able to recognize and avoid critical thinking hindrances, to identify, characterize and evaluate arguments and to evaluate information sources.[13]

Conspiracy theories, pseudoscience, propaganda and alternative medicine

Illiteracy or inability to evaluate information sources can seriously diminish capacity of public to protect themselves from deception. Weakly educated audiences are supported in keeping their distorted view of reality as long as they form major consumer groups that are attractive for conspiracy publishers, authoritarian political regimes or alternative medicine industry.

Milder forms of flawed thinking manifest themselves as beliefs in conspiracy theories and pseudoscience. Beliefs in conspiracy theories are wide-spread in the broad media audience. They form influential subcultures outside the mainstream and they are becoming more and more popular. It is not something new, conspiratorial outlook on history, politics or science has always been attractive for some parts of the audience (Umberto Eco devoted two of his novels to ironizing historical conspiracies – Foucault's Pendulum and The Prague Cemetery). The essence of every conspiracy theory is an alternative interpretation of some event. It is retelling of official version of a well-known story that turns its elements and motives upside down. Typical examples include 9/11 conspiracy (American government planned to destroy the World Trade Center, the towers could not came down because of planes' crash), The Moon Landing (USA never landed on the surface of Moon, whole event is fake and was filmed in studios), The Holocaust (due to conspirators, Holocaust never happened), Area 51/Roswell (a UFO crashed near Roswell, New Mexico and American government kept it secret) or New World Order (a group of international elites controls and manipulates governments, industry and the media). Popular conspiracy theory in Slovakia is related to the cultural and historical icon Milan Rastislav Štefánik. Many people believe that this general was assassinated on the order of Edvard Beneš – his plane was intentionally shot down.[14] However, some conspiracies were actually true, like Watergate involving American President Richard Nixon.

Audience that believes in conspiracy theory of one kind is usually susceptible to other theories as well. Beliefs in conspiracies are a form of paranoid thinking about the society. Damian Thompson refers to this attitude as "counterknowledge".[15] In view of Michael Barkun, bizarre conspiracy ideas might be attributed to the anxieties of "deeply shaken people, desperate to make sense of the shocking events". Behind disparate conspiracies there is the conviction that powerful, hidden, evil forces control human destinies. The locus of this evil lies outside the true community. The result is a worldview characterized by a sharp division between the realms of good and evil. Due to believers, nothing happens by accident, nothing is as it seems and everything is connected.[16] Thus, popularity of conspiracy theories may be viewed as an unsuccessful, irrational attempt to control anxiety and fear from unpredictable events and random evil.

Beliefs in conspiracy theories are closely associated with beliefs in pseudoscience. Pseudoscience offers an illusion of understanding without effort and without doubt. But its functions are probably deeper, pseudoscience may very well serve as a source of explanation (Creationism and Intelligent Design), control (Astrology) and mystery (Eastern theories of energy systems of human body). But one can find that also in science (The Gene Theory, The Law of Demand, The Anthropic Cosmological Principle). Then what is the difference between science and pseudoscience? Stephen S. Carey explains that scientific method is a simple, three-step process, consisting of observing, explaining, and testing. Science investigates natural phenomena, from the physical to the biological to the social. In order to understand what is unclear, possible explanations for observational findings need to be proposed. Then they have to be tested if they are correct. Scientists design experiments to determine whether the results actually match their predictions. If it happens, scientists have a good reason to believe their explanation is right. Scientific findings are open to revision and changes in scientific understanding are very common. They generally occur at the level of underlying explanation. By contrast, pseudoscience refuses to be tested. It does not adhere to the methods of science (accurate observation, explanatory methods, designing experiments and testing claims). Pseudoscience is not self-correcting, it rarely changes much over time. While science produces new explanatory or theoretical findings, pseudoscience produces very little theory. Pseudoscientific research comes with spectacular claims for extraordinary abilities and events. In view of Carey, "Genuine science embraces skepticism; pseudoscience tends to view skepticism as a sign of narrow-mindedness". Pseudoscience shows tendency to accept claims in the absence of solid scientific evidence in order to preserve sense of mystery.[17]

12   CARROLL, R. T.: *Becoming a Critical Thinker: A Guide for the New Millennium*. Second Edition. Boston : Pearson Custom Publishing, 2004.
13   HASKINS, G. R.: *A Practical Guide to Critical Thinking*. [online]. [2014-07-08]. Available at: <http://skepdic.com/essays/Haskins.html>.

14   ČUPKA, M.: *Prečo ľudia potrebujú konšpiračné bludy*. [online]. [2014-01-26]. Available at: <http://zurnal.pravda.sk/spolocnost/clanok/306261-preco-ludia-potrebuju-konspiracne-bludy/>.
15   THOMPSON, D.: *Counterknowledge: How we surrender to conspiracy theories, quack medicine, bogus science, and fake history*. New York, London : W. W. Norton & Company, 2008.
16   BARKUN, M. A.: *Culture of Conspiracy: Apocalyptic Visions in Contemporary America*. Berkeley, Los Angeles, London : University of California Press, 2003, p. 2-4.
17   CAREY, S. S.: *A Beginner's Guide to Scientific Method*. Fourth edition. Wadsworth Cencage Learning, 2010, p. 123-128.

Public need for mystery and reassurance may be exploited not only by pseudoscientists but also by specialized marketers selling their esoteric, new age, metaphysical or occult merchandise or services (like crystal energy stones, Geo-Pathogenic Zones protection shields, bio-energetic jewelry etc.). These products are nothing more than embodiment of pseudoscientific theories.

Lack of critical awareness can be a more serious problem than harmless beliefs in conspiracy theories and pseudoscience – especially for democracy and general public health. The public cannot always be taken responsible for this.

The next issue I would like to mention is propaganda. Why do people believe in political utopia? The problem may lie in the fact that many politicians do not wish to serve public in the first place. They often try to maintain their position and influence. Therefore they support the kind of agenda that is important for their electorate. Risk of success of propaganda is higher when political representatives play a double role: they formally express the need for justice and promote certain values appealing to public, but at the same time their very own actions contradict their proclaimed principles. Corruption, breaking the law, conviction that standard rules do not apply to them, spread distrust and contempt. Public is then much more vulnerable to manipulation via media propaganda. When dissatisfaction is strong enough and overtakes critical mass of public, the electorate often turns to radical political parties. When overall mood is being disappointment, the audience gives in to dangerous message: "no one is worth trusting". In this condition the risk of losing critical perspective and the rise propaganda is high. The audience is liable to believe in conspiracy theories and radical political solutions. This tendency encourages authoritarian politicians and their repressive systems.

Another threat is related to health. When health practitioners behave in an authoritarian way, when they do not arrange enough time for their patients, when they do not answer their questions and do not react to their concerns with empathy, they lose their trust. The patients would be looking elsewhere for the very first thing they needed mostly: hope and encouragement. When a person realizes he or she has a dangerous illness, loosing ability of critical judgment is very common. This situation is favorable for alternative medicine practitioners. Due to Paul Offit, alternative healers "provide natural remedies instead of artificial ones, comfort instead of distance, and individual attention instead of take-a-number-and-wait-your-turn inattention".[18] Offit states that alternative medicine is an aggressive industry with estimated amount of $34 billion annual profit. However, only about one-third of alternative therapies have ever been tested for their safety and efficacy.[19] If the patient is scared from invasive treatments like chemotherapy, s/he is vulnerable to false promises. When s/he decides to try alternative therapy, s/he often finds relief. Positive emotions and expectations arise. But meanwhile, the illness behind "positive thinking" steadily progresses. At the time when a patient is so sick that s/he finally seeks regular health care, it is often too late even for effective treatments from conventional, evidence based medicine to help. Scared, anxious people uncritically accepting the myth of natural remedies are easy targets for "The Hope Business", operating through the Internet and increasing their publics.

Anxiety as a precondition for distrust

From the overview of few key themes in critical thinking, we can assume that it is anxiety what lies behind some biased reasoning and flawed theories. Where does it come from? Developmental psychology recognizes various types of attachment between primary carers (mostly mothers) and infants. Security of individual's attachment in early age (until 2 or 3 years) influences his or her later self-worth, confidence, curiosity and overall sense of safety.

Anxiety and distrust experienced in adult age may be related to the type of attachment that a person has formed as a child. Major proponents of attachment theory are John Bowlby and Mary Ainsworth. Ainsworth designed an experiment (called "Strange Situation") to investigate various attachment types between children.

She measured and observed separation anxiety (how infant reacts when left by the caregiver), the infant's desire to explore surroundings, anxiety from stranger figure and behavior when caregiver returned.[20] Due to her findings, there are three possible attachment styles: secure attachment, insecure avoidant attachment and insecure ambivalent attachment.

Securely attached children were associated with sensitive and responsive primary care. They have developed a positive working model of themselves. They trust others and tend to view them as being available, responsive, and helpful. They feel safe to explore. Infants with avoidant attachment were associated with unresponsive primary care. The child experienced that communication of needs had no influence on mother or father. Avoidant persons think about themselves as unworthy and unacceptable. They are very independent. Ambivalently attached children experienced inconsistent primary care. Their needs were sometimes met and sometimes ignored. They have a negative self image and exaggerate their emotional responses in order to gain attention. These children failed to develop any feelings of security. They explored their surroundings less than other two types. Later, the fourth type of attachment was recognized, disorganized attachment style (confused and inconsistent attachment behavior).

Insecure attachment correlates with anxiety and in ambivalent types with reduced exploring. There is probably connection between natural curiosity, ability to tolerate distress from unpleasant findings and security of early attachment. Bowlby even suggested defensive and selective exclusion of information from awareness as a defense mechanism observable in early age. It protects the individual from experiencing unbearable mental pain, confusion, or conflict. He also considered a situation when two sources of information are highly contradictory. In this case the person can experience a severe psychic conflict.[21] Insecure attachment styles of certain individuals may affect their information searching patterns. They learned from very early age to cautiously and suspiciously monitor their environment for danger. Thus, reduced awareness and ability to search and critically evaluate information cannot be ascribed to deliberate ignorance. There may be reasons why certain people distrust authority figures such as scholars, scientists, journalists or respected bloggers.

Popularization of critical thinking in Slovakia

Digital illiteracy, biased thinking, invalid reasoning or poor evaluation of new information sources is wide-spread and hard to counterbalance. Lack of metacognitive ability to realize one's incompetence, anxiety from uncertainty and abundance of web sites that rather rely on affective than cognitive appeals, makes it even more difficult. Somewhat ironically, the best way how to challenge digital illiteracy is to spread knowledge about proper reasoning via Internet.

Notable contributions to popularization of critical thinking in Slovakia can be dated to 2010. Critical thinking, as a part of wider domain of media education, was promoted by International Media Education Center (IMEC) founded in 2010 at the Faculty of Mass Media Communication of University of SS. Cyril and Methodius in Trnava. More specific approaches were related to other initiatives. On 12th of December 2010 non-governmental organization Manageria set up an event "Forum for Inspirational Ideas" with the theme "Critical Thinking". Hundreds of guests, mostly students, had arrived. First part of happening was dedicated to presentation of various speakers, second part was designed for panel discussion between them and in the third part the audience could participate in discussing groups dedicated to various topics related to the main theme. On 28th of December of the same year, group of Internet debaters (Martin Bies, Peter Isteník and others) launched a web site Použime rozum (Use Your Reason). Their pages were intended as a reaction towards emerging popularity of conspiracy theories and pseudoscience. Their articles tried to popularize science and critical thinking, particularly evolutionary psychology and biology, information science, cognitive science and behavioral science. The authors intended to promote natural curiosity, proper reasoning and skepticism. Due to them, quality education leads to intellectual progress of the society. [22] The web site was active until 2013.

18   OFFIT, P. A.: *Do You Believe in Magic? The Sense and Nonsense of Alternative Medicine*. Harper, 2013, p. 8.
19   NUWER, R.: *Alternative Medicine Is a $34 Billion Industry, But Only One-Third of the Treatments Have Been Tested*. [online]. [2013-06-18]. Available at: <http://www.smithsonianmag.com/smart-news/alternative-medicine-is-a-34-billion-industry-but-only-one-third-of-the-treatments-have-been-tested-879411/>.

20   AINSWORTH, M. D., BELL, S. M.: *Attachment, Exploration, and Separation: Illustrated by the Behavior of One-Year-Olds in a Strange Situation*. In Child Development, 1970, Vol. 41, No. 1, p. 49-67.
21   BRETHERTON, I.: *The Origins of Attachment Theory: John Bowlby and Mary Ainsworth*. In Developmental Psychology, 1992, Vol. 28, No. 5, p. 759-775, 1992.
22   *Použime rozum*. [online]. [2014-07-08]. Available at: <http://www.pouzimerozum.sk/>.

In 2013 a new popular magazine Zem a vek (The Earth and Era) appeared in Slovakia. Its audience consisted of fans of conspiracy theories. Behind the magazine stood Tibor Eliot Rostas, an artist, film and television director, journalist and former copywriter. The magazine offered harsh critique of capitalism, denied official interpretation of many historical events and some of its texts leaned towards xenophobic and racist views. Many articles were composed from what had already been circulating the Internet. Rostas' infamous alternative news was also broadcasted through popular commercial Rádio Viva (Now Rádio Viva Metropol), spreading distrust and fear.

A need for intellectual opposition between students, scientists, journalists (weekly magazine .týždeň), bloggers and community activists, was felt. Daily newspapers Pravda and Sme published articles about conspiracy theories.[23] This somewhat underground theme was officially recognized by quality press. Other initiatives include Facebook groups Slovenskí skeptici (Slovakia Skeptics) and Slovenský klub skeptikov Darwin (Slovakian Skeptic Club Darwin). A respected activist in the critical thinking community in Slovakia is the blogger Matúš Ritomský.[24]

More specific reactions to pseudoscience and conspiracy theories are related to medicine. In 2013 two Facebook pages responded to dangerous anti-vaccination movement: community Neverím mýtom o škodlivosti očkovania (I don't believe myths about harmful effects of vaccination) and science website Lovci šarlatánov (Hunters of charlatans). The second one was created by group of students of medicine and pharmacy finishing their studies along with young physicians from Košice (Maroš Rudnay, Kamil Knorovský, Roland Oravský, and Marek Vícha). Later it was extended with regular off-Facebook website www.lovcisarlatanov.sk. The project is similar to Quackwatch, its Facebook version reached 7,173 likes until now.

Main intention of these activists was to stop health-related fallacies, absurd claims and apparent fraudulent products and services spreading around the Internet.[25] Due to Roland Oravský, there are three groups of believers in charlatan theories. The first group consists of radicals who would not change their minds under any circumstances. The second group includes the moderates who are interested in methods in medicine and they are overall curious. They do not see conspiracy of pharmaceutical corporations behind everything. The third group is made up of people capable of critical thinking, who just do not know where the truth is. And this is their target audience.

According to activists, it is the Internet, what helped charlatans to reach before unattainable publics.[26] Maroš Rudnay explains that just as there is no such thing like alternative physics, alternative mathematics, biology or physiology, there is no alternative system operating in medicine. Methods of treatments either work, can be tested and reasonably explained, or do not work and make no sense. Success of many alternative treatments can be ascribed to placebo effect.

However, the effectiveness of placebo is limited. There is a serious threat to health when a person relies on treatments that are irrational or confirmed as ineffective. Regarding health, the Internet is at the same time the best and the worst place for searching information. Maroš Rudnay concludes that teaching of critical thinking is absent in all levels of Slovak educational system. Due to him, a crucial part of education is ability to effectively search for information. Therefore, an Internet user needs to learn how to identify proper sources.[27]

Conclusions

Can we recommend any basic guidelines for a general user of the Internet in order to stay critically aware? How to distinguish between various information sources? A simple model can be helpful here, let us call it "Pyramid of Credibility". On the top of the pyramid there are the most reliable and credible sources: peer reviewed scientific magazines. Any scientific article (paper) needs to be carefully scrutinized in terms of its originality, significance and contribution to the field. The reviewers are other experts in the field. This does not mean that everything what is published is flawless, but it does mean that it had passed testing for appropriate scientific standards. A published article is open to criticism and later evaluation. For example, an important criterion for overall quality of the study is replicability of the published findings. In this way, false or controversial results are recognized. Science has unique ability for self-correction. Suggestions how to read and understand a scientific paper, even for non-scientists, are available on the Internet. Access to scientific bibliographic databases can be obtained through libraries or educational institutions. A user of the Internet should be aware of scientists or scholars whose claims are directed to issues which do not belong to their field of study (A chemist cannot evaluate if vaccine ingredients such as aluminium are safe for human bodies). Papers which were not published in peer reviewed magazines are of much less significance. There is a high risk that they are flawed and usually this is the reason why they were not accepted in peer review process. Also institutions or authorities are not relevant for judging claims (for example, legal institutions like courts have no competence to confirm or disprove scientific claims).

Second most reliable source (still in the higher part of pyramid), are quality media, both for professionals or for general audience (quality press). In order to gain reputation, the quality media are expected to be socially responsible. They have codes of conduct and they are legally responsible for published information. Journalists cannot voluntary publish anything. They have to make sure if their information is correct. For example, in 2011 the BBC Trust published a seminal report on the broadcaster's coverage of science. The author, Steve Jones, warned about "false balance" in the BBC's reporting of scientific issues, caused by attempts to pay attention to anyone, however unqualified, who shows an interest.[28]

Rather unreliable sources are various blogs and web pages – third level according to credibility of sources. Here, the Internet user has to be especially aware. One needs to ask important questions: Who is the author of the article? Is there any conflict of interest? (for example, physician who advocates alternative medicine has a private homeopathic practice). Is he an expert in the field he is writing about? Is he respected in related community of scholars and scientists? Does the article contain references to peer reviewed papers, academic, scientific or scholarly books? YouTube videos, various testimonies on forums and web pages referring to each other without any link or reference to primary source of information, are highly suspicious. Are the web pages that advocate new theories or findings associated with some products or services directly dedicated to sale? (for example, a web site about alkaline diet also sells dietary supplements like SuperGreens and Prime pH). If a user is not sure about reliability of information, he or she can use special keywords added to his/her online search to find out if there are any pages doubting its credibility (online search + "myth", "debunked", "quackery", "skeptic").

The base of the pyramid is represented by testimonies or claims made by relatives, friends or acquaintances ("I know a person who…", "I heard about a case where…"). It is the least credible source of information. Scientists and scholars refer to this reasoning as "anecdotal evidence". A person uses an experience or an isolated example instead of an argument or scientific evidence. Because the sample is small, there is high probability that information may be unreliable or biased ("My grandfather smoked a pack of cigarettes daily and lived until 89"). This type of evidence is irrelevant and yet most frequent. It should be avoided.

Scientifically literate persons and critical thinkers evaluate information obtained from the Internet by these standards. It is not surprising that the Pyramid of Credibility of uncritical persons, fans of conspiracy theories or believers in pseudoscience, is turned upside down. The least credible sources are the most appeal-

23   ČUPKA, M.: *Prečo ľudia potrebujú konšpiračné bludy.* [online]. [2014-01-26]. Available at: <http://zurnal.pravda.sk/spolocnost/clanok/306261-preco-ludia-potrebuju-konspiracne-bludy/>; KREKOVIČ, M.: *Konšpiračné teórie: všetko je inak.* [online]. [2010-05-06]. Available at: <http://www.sme.sk/c/5356884/konspiracne-teorie-vsetko-je-inak.html>.
24   *ritomsky.sk.* [online]. [2014-07-08]. Available at: <http://www.ritomsky.sk/>; *Priestori – informácie, inšpirácie, ideály.* [online]. [2014-07-08]. Available at: <http://www.priestori.sk/>.
25   *Lovci šarlatánov. Skoncujme so záplavou medicínskych nezmyslov, absurdít a očividných podvodov, ktoré sa dennodenne kopia a pribúdajú na rôznych weboch, diskusiách a fórach.* [online]. [2014-07-08]. Available at: <http://www.lovcisarlatanov.sk/>.
26   *Lovci šarlatánov: Nezmysel o prekyslení organizmu je nezničiteľný.* [online]. [2014-03-14]. Available at: <http://tech.sme.sk/c/7136022/lovci-sarlatanov-nezmysel-o-prekysleni-organizmu-je-neznicitelny.html>.
27   JASLOVSKÝ, M.: *Lovec šarlatánov Maroš Rudnay: Výučba kritického myslenia u nás úplne absentuje.* [online]. [2014-06-19]. Available at: <http://blog.mindshare.sk/2014/06/19/rozhovory/lovec-sarlatanov-maros-rudnay-vyuka-kritickeho-myslenia-u-nas-uplne-absentuje/>.

28   *Review of impartiality and accuracy of the BBC's coverage of science.* [online]. [2012-05-21]. Available at: <http://www.bbc.co.uk/bbctrust/our_work/editorial_standards/impartiality/science_impartiality.html>.

ing to them and the best verified ones are highly suspicious in their eyes. What can we do about that? Is there any proper way of communication that could be effective, if only partially? For example, persuasion of parents resistant to vaccination is highly unsuccessful.[29]

I would like to enclose my article with recommendation that is based on psychology of communication. Reading discussions between critical thinkers and laymen favoring pseudoscience, there is one clear misconception in critical thinkers – that uncritical audience can be persuaded by reasoning and evidence. And if they do not, they must be simply ignorant. But behind almost every questionable behavior there is a positive attitude. There are reasons why persons believe in something that is harmful for them. They just did not find a better way how to address their feelings of helplessness, confusion and anxiety. It is a coping strategy. Ignoring internal reasons even for bizarre beliefs predictably leads to feelings of rejection and makes all persuasion impossible.

One way how to respect the opponent is selective ignorance of his or her disrespectful behavior and lack of knowledge. The person needs to respect others even if they do not respect him. This is rarely seen in the discussions. A critical thinker is ready to immediately point to rhetorical fallacies of the opponent (argumentum ad hominem argumentum ad populum, etc.). But understanding and avoiding fallacies are meant to improve my thinking, not reasoning of the others. I cannot force others to think and behave rationally. This only triggers defense mechanisms. Honest self-reflection after criticism is a cultural myth. In reality, regardless if a person is right or wrong, anytime he or she is being accused, it is perceived as a threat. Emotions are stronger than reasoning because of their survival function (one needs to react immediately, lengthy thinking about danger could lead to death). So the criticized person easily loses control in the debate. Older parts of the brain take control and one of the three reactions occur: fight, flight or freeze response. Since the Internet offers sense of safety (there is no direct face to face confrontation on the Internet, in some forums it is possible to stay anonymous), fight is the most typical reaction here (expressed as trolling and flaming).

A critical thinker is reaffirmed in his assumption that it is pointless to discuss with radicals. However, even if he or she does not succeed in persuasion efforts and reasoning, there are others who are reading and watching the discussion. If they are laymen, they would be affected more by emotions in the debate than by arguments. Being ironic or sarcastic backfires any honest educational purposes. It is a form of aggressiveness. A critical thinker then can find himself or herself in a position of persuading of already persuaded. It is the same situation like in communities centered around various ideologies. How to avoid this trap?

The first step in overcoming objections is listening to opponent. What is the matter of disagreement? What she opposes and refuses to accept? Second step is expressing of understanding (empathy). A critical thinker should express that if s/he is in the situation of his/her opponent, s/he would probably feel and react the same way ("If I had such bad experience with health care system and doctors and read those articles about corruption of pharmaceutical corporations and dangers of vaccination, I would also hesitate to believe in the safety of vaccines."). Only in the third step a critical thinker can try to overcome objections, use his reasoning and skills to support his case and explain his point of view. In the last, fourth step, he can ask if his explanations were satisfactory or if there are any questions left. He needs to respect if the opponent refuses to change or challenge their own views. The first two steps are often omitted. A critical thinker passes right into arguing. In this way, it is hard to persuade even persons who are hesitating and undecided.

Social skills are equally important as thinking skills. Critical thinkers cannot put their faith into power of their sole reasoning, into their tools and methods. They need to earn respect and trust as the persons as well. Without them, all persuasive communication intended to inspire healthier choices, would be ineffective. It is blind submission to defensive emotions (fear, anger) and lack of awareness that can be considered as a root of illiteracy. However, only by recognizing the value of emotions, and acceptance of personal reasons for keeping certain beliefs, the reasoning and growth of awareness is possible.

29   NYHAN, B., REIFLER, J., RICHEY, S., FREED, G. L.: *Effective Messages in Vaccine Promotion:* A Randomized Trial. In Pediatrics, 2014, Vol. 133, No. 4, p. 835-842.

BIBLIOGRAPHY:

AINSWORTH, M. D., BELL, S. M.: *Attachment, Exploration, and Separation: Illustrated by the Behavior of One-Year-Olds in a Strange Situation*. In Child Development, 1970, Vol. 41, No. 1, p. 49-67. ISSN 0009-3920.

BARKUN, M. A.: *Culture of Conspiracy. Apocalyptic Visions in Contemporary America*. Berkeley, Los Angeles, London : University of California Press, 2003. ISBN 0-520-23805-2.

BRETHERTON, I.: *The Origins of Attachment Theory: John Bowlby and Mary Ainsworth*. In Developmental Psychology, 1992, Vol. 28, No. 5, p. 759-775. ISSN 0012-1649.

CAREY, S. S.: *A Beginner's Guide to Scientific Method*. Fourth edition. Wadsworth Cencage Learning, 2010. ISBN 1-111-30555-2.

CARROLL, R. T.: *Becoming a Critical Thinker: A Guide for the New Millennium*. Second Edition. Boston : Pearson Custom Publishing, 2004. ISBN 978-0536859341.

ČUPKA, M.: *Prečo ľudia potrebujú konšpiračné bludy*. [online]. [2014-01-26]. Available at: <http://zurnal.pravda.sk/spolocnost/clanok/306261-preco-ludia-potrebuju-konspiracne-bludy/>.

GÁLIK, S., CENKÁ, R.: *Twilight of Christianity in tele-view of the world. From homo religiosus to homo videns*. In European Journal of Science and Theology, 2013, Vol. 9, No. 5, p. 225-236. ISSN 1841-0464.

HASKINS, G. R.: *A Practical Guide to Critical Thinking*. [online]. [2014-07-08]. Available at: <http://skepdic.com/essays/Haskins.html>.

JASLOVSKÝ, M.: *Lovec šarlatánov Maroš Rudnay: Výučba kritického myslenia u nás úplne absentuje*. [online]. [2014-06-19]. Available at: <http://blog.mindshare.sk/2014/06/19/rozhovory/lovec-sarlatanov-maros-rudnay-vyuka-kritickeho-myslenia-u-nas-uplne-absentuje/>.

KAČINOVÁ, V., KOLČÁKOVÁ, V., PETRANOVÁ, D.: *Axiocentric media education as a strategy for the cultivation of media recipients*. In European Journal of Science and Theology, 2014, Vol. 10, No. 1, p. 103-116. ISSN 1841-0464.

KREKOVIČ, M.: *Konšpiračné teórie: všetko je inak*. [online]. [2010-05-06]. Available at: <http://www.sme.sk/c/5356884/konspiracne-teorie-vsetko-je-inak.html>.

KRUGER, J., DUNNING, D.: *Unskilled and Unaware of It: How Difficulties of Recognizing One's Own Incompetence Lead to Inflated Self-assessments*. In Journal of Personality and Social Psychology, 1999, Vol. 77, No. 6, p. 1121-1134. ISSN 0022-3514.

Lovci šarlatánov: Nezmysel o prekyslení organizmu je nezničiteľný. [online]. [2014-03-14]. Available at: <http://tech.sme.sk/c/7136022/lovci-sarlatanov-nezmysel-o-prekysleni-organizmu-je-neznicitelny.html>.

Lovci šarlatánov. Skoncujme so záplavou medicínskych nezmyslov, absurdít a očividných podvodov, ktoré sú dennodenne kopia a pribúdajú na rôznych weboch, diskusiách a fórach. [online]. Available at: <http://www.lovcisarlatanov.sk/>.

National Science Education Standards. Washington, DC : The National Academy Press, 1996. ISBN 0-309-05326-9.

NUWER, R.: *Alternative Medicine Is a $34 Billion Industry, But Only One-Third of the Treatments Have Been Tested*. [online]. [2013-06-18]. Available at: <http://www.smithsonianmag.com/smart-news/alternative-medicine-is-a-34-billion-industry-but-only-one-third-of-the-treatments-have-been-tested-879411/>.

NYHAN, B., REIFLER, J., RICHEY, S., FREED, G. L.: *Effective Messages in Vaccine Promotion: A Randomized Trial*. In Pediatrics, 2014, Vol 133, No. 4, p. 835-842. ISSN 0031-4005.

OFFIT, P. A.: *Do You Believe in Magic? The Sense and Nonsense of Alternative Medicine*. Harper, 2013. ISBN 9780062223005.

PETRANOVÁ, D.: *Rozvíja mediálna výchova v školách kritické kompetencie žiakov?*, In Communication Today, 2011, Vol. 2, No. 1, s. 66-83. ISSN 1338-130X.

PLENCNER, A.: Aktuálne témy v kritike masovej a populárnej kultúry. In MORAVČÍKOVÁ, E. (ed.): *Kultúra v premenách globalizácie*. Nitra : Univerzita Konštantína Filozofa v Nitre, 2012, s. 295-311.

POTTER, W. J.: Media Literacy. Third Edition. Thousand Oaks, New Delhi, London : Sage Publications 2005. ISBN 1-4129-0989-9.

Použime rozum. [online]. [2014-07-08]. Available at: <http://www.pouzimerozum.sk/>.

Priestori – informácie, inšpirácie, ideály. [online]. [2014-07-08]. Available at: <http://www.priestori.sk/>.

Review of impartiality and accuracy of the BBC's coverage of science. [online]. [2012-05-21]. Available at: <http://www.bbc.co.uk/bbctrust/our_work/editorial_standards/impartiality/science_impartiality.html>.

ritomsky.sk. [online]. [2014-07-08]. Available at: <http://www.ritomsky.sk/>.

THOMPSON, D.: *Counterknowledge: How we surrender to conspiracy theories, quack medicine, bogus science, and fake history*. New York, London : W. W. Norton & Company, 2008. ISBN 978-0-393-07046-0.

WOLFE, R. M., SHARP, L.K.: *Vaccination or Immunization? The Impact of Search Terms on the Internet*. In Journal of Health Communication: International Perspectives, 2005, Vol. 10, No. 6, p. 537-551. ISSN 1081-0730.