

Interdisciplinary Approaches to Challenges:

**LAW ENFORCEMENT,  
PSYCHOLOGY AND SECURITY  
IN FOCUS**

Edited by

*Imre Dobák – Johanna Farkas – Szabolcs Mátyás*



**LUDOVIKA**  
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# LAW ENFORCEMENT, PSYCHOLOGY AND SECURITY IN FOCUS





Interdisciplinary Approaches to Challenges:

# Law Enforcement, Psychology and Security in Focus

1<sup>st</sup> LEPSY CEEPUS Network

Research and Cooperation  
Conference Proceedings

12 March 2024

Edited by  
Imre Dobák – Johanna Farkas – Szabolcs Mátyás



**LUDOVIKA**  
UNIVERSITY PRESS

Budapest, 2025

The conference proceedings include papers presented at the 1<sup>st</sup> LEPSY CEEPUS Network, Research and Cooperation Conference (12 March 2024). The authors are solely responsible for the content of their papers.

The organiser of the conference: Ludovika University of Public Service

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Published by Ludovika University of Public Service

Ludovika University Press

Responsible for publishing: Gergely Deli, Rector

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Managing editor: Fanni Karácsony

Copy editor: Zsuzsánna Gergely

Layout editor: László Kőrösi

Printed and bound in Hungary

DOI: [https://doi.org/10.36250/01260\\_00](https://doi.org/10.36250/01260_00)

ISBN 978-963-653-191-1 (ePDF)

ISBN 978-963-653-155-3 (ePub)

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## Foreword

Ludovika University of Public Service has established the Law Enforcement and Psychology (LEPSY) CEEPUS Network with the objective of equipping future legal, law enforcement, police, fire, security and psychology professionals with the competences to address societal challenges through an interdisciplinary approach to education and research.

The LEPSY initiative unites academic institutions offering diverse educational programmes and research initiatives across various disciplines, including political science, international relations, law, law enforcement, sociology, criminology, criminalistics, security, psychology, etc.

The network's core comprises universities with an advanced educational and research infrastructure in this specific field of study, and the network's primary objective is to examine comprehensively the underlying factors and consequences of contemporary social processes. The establishment of transnational networks facilitates the exploration of contemporary research inquiries and the formulation of integrated responses through basic and applied research. An interdisciplinary approach to contemporary societal processes (e.g. the impact of migration, terrorism, war, mental health, etc.) enables a more profound comprehension of the underlying mechanisms, facilitating a more effective law enforcement response and psychological treatment. The exploration of such phenomena transcends national boundaries, and LEPSY offers a valuable opportunity to strengthen international connections and respond effectively to emerging challenges. Achieving success in addressing novel challenges necessitates the deepening of international cooperation through learning, education and joint interdisciplinary research.



The LEPSY CEEPUS Conference Book constitutes a collection of papers presented at the 1<sup>st</sup> LEPSY CEEPUS Network Research and Cooperation Conference, which was held on 12 March 2024. The overarching objective of the conference was to promote research on law enforcement and psychology issues in LEPSY CEEPUS Network partner institutions, with a view to strengthening collaboration between researchers. The conference encompassed a diverse range of topics, addressing contemporary issues in psychology, education, organisational behaviour and security studies. A significant proportion of the presentations focused on the intersection of cognitive processes and educational strategies, while another prominent theme was the application of psychological principles in organisational settings. Additionally, the conference delved into critical security and societal challenges, exploring the evolving patterns of terrorist operations and spontaneous radicalisation in small communities. The event also highlighted innovative methodologies, such as engineering approaches in forensic fire scene reconstruction and network researching methods for decision-making support, demonstrating the interdisciplinary nature of the research presented.

The LEPSY CEEPUS Network looks to the future with ambitions to further develop and deepen cooperation between partner institutions and facilitate the implementation of research projects. The Network's future goals include providing network members with additional opportunities for knowledge sharing, access to joint research projects and collaboration at the international level. The success of the conference would not have been possible without the efforts of the Ludovika University of Public Service, who provided invaluable organisation and support. The speakers and participants who contributed to the success of the conference should also be warmly thanked, and it is hoped that a significant proportion of these individuals will participate in subsequent conferences. The subsequent plans of the Network include the annual organisation of the conference, with the objective of continuous updating and expansion of knowledge in the LEPSY research domains.

The editors

Borbála Tamás – Laura Gábor

# The Impact of Visual Thinking Strategy Training on the Executive Functions and Visual Stimulus Preferences of University Students

## Abstract

Aesthetic judgment is influenced by the perceived values of the stimuli by the beholder; nevertheless, it is also determined by the cognitive characteristics of the perceiver (such as expertise and executive functions). Although previous studies have investigated the effect of independent characteristics (such as symmetry, complexity and order) of visual stimuli on aesthetic judgment, little is known about the multi-dimensional aspects of visual stimuli. Executive functions are high-order cognitive processes; despite their frequent occurrence in the literature, there is a research gap regarding the links between training in visual arts, aesthetic judgment and executive functions. Considering the lack of evidence in the literature, the aim of the current study was to investigate the effect of visual thinking strategy (VTS) training on aesthetic judgment and on inhibition control, and selective attentional processes. Non-art university students ( $N = 53$ ) were gathered and then distributed into two groups; the experimental group participated in a 7-session VTS training. We also investigated the electrical brain activity of experts ( $N = 2$ ) and novices ( $N = 2$ ) in visual arts. Our results indicate mixed results regarding the effect of VTS training on visual stimulus preferences between the two groups before and after training. Additionally, our results revealed significant differences between the two groups regarding reaction time in task and Flanker task. Although the results of EEG suggest functional differences between experts and novices, these results are only orientational.

**Keywords:** aesthetic judgement, visual thinking strategy, executive functions, EEG

## Introduction

### *Aesthetic judgement*

Aesthetic judgement can be described as appraisals of value determined by diverse aesthetic standards, which may originate from socially constructed cognitive evaluations or emotional encounters. Aesthetic judgment is considered to be a conscious decision-making process (EGERMANN–REUBEN 2020). Aesthetic judgement is influenced by the physical aspect of the stimuli. Hence, the physical attributes of the stimulus, including colour, arrangement, symmetry, visual intricacy and contrast, significantly influence the process, while individual traits such as age, education, familiarity and context also affect aesthetic preferences (BRAUN–DOERSCHNER 2019; KÄHLER et al. 2020). Previous studies primarily concentrated on examining the individual effects of order and complexity on aesthetic judgement. However, when exploring both order and complexity together, the manipulations of stimuli often lacked parametric control, typically focusing on specific forms of order (such as balance or symmetry), and sometimes neglecting the multidimensional aspects of order and complexity (VAN GEERT et al. 2023). Thus, in order to unravel individuals' aesthetic inclinations towards order and complexity, it is crucial to independently manipulate order and complexity with precise control; explore the interplay of both factors in relation to appreciation concurrently rather than in isolation; and recognise the multifaceted nature of both order and complexity (VAN GEERT et al. 2021). In addition to the physical aspect of the stimuli, knowledge also has an impact on aesthetic judgement. Experts tend to form their aesthetic judgement in a more independent way, they also tend to analyse art pieces more extensively on a higher order cognitive level. Nevertheless, understanding and interpreting art is not only enhanced by knowledge of art and regular exposure to artistic encounters, but it also alters how we perceive and emotionally engage with art (LEDER et al. 2015).

### *Visual thinking strategy*

Visual Thinking Strategies (VTS) curriculum is considered a teaching method that improves critical thinking. It uses art to enhance critical thinking by highlighting attentive listening, communication and collaboration. The method also enhances

reading, writing, comprehension and creative and analytical skills (HOUSEN 2002; LANDORF 2006). The method uses three questions that encourage novice viewers to contemplate evidence through questioning: “What is going on here?”; “What do you see that makes you say that?”; and “What more can you find?” (HOUSEN 2002). This method has been successfully adapted to other disciplines outside of the art, such as in medical education (REILLY et al. 2005; MUKUNDA et al. 2019); the results of a systematic review also provide support for the implementation of the VTS approach in the curriculum of medical education (CERQUEIRA et al. 2023).

### *Executive functions*

Executive functions refer to broad neuropsychological aspects of cognitive and behavioural capabilities. These advanced cognitive processes encompass planning, self-regulation, inhibitory control, goal-oriented behaviours like regulating conduct, and maintaining working memory and sustained attention (DAWSON–GUARE 2010; BARKLEY 2012). Executive functions, also known as cognitive control processes, are described as a comprehensive term encompassing cognitive processing guided by knowledge rather than automatic responses. Existing literature categorises the three-factor executive function model into three primary domains: inhibition, updating/working memory and shifting (KARR et al. 2018) or cognitive flexibility (DIAMOND 2013). Inhibitory control or cognitive control refers to behavioural regulation that aims to optimise purposeful actions while mitigating automatic responses, it is also associated with automatic and controlled responding abilities, therefore cognitive control expected to support controlled goal-directed and flexible responding (FRIEDMAN–ROBBINS 2022). Other scholars define executive functions as three EFs that are moderately correlated but distinctly identifiable: updating or maintaining working memory representations (updating or working memory, WM), inhibiting prepotent or irrelevant information and action tendencies (inhibition), and transitioning between various tasks or representations (cognitive flexibility or shifting) (MIYAKE et al. 2000).

Considering the results from the literature, the purpose of the present study is to investigate the effects of VTS methods on multidimensional visual stimuli preferences, nevertheless our aim is to examine the impact of VTS methods on inhibitory control processes.

Methods and results

Participants

42 non-artistic undergraduate students participated in the study, and convenience sampling was used. Regarding professional involvement in visual arts, 40 of the participants were not involved in visual arts (95.2%) and 2 were (4.8%) in terms of their profession. Participants were non-randomly divided into two groups, 20 participants in the control group and 22 in the experimental group (see Table 1).

Table 1: Sociodemographic characteristics of participants

	N	%
Gender		
Female	38	90.5
Male	4	9.5
Personal relationship with visual arts		
Not interested at all	1	2.4
Not really interested	6	14.3
Moderately interested	32	76.2
Very interested	3	7.1
Professional involvement in visual arts		
Involved	2	4.8
Not involved	40	95.2

Note: N = 42.

Source: Compiled by the authors.

The G\*Power program was used to calculate the number of participants needed to test the hypotheses. With a statistical power of .80 and an effect size of .25, two groups and three measurements, 28 participants are required. The recommended sample size was met.

Materials and measures

Eriksen and Eriksen (1974) developed the Flanker Task to assess selective attention and inhibitory control. Participants in the task react to the arrow directions (< >)

that are shown on the screen. Participants must react to the middle arrow's direction among the five arrows shown on the screen during each stimulus. The middle arrow points in the same direction as the others for congruent stimuli and in the opposite way for incongruent stimuli.

We utilised the Stroop interference task (STROOP 1935) to quantify response inhibition. This task consists of 40 trials and instructions. For each trial, the name of a colour appears on the screen, and it is indicated if the colour of the colour matches the text displayed (e.g. text "blue" in blue is compatible; text "blue" in red is incompatible). Every given text colour must be responded to with the matching set of letters. The average response time in milliseconds for the compatible trials extracted from the incompatible trials is known as the "Stroop effect".

### *Procedure*

Following enrolment in the study, individuals were allocated to either the experimental or control groups non-randomly. Participants were then provided with general information about the survey, including its topic, purpose, contact details and technical requirements for completion. Subsequently, written information was provided, and participants were given the opportunity to proceed with data collection upon giving consent. The pre-intervention pre-test was conducted in March 2023 for both groups, separated by a few days. Data collection was conducted using the online software interface PsyToolkit (STOET 2017), version 3.3.4. Questionnaire sizes were adjusted to fit the participants' screen sizes, with a resolution of 800 × 800 megapixels utilised for all cognitive tasks. Both groups were monitored throughout the data collection process. To ensure anonymity, participants were assigned individual identification codes for completing tasks. Additionally, verbal instructions were provided, and participants were allowed to take short breaks between tasks during data recording.

The Flanker task commenced with the presentation of an instructional page detailing task requirements. Participants were informed that the screen would display a series of five arrows (e.g. <<>><), and their objective was to respond to the direction of the central arrow promptly and accurately. In instances where the central arrow pointed left (>), participants were instructed to press the "A" key, while if it pointed right (<), they were to press the "L" key. Congruent stimuli featured a central arrow facing the same direction as the surrounding arrows, whereas incongruent stimuli involved the central arrow facing the opposite direction. A total of 40 stimuli were

presented during the task. Upon completion, participants were prompted to proceed by pressing the spacebar.

The Stroop interference task also commenced with instructional pages, wherein participants were presented with colour names (yellow, red, blue, or green) on the screen. The colour name displayed was either congruent or incongruent with the colour of the text (e.g. “blue” text displayed in blue is congruent, while “blue” text displayed in red is incongruent). Participants were instructed to respond to each stimulus by indicating the colour of the displayed text using a letter combination. A total of 40 stimuli were administered during the task. Feedback was provided to participants upon completion of the task through the calculation of the Stroop effect score, which represents the average reaction time of congruent trials subtracted from incongruent trials and is measured in milliseconds.

Following the pre-test phase, the experimental group commenced their intervention, which was integrated into the psychology of art course. This intervention spanned 2 hours, twice a week, over the course of 7 consecutive weeks. The content of the intervention centred on presenting key art historical movements, including the Renaissance, Baroque, Rococo, Romanticism, Impressionism, Cubism, Realism, Art Nouveau, Modernism and Postmodernism. Each artistic movement was explored through the analysis of 3 to 5 works, which were collectively examined by the group within the framework of methodological considerations regarding visual thinking strategies. Following the analysis of each artwork, participants engaged in brief periods of individual reflection before collectively discussing their observations and responses for 5 to 15 minutes per artwork. During the intervention, participants were introduced to VTS methods.

After the intervention phase, both the experimental and control groups underwent reassessment, separated by several days. The reassessment encompassed stimulus preference sequences and computerised cognitive tests, with participants in both groups receiving identical instructions and tasks as those administered during the pre-test phase. It is important to note that the control group did not undergo any post-test intervention.

Based on speculative research in neuropsychological imaging, we examined the cortical electrical neuron activity of four participants during a traditional visual inhibition task conducted using the Emotiv BCI (brain–computer interface) and Emotiv LABS software with the Emotiv Epoc X headset. The algorithm captured both task progression and real-time brain activity. The study encompassed the following sensory areas: FC<sub>5</sub>, T<sub>7</sub>, P<sub>7</sub>, O<sub>1</sub>, O<sub>2</sub>, P<sub>8</sub>, T<sub>8</sub>, FC<sub>6</sub>, F<sub>4</sub>, F<sub>8</sub> and AF<sub>4</sub>, with electrode placement following the international 10–20 electrode standard. The EEG resolution

was as follows: LSB =  $0.51\mu\text{V}$  (14-bit mode),  $0.1275\mu\text{V}$  (16-bit mode) and bandwidth ranged from 0.16 to 43 Hz. Raw channel data were processed using artificial intelligence, and upon task completion, performance metrics were computed, including engagement level, cognitive stress, attention, reaction time and accuracy. All metrics, except for reaction time, were quantified on a 100-point scale.

### *Research design*

A quasi-experimental non-equal group pre-test–post-test design was used in the study. Data were gathered prior to, during, and following the intervention; the groups were not assigned at random; and the control group did not receive the intervention at the follow-up.

### *Data analysis*

SPSS version 27 was used to process the data. Mean values, standard deviation, minimum, maximum, skewness and kurtosis indices, boxplots and visual inspection of histograms were among the tools used in descriptive data processing. Repeated measures ANOVA was used to test the hypotheses, which assessed the difference in the means of the two groups at three different time points.

### *Results*

We used repeated measures ANOVA to examine the effect of the intervention on executive functions along the two groups. The first condition of the repeated measures analysis of variance was met for the dependent variables, the functions were assessed on a ratio scale. The second condition was also met, there were two groups with three repeated measures. The fourth criterion of normal or near-normal distribution, with logarithmic correction, was met.

The assumption of sphericity was evaluated using Mauchly's Test. The results indicated that the assumption of sphericity was not violated,  $\chi^2(2) = .88, p > .05$ . The effect of time along the Flanker effect was not significant,  $F(2.80) = 1.04, p > .05, \eta^2 = .02$ . The group effect was not found to be significant,  $F(1.40) = 4.00, p > .05, \eta^2 = .09$ . The interaction effect



Table 2: Means, standard deviation and repeated measures analysis of variance results

Variable	Experimental		Control		ANOVA			
	M	SD	M	SD	Effect	F ratio	df	$\eta_p^2$
Flanker effect								
Time 1	-.01	.05	.03	.05	G	4.00	1	.09
Time 2	.01	.04	.02	.04	T	1.04	2	.02
Time 3	.03	.04	.02	.03	G $\times$ T	4.29*	2	.09
Stroop effect								
Time 1	.03	.04	.01	.05	G	.51	1	.01
Time 2	.04	.04	.03	.09	T	2.35	2	.05
Time 3	.04	.04	.05	.04	G $\times$ T	.87	2	.02

Note:  $N = 42$ . ANOVA = analysis of variance; G = Group;

T = Time; G  $\times$  T = Group  $\times$  Time. \* $p < .05$ .

Source: Compiled by the author.

of the time\*group was found to be significant with a medium effect size,  $F(2.80) = 4.29$ ,  $p < .05$ ,  $\eta_p^2 = .09$ . The reaction time of the experimental group ( $M = .03$ ,  $SD = .04$ ) was slower after the intervention than that of the control group ( $M = .02$ ,  $SD = .03$ ).

The assumption of sphericity was evaluated using Mauchly's Test. The results indicated that the assumption of sphericity was not violated amongst the Stroop effect values,  $\chi^2(2) = .64$ ,  $p > .05$ . The time effect is not significant,  $F(2.80) = 2.35$ ,  $p > .05$ ,  $\eta_p^2 = .05$ . There is no significant effect of group,  $F(1.40) = .51$ ,  $p > .05$ ,  $\eta_p^2 = .01$ . No significant interaction effect was found for the time\*group effect,  $F(2.80) = .87$ ,  $p > .05$ ,  $\eta_p^2 = .02$ . Following the intervention, there was no significant difference in the experimental group's ( $M = .04$ ,  $SD = .04$ ) and control group's ( $M = .05$ ,  $SD = .04$ ) reaction times (Table 2).

We used repeated measures ANOVA to examine the effect of the intervention on preference score along the two groups. The non-significant result of Mauchly's Test of Sphericity,  $\chi^2(2) = .92$ ,  $p > .05$ , suggests that the assumption of sphericity was upheld in the analysis of preference scores for visual stimuli. The time effect was significant with a large effect,  $F(2.80) = 8.03$ ,  $p < .01$ ,  $\eta_p^2 = .16$ . The group did not show a significant effect,  $F(2.40) = 0.00$ ,  $p > .05$ ,  $\eta_p^2 = .00$ . The interaction effect for time\*group was found to be not significant,  $F(2.80) = 1.46$ ,  $p > .05$ ,  $\eta_p^2 = .03$  (Table 3).

In a further analysis we investigated the electrical brain activity of experts ( $N = 2$ ) and novices ( $N = 2$ ) in visual arts. EEG results suggest functional differences between experts and novices, these results are only orientational (Table 3).

Table 3: *EEG results of visual inhibitory task*

	<i>Art experts</i>		<i>Non-artists</i>	
	1	2	3	4
Variables				
Accuracy	99	88	100	87
Reaction time	374	380	381	388
Cognitive stress	30	30	48	62
Attention	53	59	44	52
Involvement	50	51	51	59

*Note:* N = 4

*Source:* Compiled by the authors.

## Discussion

In the present study we investigated the impact of the VTS method on visual stimulus preferences and executive functions. Our results revealed that there is a statistically significant effect for time on stimulus preference. This suggests that there was a change in Stimulus preference across the three different time periods. The main effect for time was significant. The value obtained for time in this study suggests large effect size. However, our results also revealed no statistically significant differences in stimulus preference between the two groups, suggesting no effectiveness of the intervention. This result can also be interpreted as a consequence of mere exposure effect (ZAJONC 1968; BORNSTEIN – CRAVER-LEMLEY 2022).

Regarding the influence of the VTS method on executive functions, our results indicate no differences between the two groups across time periods in Stroop effect. This result can be interpreted as being influenced by the effect of cognitive fatigue, as discussed by Junior et al. (2020), in both groups.

Data analysis revealed statistically significant interaction effect between time periods and groups, with a medium effect size on flanker task results. The reaction time (RT) of the experimental group was slower compared to the RT of the control group, suggesting greater flanker effect on the experimental group. This result partially is in line with previous study results. The results from the study of Miknevičiute et al. (2023) revealed flanker effect growth over time periods as a result of acute stress effect. While stress was not directly addressed in this study, given the timing of the

last measurement (the week before the exam period began) and the nature of the VTS instructions, which involve response delay to stimuli, it can be inferred that these factors contribute to the observed increase in the flanker effect within the experimental group.

The result of the EEG study indicates differences between art experts and non-artists regarding the measured variables that suggests functional differences between the level of expertise. Despite the differences in the reaction time, these results are only orientational and qualitative, thus further investigation are needed for generalisable conclusions.

### *Limitations*

One major limitation of this study is the data collection process; although participants completed tasks individually, they were seated in a group setting. Another limitation stems from the inconsistency in the literature, as there is a lack of consensus regarding the definition of executive functions.

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Kamil Strzępek

# AI in Law Enforcement, Education, Healthcare and the Response from European Institutions

## Abstract

Artificial Intelligence (AI) is not merely a technological advancement but represents a revolutionary approach to many processes occurring in everyday life. AI can impact, among other things, the teaching and learning process (Education) or the prevention, screening and treatment of diseases (Healthcare). Finally, AI may have an impact on Law Enforcement and the Judicial system in general. The first purpose of the research was to show that AI may be applied similarly in Education, Healthcare and Law Enforcement, that is, to support decision-makers and/or as a fully automated decision-making entity. The second purpose of this research was to provide a glimpse at the response of the European Union (EU) and the Council of Europe to the development of AI. The results of the analysis showed that it is indeed possible to point to similar types of situations in Education, Healthcare and Law Enforcement, where AI is applied. At the same time, the work on the regulations of European Institutions seems to take into account the different types of situations in which AI is applied. The method used in this paper is of a descriptive character with references made to scientific, popular science literature and legal acts.

**Keywords:** Artificial Intelligence, law enforcement, police service, human factor, European Union, Council of Europe

## Introduction

Artificial Intelligence (AI) may be understood as the substitution of machine logic for human cognition (LIBICKI 2021). In other words, AI tries to make computers do the same things that minds do (BODEN 2018). This represents a revolutionary approach to many processes that occur in everyday life. AI and its technologies are present in, among other things, Education, Healthcare and Law Enforcement (understood not only as criminal law). The first purpose of the research was to show that AI may be used similarly in Education, Healthcare and Law Enforcement, that is, to support decision-makers and/or as a fully automated decision-making tool. The second purpose of the research was to give a glimpse at the response of the European Union (EU) and the Council of Europe to the development of AI.

The method used in the paper is of a descriptive character with references made to scientific, popular science literature and legal acts. The formal requirements of the publication limit these considerations. This paper was presented at the 1<sup>st</sup> LEPSY Central European Exchange Programme for University Studies (CEEPUS) Research and Cooperation Conference organised by Ludovika University of Public Service on 12 March 2024 (online).

## AI in Education and Healthcare

AI may impact, among other things, the process of providing and receiving an educational service (Education) or the process of prevention, screening and treatment of diseases (Healthcare).

AI may support the process of providing an educational service by making some “teaching tasks” easier (from a teacher’s perspective). As a first example, we may refer to AI, which can gather data on student learning behaviour and plan the best teaching path for educators (CUI et al. 2018). As a second example, we may refer to computing to construct virtual classrooms and virtual laboratories by fusing physical space with virtual space (JAIN–RAGHURAM 2024). This is an example of scientific assistance, whose task is to create a “friendly scientific environment”.

AI may also support the process of receiving an educational service by making some “learning tasks” easier (from a student’s perspective). As a first example, we may refer to real-time language translation during the learning process (İÇEN 2022). It makes global information much more accessible to students everywhere and may be

considered an aid in the process of acquiring knowledge. In the second example, we may refer to AI that may help learners with hearing or visual impairments. For example, it may convert text to speech and speech to text to enable people with visual, hearing, or speech impairments to access content, ask questions and communicate with their peers (UNESCO 2023a).

The above-mentioned examples are typical of technologies that help in the process of providing and receiving educational services.

However, we may also point to chatbots enabling students to receive extensive answers in many areas of knowledge (JAIN–RAGHURAM 2024). This is more of an example of a self-teaching technology (without human intervention). The student receives an educational service (knowledge) not from a human (teacher) but “from technology” (a chatbot).

The above-mentioned methods, that is, those that do not assume human intervention and/or participation in the learning and/or teaching process, may pose threats to those whom the education system is intended to serve. Stuart J. Russell drew attention to certain threats that the above-mentioned AI technologies (methods) may pose: “Firstly, they cannot – or could not – have a conversation with the student, answer questions or develop a relationship. Another problem is that AI tutoring systems do not understand the content that they teach. They might present content about chemistry, but they do not understand chemistry, which means that even if they were able to have a conversation with the student, they could not answer questions properly” (UNESCO 2023b: 17). This shows that the lack of awareness on the part of AI may harm the conscious recipients of services provided by AI. This especially occurs when AI is not controlled by humans.

Moreover, AI that does not assume human intervention and/or participation in the learning and/or teaching process may pose a threat to the entire system of education of a state. First, the state and its education system may lose their capacity to teach because of a lack of teachers. This may occur in crisis situations that cannot be ruled out, that is, when AI is unable (even temporarily) to perform its tasks. Second, we should consider what to do with teachers being replaced by AI. Third, the question arises as to whether and when the operation of AI can be attributed to humans or authorities. This last issue is important for the broader vertical relationship between an individual and authorities (also in the context of individual rights and freedoms).

There are some similarities between AI applications in Education and Healthcare. Analysing medical data, making predictions, assisting in diagnoses and supporting



treatment decisions are the main ways that AI is applied in Healthcare. These are situations in which AI is supportive.

However, there are also many manual, automated and AI tools in robotic surgery (BOAL et al. 2023). AI may also eliminate many routine diagnostic tasks currently performed by radiologists and pathologists. “Among the medical specialities most poised for transformation by AI are those involved in interpreting visual data for diagnostic purposes – namely pathology, radiology, and dermatology. Companies are rapidly developing AI systems that automate tasks, such as analysing tissue slides, medical images, and skin lesions, to detect diseases. These technologies promise greater efficiency, accuracy, and consistency relative to human specialists in identifying potential tumours, fractures, and skin conditions” (GEORGE–GEORGE 2023).

### AI in Law Enforcement

There are objective prerequisites and reasons for applying AI to Law Enforcement. “They are conditioned upon the fact that modern policing is required to solve many issues – reducing crime, optimisation of law enforcement agencies, improving the efficiency of resources to ensure the activities of law enforcement agencies, increasing public confidence in law enforcement, and reduction in corruption” (DEMPSEY et al. 2023). However, it is also emphasised that the role of AI in Law Enforcement, from the perspective of law enforcement agencies and their officers, varies considerably depending on general familiarity with the concept of AI and how much individual jurisdiction employs these technologies in their communities (DEMPSEY et al. 2023).

In addition to criminal law, AI is used in other areas of public law. As in the case of Education and Healthcare, in the case of Law Enforcement, we can point to AI aimed at helping decision-makers and fully automated decision-making. Surveillance may monitor communication, and sensors and trackers in mobile phones “can be used to monitor or infer locations, transactions, and character traits, including needs, preferences, and interests of individuals” (CUSTERS 2023). In the above-mentioned manner, AI supports decision-making in the public sector. The results of surveillance are supervised and assessed by decision-makers (law enforcers) (BINKOWSKI 2023).

It is said that a secret source of power of surveillance is “the secret massive-scale extraction of human-generated data” (ZUBOFF 2022). People leave a lot of digital tracers everywhere. This makes surveillance effective. It is also said that “the lawful abolition

of secret massive-scale extraction is democracy's Golden Sword that can interrupt the power source upon which all surveillance capitalism's destructive economic operations, governance takeovers, and social harms depend" (ZUBOFF 2022).

There are numerous examples of AI fully automated decision-making in Law Enforcement which may also be defined as a technology that "sets the rules and enforces compliance with these rules, without any intervention of human enforcers" (CUSTERS 2023). Automated Border Control e-gates may be an example of fully automated decision-making. They are currently operating in most airports worldwide. Facial, fingerprints and iris recognition algorithms allow (or not) to pass passport control (automatic gate). These algorithms simultaneously set rules and enforce compliance with these rules at the same time without human intervention (SANCHEZ DEL RIO et al. 2016; KOWALCZEWSKA-KIJEWSKA 2022). A typical example of private law is an online provider of products and services that unilaterally sets terms and conditions. If a consumer rejects accepting such conditions, they will not have access to the service.

Bart Custers distinguished two major ways in which AI (technology) plays an increasingly important role in Law Enforcement, namely via surveillance and via technoregulation. He understands technoregulation as a technology that "sets the rules and enforces compliance with these rules, without any intervention of human enforcers" (CUSTERS 2023).

Cinara Rocha and João Carvalho pointed out eight main uses or possible uses of AI in the Judicial system (ROCHA-CARVALHO 2022): 1. Similar cases "push systems" (they are designed to automatically "push" similar cases to help judges and staff reflect on specific cases); 2. Litigation risk assessment systems (based on judicial statistics and analysis of similar cases; they provide basic information that could evaluate possible judgment results in advance); 3. Document-assisted generation systems (designed to help judges write judicial documents); 4. Speech to text systems (they convert spoken language into written text used in courtroom records or hearings); 5. Risk prediction systems (they are used in the penal system and are supposed to predict risks for violent crime, sexual crimes and recidivism); 6. Chatbots (they answer questions submitted to the Judiciary via a keyboard or verbally concerning a relevant case, verdicts, laws, how to bring a lawsuit, how to investigate legal rights and how to obtain evidence); 7. Emotions recognition systems (they can identify the speaker's emotional state); 8. Filtering systems (they organise information according to a defined criterion and take action, such as grouping cases and returning or allocating cases to judges).

## The response of the EU and the Council of Europe

The European Commission for the Efficiency of Justice (CEPEJ) of the Council of Europe adopted in December 2018 the first European text to set out ethical principles relating to the use of AI in Judicial systems (European Commission for the Efficiency of Justice – CEPEJ 2018). CEPEJ has identified the following core principles to be respected in the field of AI and justice: principle of respect of fundamental rights, principle of non-discrimination, principle of quality and security, principle of transparency, impartiality and fairness; principle “under user control”.

In December 2023, the European Parliament and the Council of the European Union reached a political agreement on the AI Act (European Commission 2023). The new rules will follow a risk-based approach: minimal risk (AI systems identified as minimal risk will benefit from free-pass and absence of obligations); high-risk (AI systems identified as high-risk will be required to comply with strict requirements including human oversight; it will include, among other things, administration of justice and democratic processes), unacceptable risk (AI systems considered a clear threat to the fundamental rights of people will be banned; for example, systems that manipulate human behaviour); specific transparency risk (AI systems such as chatbots – in this case, users should be aware that they are interacting with a machine; deep fakes and other AI-generated content will have to be labelled as such). Companies that do not comply with the rules will be fined (European Commission 2023).

As announced on the Commission’s website fines will range from €35 million or 7% of global annual turnover (whichever is higher) for violations of banned AI applications, €15 million or 3% for violations of other obligations and €7.5 million or 1.5% for supplying incorrect information (European Commission 2023).

The above-mentioned “regulation” may be named a world-first attempt at the horizontal regulation of AI systems. However, this “regulation” is not free from criticism (VEALE – ZUIDERVEEN BORGESIUUS 2021; THELISSON–VERMA 2024).

## Conclusion

AI and its development are changing every aspect of our lives and posing serious ethical and regulatory challenges. This requires work at both national and international levels. The most frequently cited risk associated with AI in the literature is bias, which may violate fundamental rights and result in discrimination (ROCHA–CARVALHO 2022).

It can be concluded that Education, Healthcare and Law Enforcement experience significant developments in AI. This study presents two types of situations involving AI. First, AI supports decision-makers. Second, AI is a fully automated decision-making system. This applies to all the three areas discussed. Processes related to data collection and analysis may be examples of the first situation. Chatbots are an example of a second situation. Given the EU's risk-based response to AI, it is safe to say that the first type of situation can be covered (in principle) by high-risk regulations. The second situation (mainly chatbots) is covered by specific transparency risk regulations.

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## Predicting Fear of War: The Predictive Role of Transdiagnostic Vulnerability Factors

### Abstract

The fear related to war and war-like circumstances is rarely analysed and literature lacks studies on this topic. The purpose of the present study was to investigate the sociodemographic and psychological vulnerability-related predictors of fear of war in the context of the outbreak of the Ukraine–Russia war. Transdiagnostic vulnerability factors, namely intolerance of uncertainty, neuroticism and stress–tense were examined in the context of war-related fear in a non-clinical Hungarian speaking sample from the warzone neighbouring countries. Data were collected through an online survey. A sample of  $N = 1,460$  participants (aged  $M = 43.67$ ,  $SD = 13.54$ , 92.1% female) completed the Fear of War Scale (FOWARS), the Stress subscale of the Depression, Anxiety and Stress Scale (DASS-21), the Neuroticism subscale of the Big Five Inventory and the Intolerance of Uncertainty Scale (IUS-12). Hierarchical multiple regression analysis was performed for predictor weight calculations related to demographical variables, and psychological vulnerability factors with fear of war as the outcome variable. The models were statistically significant. From the sociodemographic variables, female gender and age were found to be predictors of fear of war; females and younger individuals presenting higher levels of fear. The most influential psychological factors that predicted fear of war were the participants' stress level ( $\beta = .38$ ,  $p < .01$ ) and the intolerance of uncertainty ( $\beta = .34$ ,  $p < .01$ ). The results show that in times of war-related crises transdiagnostic vulnerability traits are associated to fear of war, and younger women are particularly at risk.

**Keywords:** fear of war, intolerance of uncertainty, neuroticism, stress, transdiagnostic vulnerability

## Introduction

The pandemic and the Russia–Ukraine war have disrupted feeling of security in Europe. Neighbouring countries faced fear and anxiety in the early weeks of the Russia–Ukraine war. On hearing news of refugee masses, numerous individuals experienced fear, anxiety and worry. Citizens of Romania and Hungary showed fear of war right after the armed conflict began and this fear has persisted (PRICOP 2023; ÁRPÁSI 2022). Stress vulnerability and stress susceptibility are important factors that influence individual responses in stressful situations, as discussed by Schmidt et al. (2010) and Ebner and Singewald (2017). Extended dread in settings where control is limited can lead to chronic or toxic stress (MURRAY 2017; SHERN et al. 2016). The uncertainty of the situation is a trigger to stress response and distress among individuals (MAZLOOMZADEH et al. 2022; SATICI et al. 2020). The level of distress is moderated by individual vulnerability factors. According to the Hierarchical Taxonomy of Psychopathology (HiTOP) by Kotov et al. (2017), neuroticism is a primary vulnerability component, but intolerance to uncertainty is classified as a secondary vulnerability factor in the development of anxiety disorders and fear reactions as proposed by van der Heiden et al. (2010). Research has demonstrated that a low tolerance for uncertainty plays a moderating function in the connection between advanced personality traits and anxiety disorders (YANG et al. 2015).

According to Carleton et al. (2007), intolerance of uncertainty (IU) is described as an individual's inability to tolerate the unpleasant feelings caused by the lack of important, crucial, or adequate knowledge, which is intensified by the feeling of ambiguity. IU contributes to catastrophic misinterpretations, anxiety and worry reactions (HEBERT–DUGAS 2018). Neuroticism, as a personality trait, increases the likelihood of anxiety and the prevalence of main negative affect in persons in a transdiagnostic framework (KOTOV et al. 2010). Neuroticism is linked to heightened responsiveness to ambiguous threats and concern acts as a mediator in the relationship between neuroticism and anxiety. Neuroticism associates also fear in unpredictable situations (ZHANG et al. 2022).

## *Aim*

The study aimed to investigate how transdiagnostic variables (stress reaction, IU, neuroticism) affect fear of war in the days following the start of an armed conflict between Russia and Ukraine. Literature is scarce on knowledge in such specific events and with the present study we obtained data on a seldomly analysed socio-cultural context.

## Measurements and methods

### *Participants*

A total of  $N = 1,460$  participants completed the scale, most of them female, mostly from Hungary, fewer from Romania (Transylvania). All participants' mother tongue was Hungarian, and they were adults aged 18 and over. The sample was heterogeneous in terms of age, education and place of residence. Sociodemographic characteristics of the participants and descriptive statistics for other measured variables are presented in Table 1.

Table 1: *Descriptive data of the participants*

$(N = 1,460)$		
Age (M $\pm$ SD)		18–83 (43.67 $\pm$ 13.54)
Gender	Female	1,344 (92.1%)
	Male	116 (7.9%)
Country	HU	1,162 (79.6%)
	RO	298 (20.4%)
Education level	10 grades/grade 10 or less	51 (3.5%)
	High school/baccalaureate	387 (26.5%)
	College, university	690 (47.3%)
	Master's degree	289 (19.8%)
	Doctor's degree	43 (2.9%)
Residency	Capital city	528 (36.2%)
	City	642 (44.0%)
	Village	290 (19.9%)
FOWARS (M $\pm$ SD)	Fear of war	1–5 (2.80 $\pm$ 0.95)
DASS (M $\pm$ SD)	Stress subscale	0–21 (7.10 $\pm$ 5.87)
Big Five Inventory (M $\pm$ SD)	Neuroticism subscale	8–40 (22.78 $\pm$ 7.17)
IUS-12 (M $\pm$ SD)	Intolerance of uncertainty	12–60 (33.25 $\pm$ 11.17)

*Note:* Values represent frequency and percentage, unless indicated otherwise. M: mean, SD: standard deviation.

*Source:* Compiled by the authors.



*Measurements***Fear of War Scale  
(FOWARS)**

The Fear of War Scale (FOWARS) (KÁLCZA-JÁNOSI et al. 2023) is a self-report 16 item scale designed to measure fear of war. Respondents indicate how typical the statements on the scale are for them on a 5-point Likert scale ranging from 1 (not at all typical of me) to 5 (very typical of me). The total score is calculated as the average of the item scores, with higher scores indicating greater fear of war. In this article, the internal validity of the full scale is excellent, with Cronbach's  $\alpha = .94$ .

**Stress – Depression,  
Anxiety and Stress Scale  
(DASS-21)**

The Depression, Anxiety and Stress Scale (DASS-21) (LOVIBOND–LOVIBOND 1995) is a self-report scale designed to measure symptoms of three negative emotional states – depression, anxiety and stress. Individuals were asked to indicate the symptoms they had experienced in the previous week. Each item is scored from 0 (did not apply to me at all over the last week) to 3 (applied to me very much or most of the time over the past week). Higher scores indicate higher levels of anxiety. The stress subscale was used in this study, the Hungarian version being adapted from Szabó (2010). The Cronbach's  $\alpha$  value of the stress subscale was .91.

**Neuroticism – Big Five Inventory**

The Big Five Inventory (JOHN–SRIVASTAVA 1999; JOHN et al. 2008) is one of the most widely used scales for assessing personality traits. Neuroticism was assessed using 8 items from this inventory. Participants indicated the extent to which they agreed or disagreed with each statement on a 5-point Likert scale (0–4). The internal consistency of the scale was good (Cronbach's  $\alpha = .87$ ).

### Intolerance of Uncertainty Scale-12 (IUS-12)

The Intolerance of Uncertainty Scale-12 (CARLETON et al. 2007), in its shortened form, was used to test the propensity to consider or respond negatively to unknown circumstances. Respondents are asked to rate the extent to which each statement applies to them on a 5-point Likert scale ranging from 1 (not at all characteristic of me) to 5 (very characteristic of me). In this study the scale shows good internal consistency (Cronbach's  $\alpha = .92$ ).

### *Procedure*

An online cross-sectional study was carried out between 10–20 March 2022, at the outbreak of the Russia-Ukraine war. Convenience sampling method was applied. Informed consent was obtained, and anonymity was assured. Inclusion criteria were: age 18 or above, Hungarian speaking Romanian and Hungarian citizens (two neighbouring countries with a history of Russian occupation in the past).

### *Data analysis*

Multiple hierarchical regression models were conducted to assess the predictors for the dependent variable of fear of war, with a threshold for the selection of  $p < 0.05$ . In the first model independent variables were demographical information such as age, gender, education level, country where the participant lives and the type of settlement. The second model contains in addition to demographical variables three transdiagnostic vulnerability factors, namely intolerance of uncertainty (IUS-12), neuroticism (Big Five Inventory) and stress-tense (DASS-21). All assumptions for the multivariate hierarchical regression were fulfilled.

## Results

Multiple hierarchical regression analysis was performed for demographical variables, transdiagnostic vulnerability factors and fear of war (see Table 2). The first model was

Table 2: Hierarchical multiple regression models with fear of war as dependent variable

	Model 1			Model 2		
	B	SEB	$\beta$	B	SEB	$\beta$
(Constant)	3.482	.166		1.340	.148	
Age	-.022	.002	-.297**	-.004	.002	-.058**
Sex_male	-.549	.088	-.156**	-.311	.064	-.088**
Education	.014	.029	.013	-.002	.021	-.002
Country_HU	.273	.069	.115**	.092	.050	.039
Type_settlement_big city	.076	.054	.038	.057	.039	.029
Type_settlement_village	-.045	.065	-.019	.019	.046	.008
Stress				.061	.004	.377**
Neuroticism				.008	.004	.059*
Intolerance of uncertainty				.029	.002	.341**
adjR <sup>2</sup>	.094**			.536**		
$F_{(df)}$	26.258 <sub>(6,1453)**</sub>			188.465 <sub>(9,1450)**</sub>		
$\Delta R^2$	—			.441**		

Note: \* $p < .05$ . \*\* $p < .01$ ; categorical variables were introduced in the model as dummy variables; dependent variable: fear of war (FOWARS).

Source: Compiled by the authors.

statistically significant ( $F(6,1453) = 26.25, R^2 = .94, p < .01$ ), demographical variables explained 9% of the variance of fear of war.

Younger age is responsible for 30.0%, the female gender is responsible for 16.0% and Hungarian citizenship is responsible for 11.0% of the change in fear of war scores.

The second model was also statistically significant ( $F(9,1450) = 188.46, R^2 = .53, p < .01$ ) and all added variables were statistically significant positive predictors of the fear of war. The most influential factors were the participants' stress level ( $\beta = .38, p < .01$ ) and the intolerance of uncertainty ( $\beta = .34, p < .01$ ) (Table 2).

## Discussions and conclusions

With a sense of security already shaken by the pandemic around the world, the outbreak of the war between Russia and Ukraine has once again challenged belief in

security (PRICOP 2023; ÁRPÁSI 2022). In such times of uncertainty and crisis in society fear appears and for survival, the ability to distinguish between danger and safety is essential. Considering the military conflicts related to the Russia–Ukraine war, the objective of our study as to identify psychological vulnerabilities as predictors of fear of war in a non-clinical sample from warzone neighbouring countries immediately after the outbreak of the war.

The fear of war is activated in people as a normal reaction to a real threat, but some of them are more affected. Certain psychological vulnerability factors may lead to stronger fear reactions at physiological, emotional and behavioural levels, adversely affecting well-being and mental health (SATICI et al. 2020). Prolonged fear in low-control situations may result in chronic or toxic stress (MURRAY 2017; SHERN et al. 2016). Hajek et al. (2023) found that fear of war was associated with higher likelihood of depressive and anxiety related symptoms. Moreover, the costs of increased fear of war should be considered also on a societal level because it has an impact on politics and economy.

Neuroticism, intolerance of uncertainty and general stress reaction as transdiagnostic vulnerability factors were the main object of our investigation as they were consistently found to be related to fear expression to threat. Beyond these psychological variables, several sociodemographic variables were also included in the model to determine the most vulnerable sociodemographic subgroups.

Our results revealed that in line with existing literature showing gender-specific and age-related differences in fear reactions (BOEHNKE–SCHWARTZ 1997), the phenomenon of the fear of war was indeed present in the sample, particularly in younger women.

The present study highlighted that stress response and intolerance of uncertainty strongly and positively predicted fear of war, while the effect of neuroticism on fear of war was also significant.

Intolerance of uncertainty compromises fear extinction, while extinction-resistant fear is a central feature of pathological anxiety and an important transdiagnostic dimension in mental health disorders (e.g. MORRISS et al. 2021; MORRISS et al. 2016). Previous research consistently found that fear of Covid-19 was associated with intolerance of uncertainty (MAZLOOMZADEH et al. 2022; SATICI et al. 2020).

In the context of the pandemics Mazloomzadeh et al. (2022) suggested that individuals with high neuroticism have stronger emotional reactions and fewer resources to cope with stressful circumstances beyond their personal control. Previous research consistently found that fear of Covid-19 was associated with neuroticism (MAZLOOMZADEH et al. 2022; TROISI et al. 2021; CACI et al. 2020; ZHANG et al. 2022).

Similarly to the context of the Covid-19, the outbreak of a nearby war created threat and situational uncertainty with low levels of control over the course of events.

People vary in their ability to handle difficulties and challenges, as well as in the amount of distress they experience (LAZARUS–FOLKMAN 1984). According to Selye (1956, 1964), stress is the organism's non-specific response to a stimulus that disrupts its natural condition of balance and requires adaptation. War-related events hold a high risk for mental health risk and the unfavourable outcomes are usually stress related (MURTHY–LAKSHMINARAYANA 2006; ROZANOV et al. 2018). Our data suggest that immediate stress reaction of individuals was predictive for the level of war-related fear they declared. The potential explanation can be found in individual stress vulnerability (SCHMIDT et al. 2010) and stress susceptibility (EBNER–SINGEWALD 2017) which are transdiagnostically relevant variables.

In conclusion, it appears to be plausible that transdiagnostically vulnerable individuals – mostly young women – who have high levels of uncertainty intolerance and neuroticism with elevated stress reactions are the most vulnerable to expressing war-related fear reactions.

The results of the present study regarding the predictive role of transdiagnostic vulnerabilities, neuroticism, intolerance of uncertainty and stress on the fear of war are worthy of reflection and require further studies. The identification of vulnerable subgroups allows the selective implementation of prevention programs based on psychological support and counselling. Our results confirm the legitimacy of interventions to promote the development of uncertainty tolerance. Personal vulnerability characteristics like high neuroticism and elevated stress reactions may also be taken into consideration for a better prioritisation of interventions.

### *Limitations*

The current study markedly extends the limited knowledge on the phenomenon of the fear of war. However, several limitations are worth bearing in mind. Even though a suitable and relatively large sample was used for the current study, one drawback is the use of cross-sectional data collecting and the other is the design of the study which has clear limits regarding assumptions of causality. Therefore, employing a longitudinal research design to test the relationships described here would yield more valid findings. Another limitation in generalising the results lies in the fact that only indirectly

affected regions and civilians were targeted in the present study. Studies on Ukraine or Russian civilians or refugees could nuance the results. In addition, a non-clinical sample was used for this study. Professionals applying the findings of the study to the clinical population should be cautious.

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## Engineering Methods in Forensic Fire Scene Reconstruction

### Abstract

During a fire, the design of the building affected by the fire changes. Combustible materials are damaged and destroyed, structures are deformed by heat, surfaces are covered by smoke. The problem is that finding out what has happened on a changed scene can be difficult in a court case. In the present research, the researchers investigated how the tools and methods of traditional fire investigation scene inspection requires engineering solutions to perform a scene reconstruction based on engineering methods, presented credibly and visually in a forensic proceeding. The research analysed the process of fire investigation procedures today. The methodology and tools for conducting a fire investigation scene inspection, the elements and interrelationships of the static and dynamic phases, and the sampling options were examined. They evaluated the scene recording based on engineering methods, the methods of measurement and representation. The researchers analysed the reconstruction possibilities arising from the scene survey methodology, from which reconstruction models were created using conventional 2D as well as 3D representations. The analyses found that by introducing additional dimensions, such as time, new reconstructions that simulate processes can be created. As a result of the research, it was established which engineering data needs to be captured for the forensic application of state-of-the-art computer aided reconstructions in order to show valid results.

**Keywords:** fire investigation, fire safety, engineering methods, fire scene reconstruction

## Introduction

In forensic evidence proceedings, the exact evidence forms the basis of the proceedings. To this end, the professional recording and collection of decisive evidence is a primary task. In the course of fires, the design of the buildings affected by the fire changes to varying degrees. Combustible materials are damaged and destroyed, structures are deformed by heat and surfaces are covered by smoke. During the fire brigade intervention, combustible materials may be removed or the scene may be altered to varying degrees.

### *Problems*

The problem is that it is difficult to find out what has happened at a scene that has changed in any way. In a court case, an accurate reconstruction is the basis for a complex representation of events. Nowadays, a reconstruction of the scene, reconstructed with engineering precision and presented in a credible and visual way in a forensic proceeding, is of paramount importance.

### *Objectives*

For the above reasons, the researchers, who previously served as professional fire investigators, aim to investigate how the tools and methods of a traditional fire investigation scene inspection require engineering solutions to perform a scene reconstruction based on engineering methods, presented credibly and visually in a forensic proceeding. The aim is to develop an engineering approach and data-driven methodology for fire investigation procedures.

### *Research methods*

In terms of the research methods used, the researchers analysed the process of fire testing procedures today. They examined the methodology and tools for conducting a fire investigation scene inspection, the elements and interrelationships of the static and dynamic phases, and the sampling possibilities. They evaluated the scene recording

based on engineering methods, the methods of measurement and representation. The research analysed the reconstruction possibilities arising from the scene survey methodology, from which reconstruction models were created using conventional CAD-based 2D and 3D representations. A comparative analysis between the traditional methodology and the engineering-based methodology was performed.

### *Literary overview*

A literature search was carried out, reviewing the classic literature and the most recent scientific publications of today. They reviewed key contributors to the scientific literature on domestic fire investigation. The works of László Bérczi, László Fentor, Ferenc Varga, L. Zoltán Nagy provide a comprehensive overview of the classic Hungarian fire investigation procedures, which are basically based on forensic principles. David J. Icove and Gerald Haynes' internationally recognised seminal works *Kirk's Fire Investigation* and *Forensic Fire Scene Reconstruction*, as well as NFPA 921 Fire Investigation Standard describe the methodology of a complex fire investigation. The researchers also reviewed recent publications on fire investigation to keep abreast of current trends. For this purpose, they reviewed, among others, the works on fire investigation published by Flores N. Quiroz and co-authors in the *Fire Safety Journal*, the Interpol fire investigation summaries from 2016 to 2022 published by Michelle Evans and co-authors in *Forensic Science International: Synergy* and searched the publications on databases by Marina Klees and Safa Evirgen, and the articles on BIM and GIS data-based research by Jicao Dao and co-authors. The authors reviewed the most significant literature published in the last 20–25 years and most relevant to their research, from P. Mark L. Sandercock to the recent work on machine learning database construction published by Angelo Aloisio and co-authors.

### *Hypothesis*

Based on the above, the researchers hypothesise that more accurate and visual scene reconstructions can be made from engineering-based data, with valid results compared to forensic methods, from traditional fire investigation scene reconstruction procedures, and that the data can be compared in an exact manner with data used in fire prevention.

## The fire investigation scene visit

Fire investigation is an activity that aims to establish the objective truth of a relevant event in the past. We seek to understand the conditions before the fire, the cause and effect of the fire. In the course of the cognitive activity, facts are established, correlations are discovered and problems are solved. A specific layer of cognitive activity consists of thinking activities (such as logical methods, the application of philosophical theorems, searching, organising, algorithm building). To achieve the objective, the activity must comply with the relevant procedural rules, be planned, conscious and characterised by a unity of intellectual and practical activities.

### *Stages of fire investigation cognition*

- Reconnaissance: Finding out the historical facts, collecting data, processing data and providing the necessary conditions.
- Proof: The data collected during the procedure must be legally relevant and must be accessible and understandable to everyone, therefore, the data must be obtained in an appropriate manner and their veracity must be proved in accordance with the principles and rules of proof (HARDING et al. 2022).

### *General elements of fire investigation*

- Methodology: The procedural rules that regulate or systematise the tasks of the fire investigator.
- Tactics: For the on-site inspection, for the hearings. (Parallel is also possible, which increases speed.)
- Technical procedures and their application: Photography, video recording, sampling (ICOVE et al. 2013).

### *Basic requirements for fire testing*

- respect for the rule of law
- completeness of the evidence

- objectivity
- speed
- data protection, data management (ICOVE et al. 2017)

### *Requirements in the description of the scene*

- a description of the external environment of the fire
- a description of the fire environment
- description of the area damaged by the fire (building structures, objects, materials)
- findings on the components necessary for combustion
- conditions that facilitate or hinder the spread of fire
- the facts concerning threats to persons, property and the natural environment
- other factors relevant to the fire test (ICOVE et al. 2017)

### *Analysis of the acts on the ground*

The protocol to the Fire Investigation Rules Act states: “During the fire investigation procedure, the authority shall immediately conduct a fire investigation scene visit” (Decree 44/2011 (XII. 5.) of the Ministry of the Interior; FENTOR–VARGA 2016).

The fire investigator should document the circumstances of the sampling, if necessary, the description of the objects and remains seized (HARRISON 2013). The conduct of the search is a very thorough, meticulous documentation of the facts observed only, which must be recorded by the person conducting the search and for which he is responsible for its accuracy, authenticity and completeness. During the investigation, it is possible to seize physical evidence and take samples of material remains. The investigation consists of a static and a dynamic phase, similar to a criminal inspection (BÁNÁTI 2022).

### Static phase

The static phase includes a kind of situational picture, where what is seen is recorded. Things and phenomena at rest are the object of observation. The traces of the fire and the conditions of the scene are visually perceived and recorded. During the static phase

of the investigation, only equipment (camera, video camera, rangefinder) that does not alter the original state of the scene may be used. The main objective of the static phase is to determine the location of the fire (FENTOR–VARGA 2016).

### Dynamic phase

The dynamic phase is the exploratory part of the investigation, where the initial state is changed. This is a very delicate part of the procedure because it is an irreversible process in most cases. During the fire investigation process, only statutory evidence can be considered by the fire investigator, of which the following can be recorded on the spot:

- customer declaration
- hearing of a witness
- document
- inspection report
- material evidence (SERVIDA et al. 2023)

The protocol and physical evidence are only linked to the scene and, due to the nature of the incident, can be used for a limited period of time, as it is obvious that, for example in the case of a residential building, the owner of the damaged property will want to restore the original state as soon as possible, and the guarding of the area may also tie up police resources. The rules for the investigation of fires also set out the requirements for the content and format of the scene investigation report. It should be noted that fire investigators are trained by police personnel in the techniques of evidence recording for use during the on-site investigation in the framework of a specialised training course at the Police Education and Training Centre of the National Police Headquarters in Dunakeszi, which is directly based on the fire investigator training course. This advanced fire investigation training course introduces trainees to the procedures for searching for, recording, packaging and authenticating traces and residues. In addition, the police experts will teach the criminal tactics of forensic photography, forensic sketching and crime scene investigation. The skills taught in the course are essentially basic knowledge of the forensic investigation procedure. A professional description of the crime scene can only be carried out with the necessary professionalism if the knowledge acquired in this course is used (BÉRCZI–VARGA 2016).

The description of the scene should include a description of the external environment of the fire, a description of the surroundings of the fire, a description of the area damaged by the fire (building structures, objects, materials), findings on the components necessary for the combustion, the conditions that facilitated or hindered the spread of the fire, the facts concerning the danger to persons, material goods, the natural environment and other factors relevant to the fire investigation.

One can agree that the on-site inspection is indispensable, urgent and irreplaceable. If the inspection is carried out in an unprofessional or sloppy manner, the procedure may be followed, but there is little chance of legal action being taken after the official procedure, particularly in relation to personal liability for the findings in connection with the fire.

It is therefore the responsibility of the fire investigators to evaluate the fire scene based on the burns, to draw conclusions about the time and place of the fire, the possible sources of ignition and the conditions that may have caused the combustion process (EVANS 2023).

## Scene reconstruction

### *Imaging*

Imaging is an important task in both the static and dynamic phases of the inspection. The images obtained should be suitable for showing the scene and the damaged area, the conditions and lesions indicating the location and spread of the fire, the factors facilitating and hindering the spread of the fire and the factors relevant to the investigation. The imaging tasks may be carried out using a variety of photographic and video recordings (ÉRCES et al. 2017).

### *Traditional types of photography*

- Environmental photos (showing the scene's surroundings)
- Overview pictures (showing the scene)
- Pictures of the Knot Point (showing part of the scene)
- Detail shots (a type of a photograph that can be taken during both the static and dynamic phases of the inspection, to highlight details of changes, damage or deterioration of objects) (BÉRCZI–VARGA 2016)





Figure 1: *Full panoramic images of a fire inspection*

Source: Picture taken by András Király, fire investigation expert, using a Ricoh Theta Z1 with  $2 \times 210^\circ$ .

### *Traditional photographic methods*

- panorama ( $360^\circ$  shot)
- meeting (photos taken from two directions)
- crossing (photos taken from 4 directions)
- scale (detail photographed next to a measuring stick)
- specific (e.g. photographing a corpse) (CHOI-YOH 2017; Figure 1)

### *Examination of the hearing of persons*

The hearings and their subsequent usability and interpretability are also critical to the success of the procedure. Witness interviews, as an investigative act, can also be conducted by authorised and trained persons. It is necessary to interview witnesses with primary direct experience of the incident, but also persons in possession of information relevant to the case, if they can provide information that is material and relevant to the fire investigation (QUIROZ et al. 2021a).

The discussion of interview tactics is not the subject of this article, but it is an important element of knowledge for the person conducting the procedure. This knowledge includes verbal and non-verbal communication, psychology, the ability to look for logical connections, the ability to understand cues to hidden information and the ability to control the conversation (QUIROZ et al. 2021b). Listening to witnesses can, of course, be done at a later stage, but the information relating to the event observed may be distorted, especially in a person who has been through a stressful situation, and the possibility of recalling it decreases over time, and the distorting effect of other information from the environment should not be ignored. It is for this reason that it is mentioned as an equally urgent fire investigation activity to be carried out at the scene, which is an important element of the field data collection. Interviewing tactics can be learned in a communication course by those who are assigned to fire investigation work (NFPA 921 2024).

### *Testing of samples containing accelerant materials*

Combustion residues containing accelerant substances can be captured on scene for a short period of time due to their volatility, and therefore samples taken and transported professionally should be subjected to analytical testing within a short time. The primary task of the experts at the Institute is to support the work of fire investigators with high quality research and well-supported test results (LENTINI 2018).

The work of the research institutes is closely linked to fire investigation, as they also carry out analytical tests to determine the presence of accelerants. Materials taken during fire investigation scene visits are analysed using a gas chromatograph coupled to a mass spectrometer to look for the presence of accelerants in the sample (SANDERCOCK 2008). In order to ensure good quality sampling and uniformity of implementation, the research institute (in Hungary) has developed a lockable, verifiable sampling system for fire investigators, called “sampling unit pack”, which is controlled by the institute for purity, thus avoiding unwanted contamination that could affect the investigation (BÉRCZI–VARGA 2016).

The sampling unit pack contains 4 sampling units, of which the Test sample bottle is filled with a sample from the location where the presence of an accelerant is suspected, the Control sample bottle is filled with a sample from the same location as the Test sample, and the Blank sample is taken from a location where no accelerant



Figure 2: *Sampling unit package*

Source: Compiled by the authors.

is suspected. The Traveling Blank Sample Bottle is not filled because it is designed to exclude possible storage and transport contamination.

## Engineering methods in scene reconstruction

Traditional scene reconstruction methods also serve well to support forensic procedures. But why talk about engineering methods? The researchers' aim in researching engineering reconstruction was twofold. On the one hand, they were looking for an engineering-based solution that would provide exact data but also be illustrative. On the other hand, they wanted to strengthen the feedback to the fire prevention field by collecting, recording and implementing engineering data (ALOISIO et al. 2024). To this end, engineering methods were integrated into the static and dynamic phases of the scene inspection and applied during the reconstruction (ÉRCES-BÉRCZI 2018).

*Engineering methods used in the static phase*

In addition to the traditional scene survey methods, the structural design of the building, the layering and the quantity and quality of the building materials were also recorded during the static phase. In this way, building information with a content similar to that of the building design was created. Once the data had been recorded on scene, the database could be created in batches. In the static phase, a comprehensive record was made of the changes in surface geometry using the imaging techniques mentioned above, which formed the basis for the comparability of the measured data during the reconstruction. 3D field photography and surface scans allow reconstruction measurements approximating real measurements even after imaging (CHOWDHURY et al. 2024).

*Engineering methods used in the dynamic phase*

In the dynamic phase, the researchers recorded the extent of changes indicating the location of the fire. In the static phase, they recorded the measured values of changes, deformations, discolourations and material losses on the materials studied, which were assigned to the information of the building material (STAUFFER 2020). The difference between the data on the initial building structure before the fire and the data on the damaged structure after the fire showed the exact extent of the damage, from which, in addition to the geometry (location of the fire, direction of fire spread), the intensity of the combustion process and the time of the fire can be deduced from the measured data. An engineering scene inspection based on measurements may, on the basis of the above, complement or challenge the information provided by witness and/or client interviews (DE WOLF et al. 2023).

*Engineering methods used in scene reconstruction*

In the static and dynamic phases, the researchers organised the data collected using engineering methods into a database, and then used the measurements and imaging technology to provide the surveyed scene with the information they had collected about the building (KLEES–EVIRGEN 2022). Building information modelling was used for this process (STEEN–HANSEN et al. 2021). The method allows the creation of a 3D



Figure 3: *Fire*

*Source:* Picture taken

by the Budapest Disaster Management Directorate.

building model with exact geometric parameters, which allows the reconstruction of the scene in a very accurate and measurable way. In addition, the model of the reconstructed scene can be presented in a very visual way to non-specialists, i.e. it can serve as evidence in forensic proceedings. The fire in the picture was photographed during the fire brigade intervention at the full-grown stage of the fire. The first photographic images were therefore taken after the fire was fully engulfed in flames and do not allow the place of origin of the fire to be established (DAO et al. 2024; Figure 3).

The post-fire image taken during the on-site inspection of the fire investigation procedure identifies the final stage of damage, but shows a homogeneous picture due to the high loss of material. The authors have integrated the measured and collected data on the burned condition with respect to the fire origin and the direction of fire spread (XING et al. 2016; Figure 4).





Figure 4: *Post-fire picture*

Source: Picture taken by the

Budapest Disaster Management Directorate and the authors.

For the reconstruction, engineer-precise floor plans and sectional drawings were prepared, which were used to create a 3D model of the part of the building affected by the fire (Figure 5).

The original condition was reconstructed on projection drawings and the data recorded by engineering methods was integrated into the model as building information, in which the fire-damaged structure of the original condition (structural elements in red) was visualised and distinguished from the structural elements that were less affected or removed during the intervention (ZENG et al. 2022; Figure 5).

Compared to a normal 3D model, the model reconstructed in the fire investigation procedure is a BIM model with building information integrated with the collected data, which allows for a comparison with the expected safety level in the fire prevention field (Figure 6).

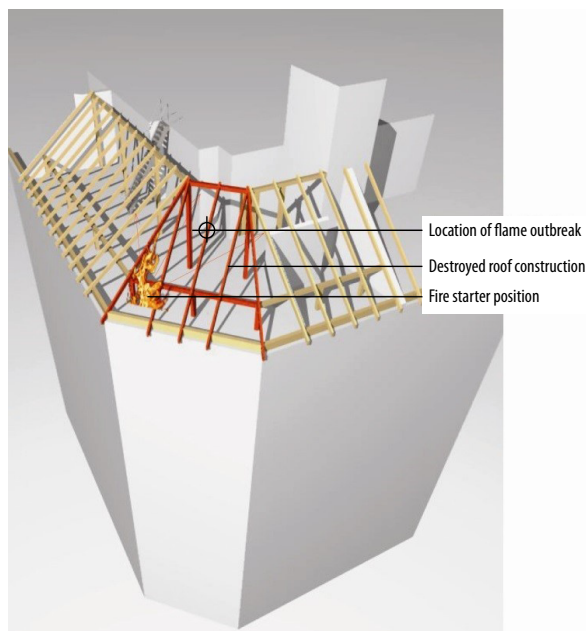


Figure 5: 3D digital reconstruction of a scene using engineering methods

Source: Compiled by the authors.

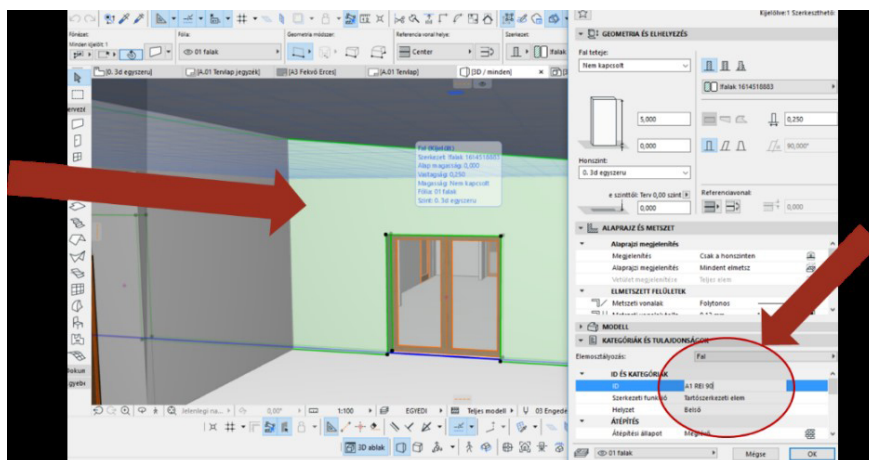


Figure 6: Integration of data into a Building Information Model (BIM)

Source: Compiled by the authors.

The reconstruction can be done in a standard way using the above method. The model is a 3D model with building information according to the IFC standard, which has the advantage of being implementable in validated fire simulation software such as the FDS (Fire Dynamics Simulator) simulator (ZHENG et al. 2023).

## Summary

The researchers analysed and evaluated domestic fire testing procedures with an international perspective. They found that the reconstruction methods used in today's fire investigation procedures are more accurate and visual than scene reconstruction generated from engineering-based data. Measured results of the extent of deterioration, the rate of material loss compared to temperature, and evaluations of the behaviour of building material in a real-scale fire can be well reconstructed using building information models.

During the analyses, the authors found that by introducing additional dimensions, e.g. time dimension, building information dimensions, newer reconstructions simulating complex processes (FDS) can be created. Simulations that represent complete processes are illustrative and the factual data captured by engineering methods are valid. As a result of the research, the researchers found that the forensic application of state-of-the-art computer-aided reconstructions requires the recording of engineering data for the reconstruction, which is partly a field-based and partly a research-intensive task.

Based on the summarised conclusions, the researchers concluded that, compared to traditional fire investigation scene reconstruction procedures, engineering-based data with valid results for forensic procedures can be used to produce more accurate and visual scene reconstructions, the data from which can be compared in an exact manner with data used in fire prevention.

## Conclusion

From the above, it can be concluded that data collected by engineering methods can be reconstructed in a modellable way and used as accurate, valid evidence in a forensic proceeding. By applying them, complex processes can be visualised.



### *Suggestion*

By introducing the time dimension, using properly validated simulation software, the further research proposal is to create complex simulations, whereby the data generated by the reconstruction and simulation of real-scale fires can be factually fed back into the field of fire prevention.

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Hedvig Szabó

# Redefining Security in the Digital Age: Navigating the Evolving Landscape of AI-Induced Risks

## Abstract

The emergence of Artificial Intelligence (AI) has fundamentally altered the security landscape, presenting novel challenges and opportunities. I examine the complicated relationship between AI and security, emphasising the transformative impact of AI on traditional security paradigms. It examines how malicious actors exploit AI for criminal activities, thereby escalating the complexity and severity of cybercrimes. The study highlights the evolution of cybercrime types due to AI solutions, underscoring the role of psychological manipulation and deepfake technologies in creating new avenues for deception and disinformation. The emergence of the “Crime as a Service” (CaaS) model on dark web marketplaces is a testament to AI’s versatility, enabling criminals to commission offenses without technical acumen. The CaaS model offers services on a subscription or pay-per-use basis, encompassing a range of activities from cybercrimes like phishing and DDoS attacks to other organised crimes. In conclusion, the paper underscores the dual nature of AI in the modern era, acting as a tool for innovation and efficiency in legal sectors, while simultaneously amplifying the capabilities of criminal enterprises, thereby challenging existing legal and security frameworks.

**Keywords:** Artificial Intelligence, security, Crime as a Service

## Introduction

Artificial Intelligence (AI) is a part of our everyday lives, as we encounter AI-enabled solutions in all our activities, whether at work or at play.

There is no area of society that can no longer be examined from the perspective of how AI has shaped and transformed a particular social subsystem and how it impacts on the way we live. It goes without saying that the rise of AI has not been without its impact in the field of security, to highlight just a few examples:

- we can observe the social debate that has developed around autonomous vehicles in the field of road safety
- the impact of the questions of the applicability of surveillance systems for security purposes on the exercise of fundamental rights
- how cyberattacks affect the business continuity of public and commercial actors
- whether the use of generative AI can influence the outcome of elections or be used for disinformation activities

However, the paper does not address the relationship between AI and security in general, but focuses on one segment of it, the potential for crime in the AI age to be driven by the use of AI. With regard to crime, it should be noted that the analogue world before the information society was also characterised by the fact that law enforcement detected crimes committed by criminals after the fact, i.e. law enforcement went after the criminals. Crime in general is characterised by its flexibility in responding to social change, constantly innovating and looking for ways to achieve its goals more easily and reduce the risk of being caught. This is true regardless of the technology, but technology brings additional opportunities. All subversive-emerging technologies have attracted crime at the same time as they have emerged and have immediately exploited their potential, in much the same way that the emergence of the railways has attracted the emergence of rail looters.

The aim of this paper is, on the one hand, to take stock of the impact of AI on crime, the emergence of new types of risks that can be assessed in the context of AI from a criminal law point of view and, on the other hand, to draw attention to the growing phenomenon of what is known as “crime as a service”, that is to say, AI allows crimes to be committed without skills and competences, because crime can be used as a service.

## Changes in crime as technology evolves

Emerging technologies in recent times – mobile phones, the internet (MILLER 2009) – have provided new opportunities for criminals. With the advent of the Internet, crime has recognised these and the question is being seriously raised, as we can read in the description of David Wall’s seminal work *Crime and the Internet*: “Is the Internet really powerful enough to allow a sixteen year old to become the biggest threat to world peace since Adolf Hitler?” (WALL 2001).

An intense change in crime is currently taking place, triggered by the emergence of AI in technology and then by the response of criminals. AI – but now also Information and Communications Technology (ICT) – has brought a newness that was unprecedented, which is why a 16-year-old hacker may be threatening world peace.

In November 2022, Interpol organised a forum (Interpol 2022) on the use of emerging technologies in law enforcement. Basically, how law enforcement colleagues can deal with the challenges posed by the digital world, such as new types of Web 3.0 (WAHEED et al. 2023) based crime. The consensus among professionals is that there is a risk that crime will outpace law enforcement.

In 2020, Europol produced a summary on “Malicious Uses and Abuses of Artificial Intelligence”, indicating that the link between AI and crime is growing. On the one hand, criminals are using AI to facilitate their own situation by “finding” new victims, making more profit in a shorter time, creating more innovative criminal models. They also have new possibilities to disguise their own activities, reducing the risk of being caught. These new opportunities bring constant changes in the world of crime that pose significant challenges for law enforcement and security in general.

## Crime as a Service (CaaS)

Lately AI has become a product in its own right, available for a fee or even free of charge. On the online marketplaces, both individuals and business users have many opportunities to use different types of AI applications. Business users offer this as a service to consumers, similarly to other digitalisation solutions. This allows the user to use it and in a way that he or she needs, individually.

It can therefore be concluded that AI “as a service” model has become widespread. In reality, it is a business model, i.e. AI can be used as a service, it does not require mathematical or ICT knowledge to use it, it is available to anyone, it can be bought.

If we approach the use of AI from the perspective of legality, we can see that much of it is used for legitimate purposes within a legal framework. However, there are also ways in which those who use AI are, on the contrary, motivated by unlawful purposes, i.e. to commit crimes.

However, it is worth clarifying that AI is not itself lawful or unlawful. It is merely a tool that can be used for different purposes, and the intention and purpose of the user will determine whether the tool will serve the public good or whether it will assist in the commission of a crime.

It is now clear that the use of artificial intelligence is widespread, and that it is not only law-abiding citizens who benefit from it for legitimate purposes, but also criminal circles.

Well-organised criminal groups with substantial financial resources have many opportunities to use the latest technologies, including AI, and are increasingly doing so. In contrast, ad hoc criminals or groups that are not the best organised may not use their own technology, but may rely on services provided by others. Marketplaces have developed on the dark web, similarly to those on the surface web, where goods and services can be purchased (KING et al. 2020). Among the illegal goods and services available on dark web marketplaces are criminal services: the buyer orders the crime to be committed and the seller agrees to perform it.

The crime as a service model is organised along the following principles:

- It “democratises” the commission of crime: offenders can purchase crimes, including cybercrimes, without technological knowledge, with the financial benefit falling on the offender rather than the service provider.
- The dark web is becoming more valuable: the anonymous marketplaces on the dark web provide an excellent opportunity to match and transact between the parties who want to commit the crime and those who can provide the service.
- Operating a subscription or pay-as-you-use model: similarly to the legal online economy, the crime as a service model in dark web can be operated by subscribing to the service or by paying before use, whichever is more appropriate depending on the type of crime. A constant phishing email campaign or ordering a specific DDoS attack is the goal.
- Specialisation and professionalism: the provision of crime as a service is characterised by increasing specialisation, with service providers specialising in one type of crime, not offering a full spectrum of activities, but performing that one type of crime with professionalism.

- Ease of access: the offender does not have to create the means of committing the offence and develop the method of execution himself, because these are available from the service provider, so the offence is open to anyone who wants to commit it.
- The complexity of offences can be increased: it is possible to order different offences from several service providers for a single target. This allows the victim's exposure and the success of the crime to be maximised.
- The model can be used not only in cybercrime: currently, cyberattacks in the dark web as a service are seen as the most feasible, but it can also be used for any crime that is organised online, such as money laundering, drugs and human trafficking.
- Continuously evolving business model: the CaaS model builds on the experience of legal business models, adopting best practices and successful strategies such as customer rating systems and service guarantee schemes.
- A challenge for law enforcement: cybercrime is a challenge in itself for law enforcement, due to the difficulty of detection. In case of this particular model, the *modus operandi* of the offence adds to the difficulty of detection.

On this basis, AI poses a significant risk as it increases the potential of offenders and may thus lead to an expansion of what Europol calls the criminal sharing economy.

Social engineering is the art of tricking users into revealing their data, which can then be used by hackers to gain access to ICT networks or user accounts. Cybercriminals exploit the fact that humans are the weakest link. Because people are basically well-intentioned and helpful, they are easily fooled and can therefore be targeted by virtually anyone (Trend Micro 2019). Hackers rely on basic human trust and the fact that users simply do not look for subtle signs of deception.

Phishing attacks are typically social engineering crimes. At present, most phishing attacks are indiscriminate and untargeted (GRECO et al. 2023).

Generic messages are used which are tailored to big brands or current events, but it is expected that only a few users will fall victim to the attack. For this reason, the attacker tries to send as many digital messages as possible to make the attack worthwhile even if the response rate is low.

There is also a variant of phishing where only certain individuals are targeted, known as spear-phishing. AI has increased the effectiveness and success rate of phishing attacks by creating more authentic-looking (sometimes perfect) messages, for example by using information extracted from social networks or by spoofing the



style of a trusted partner. Rather than sending uniform messages to all targets, which in most cases are unlikely to hit the mark, AI-enabled phishing tailors messages to exploit specific vulnerabilities of individuals. This effectively automates spear-phishing.

In addition, artificial intelligence-enhanced learning could be used to discover “what works” in phishing. And by varying the details of the messages, based on the data extracted from them, it is possible to maximise profits (LEONOV et al. 2021).

Deepfake is an information communication technology where a previously non-existent video recording of someone is created by converting existing image and sound files into a video recording that can be used to deceive by appearing real. Deepfake technology gained worldwide attention in 2018 with Jordan Peele’s fake video of former U.S. President Obama insulting President Trump and warning of the dangers of deepfake media.

Deepfake technology has the potential to influence people, as people tend to believe what they see–hear, and take what they see–hear as real. Researchers have also shown that fake video images can induce false testimony (GRANOT et al. 2018). Visual evidence is vivid, activating multiple areas of the brain, which can make it very persuasive. At first, they do not even think that what they perceive is not real at all, they have difficulty determining whether a visual or audio recording is real or fake. This has the potential to fundamentally change public confidence in audio–video technology.

This loss of trust in technology is of particular importance in law enforcement, as audio and video sources (CCTV cameras, mobile phone videos, body cameras and dashboard-mounted camera images) regularly used as evidence by law enforcement agencies can determine the success of a criminal prosecution and bring a new era of evidence evaluation, where the credibility and authenticity of evidence must be proven (DAUER 2022).

## Conclusion

Although we are only at the beginning of the AI era, we have already gained practical experience of the harmful, offending effects of AI, in addition to its many benefits. No technology, such as AI, is inherently dangerous, but the opportunities that its use opens up offer criminals a much wider perspective than in the pre-AI era. Crime has adapted flexibly to technology and, with the advent of AI, has begun to use it to improve its own illegal activities. The use of AI in crime first radically reshaped crimes committed in the digital space. Alongside cybercrime, the proliferation of deepfake

could fundamentally challenge the evidence system in criminal proceedings and the authenticity of image and audio recordings. The potential for AI-enabled capabilities will reinforce the proliferation of “Crime as a Service”. Of course, in the offline world, there have also been crimes that were not carried out by the criminals themselves, but were commissioned as a service from specialised “experts”. But first digitalisation, and then artificial intelligence has provided an additional alternative by making some of the crimes available to anyone as a service that can be bought.

It is clear that technology is also bringing a new era in crime. Crime will exploit the full potential of technological advances and new phenomena will emerge that the security sector has not yet encountered.

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## Is There Satisfaction Beyond Pleasure? Motivational, Demographic and Sexual Functioning Predictors of Life Satisfaction in Self-Perceived Sex Addiction

### Abstract

There is a lack of studies on the life satisfaction of persons with sex addiction, although outcomes of sexual addiction and problematic online sexual activity (e.g. problematic pornography use) have been documented to influence a wide range of variables associated with sexual well-being, sexual health and overall well-being of individuals. Using a correlational, non-experimental design, the present study targeted the motivational (self-determination theory) and sexuality predictors of life satisfaction in a sample of 229 adults (age  $M = 26$ ,  $SD = 10.09$ ) with self-perceived sex addiction from Hungary and Romania. The design was elaborated based on Self-Determination Theory (SDT). Results obtained based on the multiple linear regression analysis indicated that self-determination, demographic variables (i.e. educational level and marital status), as well as sexuality related characteristics accounted for a significant percentage in the variation of life satisfaction of individuals with self-perceived sex addiction. Our study revealed that experiencing more self-determined motivations, having a higher educational degree, being married and having an increased sexual desire predicts a higher life satisfaction for this specific population. This effect was consistent throughout the sample, regardless of the self-reported biological sex of participants. Theoretical aspects and practical implications for educational and mental health programs are discussed.

**Keywords:** self-perceived sex addiction, self-determination, life satisfaction, problematic online sexual activity, sexual desire

## Introduction

When addressing *sexual addiction*, the literature of the field uses different terms (e.g. problematic sexual behaviour, compulsive sexual behaviour, hypersexual disorder) to describe the main characteristics of this condition: sexual compulsivity, sexual impulsivity and behavioural addiction (PISTRE et al. 2023; KARILA et al. 2014). To this date, sexual addiction was not recognised by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) as a behavioural addiction, because of lack of peer-reviewed evidence to establish diagnostic criteria (American Psychiatric Association 2022). However, the International Classification of Diseases 11<sup>th</sup> Revision (ICD-11) has recently recognised the Compulsive Sexual Behaviour Disorder (CSBD) as an impulse control disorder. The condition was described as a persistent, repetitive engagement in sexual behaviours that results in impairment in one's life in addition to failed attempts to reduce or stop such behaviours (World Health Organization s. a.). The disorder showed significant clinical similarities with other behavioural addictions and substance use disorders concerning compulsivity, engaging in behaviours despite negative outcomes, craving and distress caused by the behaviour (KRAUS et al. 2016). Although the term "sexual addiction" has not been accepted, scientific studies are consistent on using this label for individuals experiencing compulsive, impulsive, addictive sexual disorder or hypersexuality as well as obsessive thoughts, behaviours or sexual fantasies (KARILA et al. 2014). The prevalence rate of sexual addiction-related disorders varies from 3% to 10% in the general adult population (BÓTHE et al. 2023; BÓTHE et al. 2020; BRIKEN et al. 2022). Regarding biological sex distribution, studies found that 3–10% of men and 2–7% of women might experience CSBD (BÓTHE et al. 2023), with men presenting higher sex addiction scores compared to women (SHIMONI et al. 2018; WÉRY-BILLIEUX 2017). Sexual addiction includes a wide array of problematic behaviours, including pornography use, cybersex, excessive masturbation, sexual behaviour with consenting adults, telephone sex, etc. (TÓTH-KIRÁLY et al. 2019; GRIFFITHS 2012; KARILA et al. 2014). Although problematic cybersex was considered a specific form of sexual addiction, Weinstein et al. (2015) reported that 65% of cybersex addicts have no history of sexual addiction. Due to the expansion of online sexual activities, problematic and addictive sexual behaviours have been extensively studied, with a large number of research using self-identified or self-perceived "sex addicts" (WÉRY-BILLIEUX 2017). The main demographics identified as

correlates for addictive sexual behaviour were biological sex, age, adverse childhood (KOTERA–RHODES 2019).

*Self-Determination Theory (SDT)* (DECI–RYAN 2000) posits that individuals have an inherent tendency to grow, and they engage in behaviours endorsing physical and mental well-being when their basic psychological needs for autonomy, competence and relatedness are socially supported (DECI–RYAN 2002). According to the Cognitive Evaluation Theory described within SDT, for individuals to reach a high level of intrinsic motivation, they need to feel competent (i.e. their activity leads to self-development and efficacy) and autonomous (i.e. their performance was self-determined and self-initiated) (DECI–RYAN 2000).

*Life satisfaction* was conceptualised as a cognitive evaluation of a person's life, using a set of personal criteria (SHIN–JOHNSON 1978; DIENER et al. 1985). It was considered an important motivational component of daily living activities and one of the most assessed indicators of a person's general well-being (DIENER et al. 2002). Recent studies concluded that basic psychological needs, motivation aspects (TANG et al. 2020) and well-being (HUANG 2022; RUGGERI et al. 2020) are among of the main correlates of life satisfaction.

Previous studies found that being more self-determined and having more autonomous and positive sexual motives can lead to higher levels of satisfaction with one's sexual functioning (GRAVEL et al. 2016), well-being and life in general (GRAVEL et al. 2019; TÓTH–KIRÁLY et al. 2019). In their early research regarding the relationship between self-determination and problematic sexual behaviour, Ingledew and Ferguson (2007) considered that autonomous motivation has a protective role in problematic and risky sexual behaviour. Later studies confirmed that self-determined motivations are connected to specific aspects of psychological well-being, suggesting that performing sex for autonomous reasons also relates to higher life satisfaction (BRUNELL–WEBSTER 2013; GRAVEL et al. 2019). More recently, Kotera and Rhodes (2019) explored the relationship between SDT and this specific condition. The researchers found that sex addiction was positively associated with external regulation (i.e. less autonomous, generated by external rewards) and amotivation, whereas internal regulation (i.e. more autonomous, generated by intrinsic motives) presented a negative association with the variable.

When analysing the relationships between *sexual function and life satisfaction*, research results reported a consistent link between constructs across age and biological sex (VASCONCELOS et al. 2023; BAHRAMI et al. 2023; ORNAT et al. 2013). However, demographic variables were found to influence the specifics of these relationships

(VASCONCELOS et al. 2023). For example, men with a low level of sexual desire reported lower levels of life satisfaction (JACKSON et al. 2019). In their study, Lu et al. (2020) concluded that men who had experienced more erectile and orgasmic complaints were less satisfied with their life, compared to participants with no complaints. Women's life satisfaction was found to be influenced by problems experienced in arousal and desire, a more elevated level of these components of problematic sexual functioning showed a tendency to decrease satisfaction with life (LEE et al. 2016). There is evidence that difficulties in sexual functioning (e.g. loss of sexual desire, erectile dysfunction, orgasm-related complaints) are also accompanied by higher levels of negative affect, regardless of the frequency in sexual activity (JACKSON et al. 2019).

Although numerous studies presented associations between self-determined and autonomous sexual motives, well-being (TÓTH-KIRÁLY et al. 2019; KOTERA-RHODES 2019) as well as sexual and life satisfaction (VASCONCELOS et al. 2023; BRUNELL-WEBSTER 2013; GRAVEL et al. 2019), there is a lack of research regarding the motivational and sexuality-related aspects of life satisfaction and the pathways leading to problematic behaviour in sex addiction.

*Our objective* was to contribute to the scientific literature regarding the life satisfaction of persons with sex addiction, and provide a more nuanced approach to the outcomes of sexual addiction and problematic online sexual activity. The present study targeted the motivational (self-determination theory), and sexuality predictors of life satisfaction in a sample with self-perceived sex addiction from Hungary and Romania.

## Measurements and methods

### *Participants*

The sample comprised  $N = 229$  adults from Hungary and Romania, belonging to the Hungarian ethnic group. Mean age of the participants was 26 (range 19–80). Distribution by biological sex was balanced, 90% declared themselves as having heterosexual orientation. In terms of education level (highest frequency of high school graduates, 32%) and marital status (highest frequency of divorced, 49%) the sample was heterogeneous. All participants declared themselves sex addicts. Descriptive statistics of the participants are presented in Table 1.

Table 1: *Sample characteristics and baseline measures for main study variables*

(N = 229)		
Age Min.–Max. (M ± SD)		19–80 (26 ± 10.09)
Biological sex	Female	105 (54.1%)
	Male	124 (45.9%)
Country	HU	204 (89.1%)
	RO	25 (10.9%)
Education level	Primary school	19 (8.3%)
	Vocational secondary school	17 (7.4%)
	Vocational high school	50 (21.8%)
	High school	73 (31.9%)
	College/Faculty	67 (29.3%)
	PhD degree	3 (1.3%)
Marital status	Single	68 (29.7%)
	Stable relationship/life partner	19 (8.3%)
	Married	29 (12.7%)
	Divorced/separated	112 (48.9%)
Sexual orientation	Widowed	1 (0.4%)
	Heterosexual	206 (90%)
	Other (e.g. bi-homosexual)	23 (10%)
Online Sexual Activity Scale OSAS Min.–Max. (M ± SD)		Risk of problematic online sexual activity 1–12 (2.88 ± 2.34)
Sexual Function Questionnaire SFQ18-HU Min.–Max. (M ± SD)	Arousal subscale	0–25 (16.42 ± 6.39)
	Desire subscale	5–20 (16.73 ± 2.86)
	Pain subscale	0–15 (13.05 ± 2.55)
	Enjoyment subscale	0–15 (9.93 ± 4.21)
	Orgasm subscale	0–15 (11.08 ± 3.35)
Self-Determination Scale SDS Min.–Max. (M ± SD)		Self-determination 17–49 (34.79 ± 5.98)
Satisfaction with Life Scale SWLS Min.–Max. (M ± SD)		Life satisfaction 5–35 (19.80 ± 6.65)

*Note:* Values represent frequency and percentage, unless indicated otherwise. M: mean, SD: standard deviation.

*Source:* Compiled by the authors.



### *Measurements*

#### Online Sexual Activity Scale (OSAS)

The Online Sexual Activity Scale (KOTTA et al. 2022) is a 12-item dichotomous scale designed to measure problematic cybersex activity in the general population. In line with the network approach of problematic online sexual activity, the scale also includes criteria for addiction and compulsive behaviour. The one-factor OSAS presented an adequate internal consistency, Cronbach's alpha was 0.74 (KOTTA et al. 2022).

#### The Satisfaction with Life Scale (SWLS)

The Satisfaction with Life Scale (SWLS) (DIENER et al. 1985) is an instrument developed to measure an individual's perceived global satisfaction with life. This instrument consists of 5 questions with a 7-point Likert type scale. A total score is calculated by adding up the scores for each item. The SWLS is shown to be a valid and reliable measure of life satisfaction, suited for use with a wide range of age groups and applications. The Hungarian version of the scale showed good reliability for both paper-based and online versions,  $\alpha \geq 0.84$  (MARTOS et al. 2014).

#### The Self-Determination Scale (SDS)

The Self-Determination Scale (SDS) (SHELDON et al. 1996; SHELDON–DECI 1996) was designed to assess individual differences in the extent to which people tend to function in a self-determined way. The SDS is a short, 10-item scale. Subjects are asked to determine which of two statements feels truer, using a scale ranging from “only A feels true” (1) to “only B feels true” (9). The items are organised into two 5-item subscales. The first subscale is awareness of self (self-contact), the second is perceived choice in one's actions (choicefulness). The subscales can either be used separately or they can be combined into an overall score. In this study, we worked with the global score, the self-determination index. Cronbach's alpha was computed for both scales and was found to be moderate:  $\alpha = 0.73$  for the personal control (choicefulness) scale and  $\alpha = 0.71$  for self-awareness (self-contact) (MARSCHALKÓ – KÁLCZA-JÁNOSI 2019).

### Sexual Function Questionnaire (SFQI8\_HU)

The Sexual Function Questionnaire (SFQI8\_HU) (KÁLCZA-JÁNOSI et al. 2022) consists of 18 questions, the answers are rated on a 5-point Likert scale. In the original scale higher scores indicate greater dysfunction; in this study, we reversed the scoring scheme, so that higher scores indicate better sexual functioning. The 5 domains of the 18-item SFQI8\_HU are: arousal; desire; painless sexual intercourse; enjoyment; orgasm. The 18-item SFQI8\_HU subscales showed good or moderate internal consistency: arousal subscale  $\alpha = .80$ , desire subscale  $\alpha = .83$ , pain subscale  $\alpha = .80$ , pleasure subscale  $\alpha = .72$ , orgasm subscale  $\alpha = .70$  (KÁLCZA-JÁNOSI et al. 2022).

### *Procedure*

Participants were recruited via convenience sampling on social networking platforms dedicated to pornography, sexual disorders and addiction. The study is in line with research ethical standards, ethical approval was obtained from the Babeş-Bolyai University (reference number 11.804 / 26.08.2020). Participants were given the opportunity to decide whether or not to take part in the study after reading a concise description of the study's nature, as well as the security and anonymity measures that the authors had committed to providing for the data and information provided by the participants. The estimated completion time for the questionnaires was a maximum of 15 minutes, with the option for participants to interrupt the process.

The sample was limited to those who met the inclusion criteria, which included self-reported sex addiction, with some degree of risk for problematic online sexual activity (1 point or more) measured by the Online Sexual Activity Scale (OSAS) and being at least 18 years old.

A correlational non-experimental research design was used in the study.

### *Data analysis*

To investigate the established relations, SPSS (Statistical Package for the Social Sciences) version 23.0 was performed. For statistically appropriate sample size calculation, a priori power analysis was performed using G\*Power3 (FAUL et al. 2007).

There were no variables with 5% or more missing values. In the regression models, categorical variables were introduced as dummy variables. Based on Tabachnick and Fidell's (2013) guidelines, data screening analyses were conducted to ensure no violation of the assumptions of normality of residuals, linearity, multicollinearity and homoscedasticity. The assumptions were tested, data fitted the regression model.

## Results

### *A priori power analysis*

A priori power analysis via G\*Power3 (FAUL et al. 2007) for multiple linear regression based on type I error with a p-value of 0.05 and statistical power of 0.80 with a total number of 14 tested predictors showed that for a medium effect size ( $f^2 = 0.15$ ) the required sample size is  $n = 135$ . Thus, our sample  $N = 229$  is suitable for detecting medium effect sizes.

### *Multiple linear regression analysis*

Descriptive statistics of the Self-Determination Scale, Sexual Disfunction Questionnaire subscales and Satisfaction with Life Scale are presented in Table 1.

To examine the predictive value of demographic, sexuality and sexual health related variables and self-determination, a multiple linear regression analysis was performed. The model was significant  $F(15,168) = 5.655$ ,  $p < .001$ , accounting for 33.6% in the variation of life satisfaction, with adj  $R^2 = .276$ . The total effect size of the regression Cohen's  $f^2 = 0.50$  was large.

Results suggest that education ( $\beta = 0.227$ ,  $p < .001$ ), marital status (being married) ( $\beta = .213$ ,  $p < .001$ ), self-determination ( $\beta = .390$ ,  $p < .001$ ) and sexual desire ( $\beta = .153$ ,  $p < .05$ ) have a unique statistically significant contribution to the model predicting life satisfaction. Higher education level, being married, high self-determination and increased sexual desire predict higher life satisfaction (Table 2).

Table 2: *Multiple regression with life satisfaction as dependent variable*

	<i>Model</i>		
	B	SEB	$\beta$
(Constant)	-1.501	4.106	
Age	-.111	.060	-.167
Education	.604	.180	.227**
Country_Hungary	.719	1.400	.034
Marital status_married	4.061	1.744	.213**
Marital status_widowed	-4.217	6.986	-.048
Marital status_separated/divorced	1.886	1.122	.145
Marital status_in stable relationship/life-partnered	.056	1.661	.003
Biological sex_Male	-.104	.961	-.008
Sexual orientation_Heterosexual	.138	1.464	.007
Self-Determination	.426	.080	.390**
Arousal	-.001	.116	.000
Desire	.401	.199	.157*
Pain	-.279	.190	-.104
Enjoyment	-.062	.177	-.030
Orgasm	.190	.163	.090
adjR <sup>2</sup>	.276**		
F <sub>(df)</sub>	5.655 <sub>(15,168)**</sub>		

*Note:* \*p < .05 \*\*p < .01; categorical variables were introduced in the model as dummy variables; dependent variable: Satisfaction with Life (SWLS).

*Source:* Compiled by the authors.

## Discussion and conclusion

As the rate of online sexual activities increases so does the interest of professionals researching the mechanisms and mental health aspects of risky and problematic sexual behaviour. The objective of our study was to identify the motivational, sexual and personal predictors of life satisfaction in individuals with self-perceived sex addiction, based on Self-Determination Theory (SDT).

Our study revealed that experiencing more *self-determined motivations* predicts a higher satisfaction with life for this specific population. This result is in line with previous outcomes on non-problematic population, where being more self-determined and having more autonomous and positive sexual motives led to elevated levels of well-being and higher life satisfaction in general (GRAVEL et al. 2019; TÓTH-KIRÁLY et al. 2019). Similar results were obtained in individuals reporting problematic internet use (i.e. unsatisfied basic psychological needs predicted lower life satisfaction) (OKUR-ÖZEKES 2020) and problematic pornography use (i.e. low levels of self-determination, lower life satisfaction) (TÓTH-KIRÁLY et al. 2019). Although there is a lack of evidence on the effects of SDT on self-perceived sexual addiction and satisfaction with life in this population, our current knowledge leads us to several conclusions. First, results suggest that self-determination is an important predictor of satisfaction with life in self-perceived sex addiction. Second, self-determination might influence problematic sexual behaviour through the mediation of life satisfaction (OKUR-ÖZEKES 2020). Third, the outcomes of cognitive evaluation on one's behaviour or life (e.g. satisfaction, beliefs, mindset, etc.) could affect addictive sexual behaviour also independently (PETER-VALKENBURG 2011; BÖTHE et al. 2017).

Regarding *demographic aspects*, higher educational level and being married predicted an elevated life satisfaction in individuals with self-perceived sex addiction. The condition was previously found to be associated with age, biological sex and certain personal antecedents (e.g. adverse childhood, living alone or with parents, etc.) (KOTERA-RHODES 2019; PRIVARA-BOB 2023). Symptoms of sexual addiction were also found to be mediated by gender and personality traits (SHIMONI et al. 2018). To our knowledge, to this date no research has addressed the role of education and marital status-related variables in predicting well-being or life satisfaction in sex addiction. However, studies assessing individuals with compulsive sexual behaviour or sexual addiction symptoms presented a prevalence of 47.1% to 62.4% for higher education (bachelor's and master's degree), respectively 14.2% for marriage (WEINSTEIN et al. 2015; WÉRY et al. 2016; BÖTHE et al. 2020) in their samples. Our results suggest that the main characteristics of sexual addiction do not alter the effect of education and marital status on life satisfaction. The association between higher education and life satisfaction in the general population has been previously documented (CHEUNG-CHAN 2009; SALINAS-JIMÉNEZ et al. 2011). The predictive role of education was partially explained by the relative position of one's educational level, specifically individuals are considered to show higher levels of life satisfaction as less people attain their educational level. However, the assessment tools used in these studies for measuring life satisfaction

ask for a cautious interpretation and generalisation of results, especially to our specific population. Regarding marriage, status was reported to lead to higher life satisfaction through the positive self-perception induced by more self-determined and autonomous motives for marriage (THOMPSON et al. 2022). Although this explanation has been supported in the general population, given the variety of motives for marriage, the hypothesis should be tested on individuals experiencing problematic sexual behaviour.

In our research, *sexual desire* was found to be the only sexual function-related variable which explained an important percentage of the variance in the model. This effect is in line with previous research results emphasising that sexual desire is a relevant predictor of sexual satisfaction and life satisfaction in both women and men (VASCONCELOS et al. 2023; LEE et al. 2016; JACKSON et al. 2019; LU et al. 2020).

In conclusion, our results suggest that the life satisfaction of individuals with self-perceived sexual addiction is predicted by their self-determined motives, the evaluation of their relative educational position, the degree of self-determination and autonomous motives regarding marital status, and to a lesser degree by their level of sexual desire. Although we would have expected sexual function to play a more important role in the life satisfaction of sexual addicts, it seems that self-determined and autonomous motives play a more important role in influencing their satisfaction both directly and indirectly. Based on these findings we advocate for educational and mental health programs which consider self-determined and autonomous motivations. Creating mental health programs which promote and support self-determination, the sense of autonomy, competence and relatedness would help individuals to manifest and endorse behaviours sustaining their mental and physical health.

### Limitations and future research

Our main limitation is the lack of a clinical sample, which would have provided us useful information about the role of self-determination in the life satisfaction of individuals diagnosed with compulsive sexual behaviour disorder or other sexuality related disorders. Participants were sampled from the general population and assessed on a self-report basis. Because of the nosological dispute regarding sexual addiction and the lack of a clinical sample, we were not able to address this shortcoming in the present research. However, future studies could examine the underlying mechanisms of self-determination in samples of individuals diagnosed with sexual disorders related to addictive sexual behaviour (e.g. CSBD, etc.). Furthermore, a conceptual differentiation

between sexual addiction, cybersex addiction and problematic pornography use should be considered. Although “sexual addiction” is used as an umbrella concept which also includes cybersex addiction and problematic pornography use (KARILA et al. 2014), the literature of the field reveals inconsistent results when concept definitions and assessment instruments overlap (WEINSTEIN et al. 2015). Future research should explore the role of covariates mediating the relationship between education, marital status and life satisfaction of individuals experiencing problematic sexual behaviour within and outside the SDT framework.

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Gediminas Bučiūnas

# The Use of Psychological Coercion Instruments by Police Officers in Domestic Violence Incidents

## Abstract

The main topic of this research paper is the use of psychological coercion instruments by police first response teams in domestic violence incidents. The research on the usage of voice as one of the instruments of psychological coercion in police officers' daily activity in coping with domestic violence incidents is a novelty in the Baltic countries. The aims of this research paper are:

- to present an environment of operations by police officers during the performance of their duties to protect, defend and assist
- to present voice as an important instrument of psychological coercion used by police officers as a soft power tool before resorting to the use of physical coercion instruments prescribed by law
- to analyse the use of elements of the human voice in domestic violence cases
- to present ways to improve police officers' performance who are dealing with domestic violence as a first response team through the proper use of voice as an instrument of soft power

The author of this research paper used research methods to achieve the aims of the research, such as observation, anonymous verbal interviews of participants and discussions with them during specialised training sessions on entrance into premises, analysis of statistical data, surveys, analytical research and logical analysis to explore the topic.

**Keywords:** aggressive environment, domestic violence, police officer, psychological coercion

*"If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer defeat. If you know neither the enemy nor yourself, you will succumb in every battle"*  
(SUN Tzu s. a. Chapter 3: 18).

## Introduction

Police officers, firefighters and emergency medical workers are identified to have a relatively high risk of being confronted with violence at work in many countries (GATES et al. 2006; RABE-HEMP – SCHUCK 2007). The above-mentioned categories of public servants are in charge of providing social services and conducting duties assigned to them by law. They are frequently confronted with different human beings in various circumstances. For example, from providing first aid to chasing down law offenders mostly outside the workplace at different times of the day. This can be at night or during the day.

Police officers also experience stress when going to unknown places. This is evidenced by the results of a survey conducted by the author of this paper in the context of research on stress management. The research is still ongoing. The target audience of this survey were 176 police officers from the first response teams of the National Police of Ukraine in the region and the Patrol Police. The questionnaire was created by the author of this research paper in compliance with ethical and data protection standards prescribed by law. The author reserves the anonymity of the respondents to the survey. The author of this paper also conducted interviews with three heads of units of police first response teams on stress management issues at the police, including questions related to the sources of the stress for police officers. The majority of respondents (more than 90%) answered the questions, such as: What usually causes you stress at the workplace? They replied – law offenders. This has also been proven by the results of another research done by Lisa van Reemst and Tamar F. C. Fischer from the Kingdom of the Netherlands, and based on data from a workplace violence survey of the Ministry of the Interior and Kingdom Relations of the Netherlands, police officers are at high risk, facing violent behaviour, action outside their workplace (VAN REEMST – FISCHER 2019).

## Police handling of violence

Violence involves mainly two forms: physical and psychological. The different forms of violence mentioned above vary in their nature and essence, from simple verbal assaults to attacks against police officers performing their duties using offensive words, phrases and signs, to the use of physical violence aimed at injuring or even killing police officers with lethal tools such as knives or small arms.

According to data from the FBI's Law Enforcement Officers Killed and Assaulted (hereinafter referred to as "LEOKA") database, 503 officers nationwide were feloniously killed between 2011 and 2020. The author of this paper is going to focus on domestic violence. During the above-mentioned period, 43 officers were feloniously killed while responding to domestic disturbance or domestic violence calls. According to the FBI, 14 officers were feloniously killed when they encountered a domestic incident after arriving at the scene. The 43 officers who were killed while responding to domestic disturbance or domestic violence calls account for roughly 8.5% of the total number of officers killed between 2011 and 2020.

According to John Shane, Professor at the Criminal Justice department at John Jay College of Criminal Justice and based on results of interviews and surveys with police first response team members during the training sessions done by the authors of this paper, several factors may be identified which make a domestic violence incident highly dangerous for the safety of police first response team members.

Firstly, police officers enter into a human being's private space, and they are bringing a public face to a very private matter as potential participants of incidents in many cases are considered. Second, conflict parties' emotions overrun minds. Third, one of the conflicting parties is convinced that police officers are going to use the coercive powers granted by law. It fuels more emotions in human beings' behaviour and makes people angry to see the police, especially knowing that there is a real risk of being arrested or even being in the future incarcerated for breaches of the law. At the same time, it increases the likelihood that police officers will be attacked in hostile territory by a potential perpetrator. This leads to many questions. For example, how to counteract an upcoming threat for police first response team members with the minimum damages? How to protect human beings' lives and health? How to secure the personal safety of police officers?

### **Coercive measures**

There are different forms of coercive measures to address the risks and threats to the personal safety of police officers in the performance of their duties under the law. For example, part 1 of Article 27, Conditions for the Use of Coercive Measures by the Police of the Republic of Lithuania states: “An officer shall have the right to use coercion only in cases of clear necessity and only to the extent necessary for the performance of his official duties. The use of coercion by an officer shall be appropriate to the circumstances and proportionate to the danger involved, considering the specific situation, the nature and intensity of the offence, and the individual characteristics of the offender. Physical coercion shall only be used when psychological coercion has been ineffective or when any delay endangers the life or health of the official or another person.”

Part 2 of Article 30 on Types of Police Measures of Law of Ukraine on the National Police states: “For the purpose of protecting human rights and freedoms, preventing and combating threats to public order and civil security, the Police shall also apply, within the scope of its competence, preventive police measures and coercive measures contemplated in this Law.”

Provisions as mentioned above for using coercive measures exist in the laws on police activity in other countries. Two forms of coercion are in place and assigned for the police to use: physical and psychological (in some academic research, laws use the term “mental”).

So, this leads to the conclusion that police officers have to choose which form of coercion is going to be used to cope with the challenges during the performance of assigned duties. The author would like to underline that in this paper the term “instrument” is used instead of the term “measure”.

### **Psychological coercion during domestic violence**

The author of this paper is going to analyse psychological coercion during domestic violence by police first response teams.

According to the Encyclopedia Britannica, coercion is “the threat or use of punitive measures against states, groups, or individuals in order to force them to undertake or desist from specified actions”. According to the “Dictionary of the Conflictologist” compiled by A. Y. Antsupov and A. I. Shipilov the term “coercion” is defined as

a tactical technique in a conflict, accompanied by the threat of sanctions, violence, or blackmail in order to force the opponent to take certain actions (or go to concessions).

According to the American Psychological Association dictionary, the term “psychological coercion” is defined as the process of attempting to influence another person through the use of threats, punishment, force, direct pressure and other negative forms of power.

According to the contract database and resource centre “Law Insider”, mental coercion means “a warning of the intention to use physical coercion, special means, a firearm, or explosives. Warning shots shall be held equal to mental coercion.” Psychological coercion is an intentional pattern of behaviour (often used alongside other forms of abuse) that can include threats, excessive regulation, intimidation, humiliation and forced isolation. It is designed to punish, dominate, exploit, exhaust, create fear and confusion, and increase dependency. It strips a person of their identity and breaks down the very core of who they are.

Analysis of the term “psychological coercion” or also the widespread usage of another form of the term “mental coercion” by using different research methods (linguistic, analysis, synthesis) allows us to conclude that psychological or mental coercion is a process of purposeful influence on a natural person’s consciousness and subconscious, aimed at correcting or changing the natural person’s behaviour, at fulfilling wishes to comply with the law, ethical requirements or to obey orders or instructions for the benefit of someone. Psychological coercion also includes the element of warning about negative consequences that are going to affect a natural person directly if he/she does not obey instructions given by another natural person. This can happen in different situations even if natural persons are not bound by subordination. For example, a robber orders a potential victim to hand over jewellery, or police officers give commands to stop the use of impolite words in public places. If you do not obey given commands, negative consequences might come soon. For example, a robber may use physical coercion to achieve a goal. As we can see, the influence on a natural person’s behaviour comes from the outside. It includes the high probability of using physical coercion measures in case of refusing to change the behaviour of a person desirably for another person or society. There is no space for freedom in a human being’s mind to make decisions about how to act in a given situation: to follow the robber’s orders or not do what you are told. There is a high probability that physical coercion is going to be applied right now.

The next question might be raised in this paper. How do we connect two parties with opposite positions, approach towards someone or something? One part of the conflict is the sender who has requested or been ordered to do something.



Another part of the conflict is the receiver, who must obey some procedures, instructions and directions. The answer is communication. It is a bridge for connecting the opposite parts of a conflict or relationship.

According to John Locke, “communication is inherently problematic because it is never perfect, and the transmitted ideas never properly coincide in the minds of the sender and receiver” (LOCKE 2000). Obviously, the uniqueness of each person during the communication process can lead to problems of interpretation, meaning, or understanding, but dealing with certain behaviour types, such as conflicted individuals, makes communication even more difficult. This is especially relevant in the activities of police officers because many of them communicate with various individuals on a daily basis. So, there is a need to identify which communication methods of police officers are effective when communicating with individuals with different types of behaviour (DOBRŽINSKIENĖ–PALAITYTĖ 2023).

Police officers often have to communicate with different types of human beings. Interacting with a conflict-type person makes them feel uncomfortable, as they may be aggressive, have no control over their emotions, and may be under the influence of alcoholic beverages or narcotic or psychotropic substances, which only makes the situation worse. The word aggression connotes active action and is associated with destruction, violence and mutilation. People express their feelings directly, sometimes even using physical violence (PRUSKUS 2012). Timas Petraitis (2010), who analysed the peculiarities of verbal communication between police officers and various individuals, noted that officers lack professionalism, restraint and tact when communicating.

The above-mentioned conclusions also have been confirmed by the results of observations on the communication skills of police officers done by the author of this paper during the conduction of the practical part of 9 training sessions on domestic violence for 176 police officers from the first response teams of the National Police of Ukraine in the region and the Patrol Police of Ukraine in 2022–2023. Premises for the conduction of improved scenarios were used: specially designed in the territory of regional national police training centres, the University of the Ministry of Internal Affairs in Lviv city, and other places. The scenarios for the practical part were prepared by the author of this paper and were subject to change during each training session, depending on the level of preparedness of the main part of the participants. The main idea during the preparation stage of training was to adopt practical scenarios closer to real-life situations. Also, the authors of prepared scenarios left enough space and freedom for actors to improvise within the frame of the scenario. The most valuable gem during this type of training, namely, during practical exercises, is the selection

of the actor-players who perform different assigned scenario roles with the use of weapon replicas, fake grenade toys, stiletto knives, empty bottles of champagne, improvised explosive devices, booby traps, etc. Scenarios varied from the peaceful, calm environments to the most dangerous actions. Actors were selected to perform the roles of offender, victim, bystander, offender's or victim's family members and friends. Police officers in teams of two had to conduct assigned duties during practical scenarios closer to real-life situations of domestic violence cases. The focus of the practical exercises was the ability of police officers to communicate with different types of human beings in an aggressive environment and to use different tools and tactics for communication. For example, the first response team arrived at the domestic violence incident spot and met two males walking inside the private fenced territory, around them running two German shepherds without a leash. Some police officers started to use such directions at the beginning of communication: "Your dogs are off leash"; "You will be fined". Although police officers did not even try to set up contact with male actors, they did not try to identify who was the real owner of the dogs running around. Instead of doing it, police officers started to threaten them with negative consequences. What kind of message was sent? How did it help to set up contacts? Did it help to reduce tension? Answers – no, it just increased. The author of this paper is going to analyse one instrument that is used for persuasion, psychological coercion and physical coercion – voice.

### **Voice – An instrument of psychological coercion**

In the above-mentioned situations, police officers have a choice to use different ways to set up contact with a potential abuser and other parts of the conflict. Firstly, persuasion has to be used. According to the Encyclopedia Britannica, persuasion entails getting another party to follow a particular course of action or behaviour by appealing to the party's reason and interests without being threatened by negative consequences. For example, the above-mentioned situation with the running dogs. Police officers, after saying "good day", should be creative in the given situation. For example, one may start chatting about dogs' coats. This simple proposal may help to identify the dog's owner and set up contact with him/her, and at the same time, it significantly reduces the risk of being attacked by a dog. Another example of the use of persuasion. A police officer tries to persuade a potential abuser to stop cursing in public places by influencing a human being's beliefs, attitudes and behaviour through arguments

aired by voice and body language. If the above-mentioned instrument – persuasion did not have any impact on the behaviour of the conflict parties, especially on the offender, and did not change his/her point of view regarding something. It is time to use psychological coercion. Both persuasion and psychological coercion are the main tools of soft power in the police's daily routine. The author of this paper is going to analyse one instrument that is used for persuasion, psychological coercion and physical coercion – voice. This leads to the conclusion that persuasion has to be employed first during police officers' performance of assigned duties.

Most police officers demonstrated good communication skills in the above-given situation through polite behaviour and a desire to overcome obstacles to communication in a peaceful and friendly manner. Firstly, police officers try to persuade the other side of the conflict and incident through meticulously selected words. Police officers did not use any words related to negative consequences for the people at the beginning of the contact. It was the act of influencing the minds of those involved directly in parties with conflict through arguments offered by police officers in a friendly way. It includes the will of human beings to act in a good way, to change their attitude toward the police officer's instructions, and to start steadily cooperating. It helped to reduce the level of tension between police officers and two males walking with dogs, allowing set-up contact between them. The above-given example shows the importance of communication style, creative approach to the issue, and properly chosen instruments for transmission of messages, such as voice and posture to the opposite side, to persuade them to cooperate. Police officers have enough instruments at their disposal to persuade conflict parties to change their attitudes and behaviour. For example, a police officer's voice, posture, appearance and equipment.

The author of this paper analysed police officers' algorithm of actions in different real-life situations related to domestic violence and the content of verbal instructions transmitted to the potential abuser by an instrument of psychological coercion – voice. The scenario of the practical exercise was the following. Police officers received a phone call from an actress performing the role of a victim of domestic violence. When they entered premises, a potential abuser was sitting in the kitchen and cutting a salted flitch of bacon with a knife. Observation of practical exercises and interviews with the participants of the training reveals two different scenarios depending on the nature of the algorithm of actions. One – immediately stop cutting the salted flitch of bacon with a knife. Other algorithms of action were performed in such a way. Police officers said hello to the participants of the conflict when entering the premises, and patiently waited until the potential abuser finished cutting the fat and only then did the officers

issue the verbal instructions. In each situation, it facilitates decreasing the level of tension, especially if a potential abuser is under the influence of alcohol, and it also allows officers to set up contact with a potential abuser, or the abuser's supporters.

Another aim of the above-mentioned exercise was to analyse how a potential abuser understands the content of instruction issued by a police officer. Is it clear instruction for him/her or not? What words were used to build the core of the instruction? An abuser-actor was instructed by the author of this paper to fulfil instructions given by the police first response team's member in the way he/she had been understood. Police officers entered the house. A potential abuser was sitting in the kitchen and cutting a salted flitch of bacon with a knife. After issuing an instruction to a potential abuser by a police officer: "Put down the knife", the follow-up action was that the person put down the knife on a desk or floor. However, a different outcome followed when the police officer issued a different verbal instruction to the offender. "Throw the knife." It allows for the abuser to choose a different model of behaviour during the performance of such instructions: throwing a knife on the floor or throwing a knife toward the police officer. The verbal instruction was not clear.

So, correct and clear, short, easy to understand and perform instructions, and skilful use of vocal elements such as volume, tempo, pauses, articulation, tone of voice and intonation play an important role in reducing tension during domestic violence cases. The importance of the use of voice as a psychological coercion element is also supported by the survey results done by the author. Target audience – 18 police first response team officers (9 male and 9 female) from the National Police of Ukraine in the region, located in the western part of Ukraine. The questionnaire was created by the author of this research paper in compliance with ethical and data protection standards prescribed by law. The author reserves the anonymity of the respondents to the survey. The goal of the survey is to determine how the physical appearance of police officers and the usage of appropriate words to express the instructions/commands influence the offender and other persons present at the scene of the conflict. To the question: Does the physical appearance of a police officer (height, body composition) impact the offender or other participants of the conflict? 9 respondents answered: Yes, it has a crucial impact on the behaviour of participants involved in conflict, mainly on the offender. 5 partly agreed and 4 slightly agreed with the idea expressed in the question. Another question was: Does the use of proper wordings to express instructions affect the behaviour of an offender, also other participants of a conflict? 9 respondents answered: Yes, it has a crucial impact on the behaviour of participants involved in the conflict, mainly on the offender. 2 respondents partly agreed and

7 slightly agreed. The following question inquired: Was it necessary for the police officer to add the additional word “please” to the instruction? For example: “Put down the knife, please.” 15 respondents answered yes. It is a polite way to communicate with every natural person, including an offender. 2 answered that the offender could accept this as a police officer’s weakness, and there is no need to use the word “please”. One respondent answered that a police officer does not need to use polite words at all. It is just an instruction issued by a police officer. The Police Act gives the police the right to issue a verbal instruction, which the addressee must comply with.

## Conclusions

1. Police officers have a relatively high risk of being attacked at domestic violence spots.
2. Persuasion and psychological coercion are the main tools of soft power in the police’s daily routine.
3. Police officers have enough psychological coercion instruments at their disposal to persuade the conflict parties to change their attitudes and behaviour such as voice, posture, appearance and equipment.
4. Based on the behaviour of the conflicting parties, a sequence of measures is recommended for police officers acting in an aggressive environment, using first persuasion, psychological coercion, and then the last measure – physical coercion.

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Monika Saganová

## The Analysis of Spiritual Factors of the Safety Culture

### Abstract

The article focuses on the analysis of the spiritual factors of the safety culture, which are extremely important in maintaining the overall organisational culture. We consider organisational culture to be a success tool for the organisation and a tool for achieving set goals. One of the essential values of organisational culture is safety, safety culture and its artefacts, values and factors that characterise it. Several factors, whether spiritual, material or organisational influence the provision of a good safety culture. The article analyses the spiritual factors in more detail at the individual level, the cooperative level and the state level.

**Keywords:** corporate culture, safety culture, spiritual factors

### Introduction

Even an animal in danger reacts completely differently than when it is out of danger. This is also the case with individuals, employees of the organisation, the entire organisation itself or the state. If employees do not feel comfortable, they are worried about their health while performing work, they are not sure about the sustainability of their job or financial remuneration, their work performance will be at a low level. When an individual, a resident of a given country feels threatened in his country and his security is compromised, he often acts recklessly and endangers the security of others. We can perceive safety as the highest value in the life of individuals, society and the state.



In order to ensure a good safety culture, there are several factors, whether spiritual, material or organisational. We will focus more closely on the analysis of spiritual factors.

## Safety culture

In order to be able to analyse the individual factors of safety culture, we first define what safety culture means. Safety culture consists of two words – *safety and culture*.

*Culture* represents the sum of the creations of human activity, both material and spiritual, intellectual, which is accumulated, preserved and enriched throughout human history and passed on from generation to generation (HOFREITER–BREZINA 2023).

*Safety* is the state of a social, natural, technical, technological system or other system that, under specific internal and external conditions, enables the fulfilment of specified functions and their development in the interest of man and society (HORÁČEK 2006). In general, it can also be characterised as a state without a real threat of danger, or a state opposite to danger (BUZÁSSYOVÁ–JAROŠOVÁ 2006).

Culture and security (individual customs, religions and values) have been influencing each other since the beginning of humanity itself. The main aspect of mutual interaction lay in the pursuit of cultural dominance exercised by one nation over another. Here the religious differences arise, that often result in wars or conflicts. The mutual interaction of culture and security is often realised through power, capable of creating and enforcing cultural values and patterns, but also through the defence (protection) of created and accepted cultural values. There are many definitions of safety culture in the professional literature. Kirschtein in his publication “How is it possible to improve the quality of work safety and ensure the constant growth of the safety culture in the company?” defines safety culture as a system of values, traditions, characteristics, approaches and attitudes of the organisation as well as individuals, which considers the safety issues of the organisation as the highest priority and for which the adequate attention must be taken considering their importance across the entire organisation (KIRCHNER–SPERLING 2024).

Cieślarczyk (2011) defines safety culture as a way of thinking about safety, perceiving safety and determining safety values (CIEŚLARCZYK 2011).

According to Pidgeon, the security culture determines the system of meanings, thanks to which the subjects are able to realise and understand the threat and therefore they can take an attitude towards risk, threat, security and they are also able to assign adequate values to them (PIDGEON 1998).

The first official definition of safety culture was given in the document Safety Series No. 75, INSAG-4, issued by the IAEA in 1991 after the Chernobyl disaster: “Safety culture is a set of organizational and individual characteristics and attitudes that establishes the deserved attention to the questions regarding the safety of nuclear power plants as the highest priority.” This definition can be transferred and generalised to any reference object (individual, religious group, state, nation, etc.).

Safety culture combines the correct setting of the safety management system and its implementation in practice – the safe behaviour of individuals and their involvement in safety, as well as the perception of safety as an important value of the entire company.

Consistency between what is declared in the guidelines and how the regulations are implemented in practice is of key importance. Safety culture is not something that can be bought or acquired. Safety culture is a combination of the effects of organisational culture, professional culture and it is often heavily influenced by national culture. It can be positive, negative or even neutral.

Taking into consideration the wide spectrum of definitions in professional literature, we can define safety culture as “a system of values, traditions, characteristics, approaches and attitudes of reference objects that consider safety issues as the highest priority, and to which, due to their importance, they pay adequate and permanent attention” (HOFREITER 2023).

### Factors of safety culture

Safety culture is influenced by several factors. In general, it is the cooperation of a person, with the help of various technical and technological means to work and behave in order to ensure safety. In doing so, customary organisational measures and procedures of the company are observed. Therefore, the safety culture is influenced by *spiritual* (behaviour of people), *material* (means to ensure safety) and *organisational factors* (usual procedures, solutions and measures).

#### *Material factors of safety culture*

Material factors may be considered to be a set of financial, technical, technological and other material resources that create suitable conditions to ensure the implementation of the accepted and applied safety culture.

### *Organisational factors of safety culture*

It consists of rules and structures for the implementation of safety culture, as well as structures supporting management and implementation institutions. It is primarily about the creation of intelligence structures, ensuring the collection and providing of information about agents, effects and events in the strategic environment of the state. The creation of a functional internal information system is a necessary condition for the functioning of the structures of the state's security system (HOFREITER 2023).

### *Spiritual factors of safety culture*

Security culture also deals with how people negatively or positively influence the functioning of society (state), thereby contributing or not contributing to overall security. The *human factor* is about understanding the ways people interact with the world, their capabilities and limitations, and about influencing human activity to improve the way people do their jobs. People themselves play a very important role in achieving the required level of safety and safety culture. They are an integral part of safety management, that is essential for the overall understanding, identification and reduction of risks, as well as for the optimisation of human behaviour within a safety culture (HOFREITER 2023).

### **Analysis of spiritual factors**

Spiritual factors are an important part of safety culture, they influence the perception and attitudes of individuals, organisations and the entire culture of society or the state.

We can consider spiritual factors at three levels of analysis:

- *individual level* (focusing on the perception of safety/uncertainty)
- *corporate* (enterprise) *level*
- *state level* (with a focus on ensuring security as a function of the state) (HOFREITER 2015a)

As we mentioned above, the basic spiritual factor is *human potential* at all three levels and its capabilities and competences for identification, analysis, evaluation and prediction of the development of factors affecting security.

### *Analysis of spiritual factors at the individual level*

Spiritual factors at the individual level can be expressed by the synthesis of life values, knowledge, abilities of individuals necessary to ensure safety in scientific or professional activity, in ordinary everyday social and private life. It also includes the behaviour of the individual and his preservation of the safety of other people, respect for the legal order, approach to environmental protection, respect for traditional values in society, etc.

Among the spiritual factors at the individual level we can include:

- human value system
- acquirement of safety standards, norms and principles of safe behaviour
- knowledge, abilities, skills and habits of a person conditioning his safe behaviour
- sense of responsibility, human motivation, understanding of the need and necessity of taking care of one's own safety

A *human value system* includes values, beliefs and ethical standards. These factors influence how people perceive right and wrong values and how they behave in accordance with these values. In the nineties of the 20<sup>th</sup> century, interest in promoting positive values grew. This was mainly due to the fact that in the Japanese companies the positive influence of human values and correct beliefs in the general results of the company was proven. When examining these organisations, the sincere effort of all employees to treat colleagues and clients decently, honestly and fairly was identified. At the same time, the organisations had an evident and clear intention to provide high quality work, products or services (KŘIVOHLAVÝ 1995). Human values such as empathic thinking or compassion strengthen the ability to relate to the situation of others. These qualities are important for cooperation, solidarity and willingness to help in various crisis situations.

*Acquirement of safety standards*, norms and principles of safe behaviour can help ensure safety and protection against various hazards. Compliance with these standards can help reduce the risk of injury and illness of individuals related to their work, as well

as to improve the general working environment. Compliance with safety standards can also help improve productivity and quality of work, as employees will feel safer and have more confidence that their work is safe and healthy. Therefore, it is extremely important to observe the principles of safety behaviour of individuals.

*Knowledge, abilities, skills of a person conditioning his safe behaviour* and acquirement of the right work habits is one of the basic steps in maintaining safety at work. Correct work habits include, for example, correct lifting of heavy objects, correct use of tools and machines, or correct use of personal protective equipment. All this ensures that individuals are protected and that there are no unwanted accidents or threats to the health of employees.

A strong spiritual side of an individual can even strengthen the *sense of responsibility* towards oneself, society and others. As a general rule, people who have a strong sense of responsibility adhere more strictly to safety measures and are able to help others, better manage stress and uncertainty. They know how to motivate people around them for better performance and are an example for them in taking care of their own safety.

### *Analysis of spiritual factors at the cooperative–business level*

Spiritual factors at the cooperative–business level can be characterised as a set of rules and functions of the organisation, the purpose of which is to ensure the safety of the enterprise, to ensure its activities and protection of the interests as well as to ensure the safety and health of the employees.

Among the spiritual factors at the cooperative–business level we may include (IAEA-TECDOC-1329 2010):

- functional safety education system
- recognition of the high priority of safety as a presupposition for the duration and development of a company, organisation
- compliance with regulations and procedures in all sectors and areas of security in the company (organisation)
- the attitude of the top management towards safety
- continuous checking and measurement of the state of complex security in the organisation

An important spiritual factor at the corporate level of safety culture is *a functional safety education system*, which will ensure the integrity of the unity of needs, knowledge, abilities and skills necessary to avert dangerous situations and safety threats. As a result, all employees know the company's (organisation's) security policy, the rules of safe behaviour, they have familiarised with them and follow them.

Safety education of employees is essential for the productive use of human potential in the creation of a safety culture. It makes it possible to acquire capabilities and competences for hazard identification, predicting the development of a situation affecting safety and subsequent elimination of an unfavourable situation. That is why it is important to constantly train and educate the staff, familiarise them with the current situation, with possible risks and threats, but also with modern solutions of problems and of threatening unfavourable situations. Such building of security awareness is an important security measure that contributes to achieving a high level of security culture.

With sufficiently functioning security education, the active participation of individuals in risk identification, risk valuation, applicability and sustainability valuation is subsequently possible in order to prevent the security breaches. Not only employees at the operational level but also those at the strategic or tactical level should be involved in the identification of hazards. Adoption or consideration of proposed measures and provided feedback to employees leads to a feeling of participation in building the overall safety culture of the company.

The recognition of *the high priority of safety and the subsequent implementation of safety* in all spheres of the company's activity is the right presupposition for the good development and maintenance of the company. This creates a precondition for the protection of the human factor, property and other assets of the company. It contributes to a higher quality of life in the company and to a higher efficiency of the company itself (GAŠPIERIK–REITŠPÍS 2006).

In the end, this creates a good image, know-how and goodwill of the company on the market. It is necessary to realise that security is expensive. It is never 100%, it is never finished, and it is primarily the task of the top management. The principle is that only approximately 15% of problems should be left to be solved by employees and the rest, that is approximately 85% of problems, should be handled by the management system (HOFREITER–BREZINA 2023). To ensure the permanent prosperity of the company, it is important that a management mechanism is in place to ensure the optimal functioning of the company (BARTEK–RUSKO 2014). No company or organisation is interested in

the existence of temporary or permanent threats, not even in the emergence of a crisis, that only leads to material, informational, financial or human losses.

It is necessary to keep in mind that *the attitude of top management towards safety* is always reflected in the behaviour of employees. If the top management does not respect the rules, it can be difficult to demand the fulfilment of the rules from other employees. Top management is a necessary condition for the success of the company. Strong and visible leadership and actively involved managers at all levels can set the direction and basic principles of a preventative approach. This will ensure the strategic position of safety and health protection in the company. In practice, this means that the management establishes safety and health protection at work as one of the company's core values and informs all employees about it. The managers have an accurate idea of the risk profile of the company they manage and they set an example for others by following all occupational health and safety rules at all times.

*Continuous checking and measurement of the state of complex security* in the organisation is the basis of preventing risks and imminent unwanted changes. A review of existing and new restrictions must be carried out periodically and any changes must be identified. It should also be noted that the limitation may change with time, with geographical and social developments as well as with the company's work culture. Preventing risks means anticipating them and with the lowest possible costs for this purpose, it is necessary to create financial resources so that the effective risk prevention can be implemented. It is necessary to control those situations and conditions whose risks are eliminated, minimised or transferred to another place and thereby optimised. It is also about predicting the consequences of these risks and optimising them so that the damage to health and property is as small as possible.

Thanks to the continuous checking and measurement of the state of safety, preventive actions can be implemented in time to prevent the occurrence of improper actions, malfunctions, accidents and other unwanted events (BARTEK–RUSKO 2016).

### *Analysis of spiritual factors at the state level*

There are areas in which ensuring security is beyond the power of the individual. It is not possible to defend individually against armed aggression, prevent the spread of weapons of mass destruction or influence the economic and environmental problems of the world. Therefore, the individual voluntarily shifts the protection of his interests to a higher organisational structure – the state. It has internal and external sovereignty

and ensures the safety of its citizens by means of its security forces. Internal sovereignty allows the state to exercise jurisdiction within the state entity, while external sovereignty guarantees the state the equal status in the system of international relations and that no other state has the right to interfere in its internal affairs (KAČMÁR 2016).

The culture of security at the state level expresses its attitude and relationship to security as such state of society in which everyone's security is secured at the required level. It expresses how political representation reacts to possible threats to the security of the state and citizens, how it creates conditions for the development of social units. It also shows how the state cares about educating citizens about safety, about safe behaviour in various situations (RAK-MATOUŠKOVÁ 2004).

The culture of security as a result of fulfilling the function of the state in the area of security is also influenced by spiritual factors.

Among the spiritual factors at the state level we may include:

- the system of social values (religion) and priorities in the field of security
- the approach of political representation to the security needs of the state and citizens
- promoting the culture of safety in the mass media
- organisation of population training in the field of prevention and enforcement of patterns of safe behaviour and response to dangerous situations

*The system of social values*, where religion also plays an important role, has a great influence on people's behaviour and, consequently, on the entire security system of the state. Uneven economic development, especially in the Near and Middle East, creates conditions for the abuse of faith and traditions, the rise of religious fanaticism, the emergence of authoritarian regimes and, consequently, illegal migration. These differences often lead to feelings of threat and attacks on civil liberties, economic and cultural development or their significant limitation. Since the Slovak Republic is not an isolated state, we do not live in a vacuum and we are part of a Western democracy through which we profess certain values. It is necessary to protect these values in order to preserve the customary standard. Therefore, the threats to which we are exposed are not small. Their scope often threatens not only one state, but the entire region or continent. Therefore, it is important to take preventive steps in the social field, in education and in the formation of public opinion aimed at the tolerant coexistence of different ethnic and religious groups in society.

It is important that spiritual factors are continuously integrated into the overall safety culture, thus achieving a balanced and sustainable safety.



*The approach of the political representation to the needs of the security of the state and citizens*, the accepted and adopted principles of the culture of security are reflected in the content and trend of the culture of the given state, expressing mainly the approach of the political representation of the state to ensure its external security. Factors that influence the security culture at the state level have ideological, religious and cultural values. Historical experience, narrative history, but also military capabilities and the definition of the hierarchy of the state's protected interests shape and build a security culture.

*Promoting the culture of safety in the mass media* is an effective tool that, by means of modern technologies, spreads information in a given time and space and informs the largest possible audience. Only an educated and well-informed population can react relevantly to security threats or dangerous situations. One of the tasks of the state is *the organisation of population training in the field of prevention and enforcement of patterns of safe behaviour*.

### Strengthening of spiritual factors

Strengthening of spiritual factors can contribute to the increase of the overall safety culture and improve perceptions and attitudes at all three levels of safety culture – at the level of individuals, organisations and society (state).

In order to achieve the strengthening of spiritual factors, it is necessary that *the values and ethical standards of society* are clearly established, they should be shared and supported throughout the organisation, society or state. Employees (individuals) should know what is expected from them and what are the company's (state's) priorities.

Another tool for strengthening spiritual factors is the often mentioned *education*. Employers should not only provide their employees with lifelong learning in their field, but also enlightenment regarding the spiritual aspects of safety, which can be implemented through various workshops, lectures or discussions on values, responsibility and company culture.

It is also important to support community activities and the cooperation of individual groups. Voluntary activities, charity projects and joint efforts of individuals can strengthen the sense of security and fellowship and thereby fulfil the individual steps of the safety culture (RAK-MATOUŠKOVÁ 2004).

Creating a positive work environment where employees feel supported and respected creates a space for overall spiritual well-being and a positive safety culture of the

organisation. The same applies at the state level, for the population – creating a safe environment within the given state creates a space for an overall feeling of security.

It is important that individuals, organisations and the state recognise the spiritual dimension and integrate it into their strategies and programs for the overall improvement of the security culture.

## Conclusion

By introducing and maintaining the safety culture, it is possible to influence not only the material pillar of safety (the safety system and its elements), but also the human factor and the spiritual pillar of the safety culture manifested in the safety awareness of individuals.

Timeless thinking in safety issues can be considered one of the presuppositions for a good safety culture, when an active approach to safety can ensure a state, in which the company will always be at least one step ahead. It is important to realise that not only high-ranking officials are responsible for safety, but also every individual in the company.

We can understand the spiritual factors of safety culture as a set of characteristics and attitudes of reference objects based on the priority of safety as a condition for their development and survival. These are individual and group values, attitudes and different behaviour models, aimed at achieving safety.

A safety culture is a reflection of the values that are adopted and applied at all levels of the organisation, and which are based on a belief in the importance of safety and the responsibility of everyone to promote and achieve it. It creates a framework for formulating the interests and needs of reference objects in the field of security, and it is a source for the formation of security awareness at the level of the individual, company or state (HOFREITER 2015b).

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Andrea Barta – Tünde Póka

# The Measurement of Metacognitive Processes in Psychology Research – A Review

## Abstract

21<sup>st</sup> century skills, like self-regulation, metacognition, communication, collaboration, digital and critical thinking skills become increasingly relevant in every life domain. Metacognitive processes contribute to the adequate planning and execution of activities, time-management, adaptive emotion regulation. In this review several online and offline measurement methods are demonstrated, highlighting the advantages, strengths and disadvantages, weaknesses of the most often used instruments for the assessment of metacognition, namely of the self-reported questionnaires. One of the most frequently applied offline self-reported instruments for the study of metacognition is the Metacognitive Awareness Inventory developed by Schraw and Dennison in 1994. The inventory measures five metacognitive regulation skill: planning, information management strategies, comprehension monitoring, debugging strategies, evaluation and three types of metacognitive knowledge: declarative, procedural and conditional knowledge. However, the results regarding the factorial structure, subcomponents and item structure of the inventory are very contradictory. Some possible explanations of these contradictory results are also discussed.

**Keywords:** metacognition, assessment, metacognitive knowledge, metacognitive regulation, Metacognitive Awareness Inventory

## Introduction

Metacognition, as a form of self-regulation, is one of the most researched higher-order cognitive abilities of the 21<sup>st</sup> century. Metacognitive processes involve not only understanding our cognitive processes and activities but also regulating them for adaptive problem-solving and successful adaptation in all areas of life.

Metacognitive processes are investigated within numerous psychological areas (NORMAN et al. 2019). Research in the field of educational psychology highlighted the role of metacognition and its development in learning and achievement. Experimental psychologists, investigating the effect of metacognitive judgements on different cognitive activities, confirmed the relationships between metacognition and other higher order cognitive processes, like problem solving, critical thinking. In clinical psychology the role of metacognition in mental health and its modification opportunities are examined. Research regarding developmental psychology studies the progress of metacognition and its application in different situations at different periods of life. Personality and social psychology studies focus on the recognition and control of mental processes that could affect attitudes and interpersonal relationships. The aim of cognitive neuropsychology research is the identification of the brain regions responsible for metacognitive activities (NORMAN et al. 2019).

The measurement of metacognition is difficult because it cannot be defined as an explicit behaviour, nor as a fully implicit process, because we are aware of our metacognitive processes to a certain degree. Metacognitive processes could not be observed in a direct manner. It is a complex mental process that contains metacognitive knowledge and regulation, but also includes momentary motivational and emotional aspects that could affect the control of cognitive processes (LAI 2011).

For the measurement of metacognition researchers apply extensively self-report questionnaires, inventories (ALTINDAĞ–SENEMOĞLU 2013; ÇETINKAYA–ERKTİN 2002; O'NEIL–ABEDI 1996; PEDONE et al. 2017; SCHRAW–DENNISON 1994; SPERLING et al. 2002; YILDIZ et al. 2009), interviews (BOSCH et al. 2021; PELLECCCHIA et al. 2015; SEMERARI et al. 2012), performance ratings (FILEVICH et al. 2020; PENNINGTON et al. 2021), systematic observations (DE BACKER et al. 2021; ESCOLANO–PÉREZ et al. 2019; LAI 2011; OZTURK 2017), and think-aloud strategies (JORDANO–TOURON 2018; SCHELLINGS–BROEKKAMP 2011; SCHELLINGS et al. 2013). The application of think-aloud strategies is very time-consuming because of the individual observation and evaluation (AKTURK–SAHIN 2011).

### **Online and offline methods for the measurement of metacognition**

For the measurement of metacognition online and offline instruments are distinguished. The online tools measure metacognition during the solution of a task or during learning, such as think-aloud protocols, when the participant needs to think aloud and phrase the strategies applied for task solution. Another online measurement is judgement regarding the actual performance, which is compared with the real performance, for the measurement of metacognitive accuracy. Offline tools do not measure metacognition during the execution of the task or during the learning situation, but before or after the accomplishment of the exercise. During metacognitive interviews participants are asked about the metacognitive strategies applied earlier. Similarly, in case of questionnaires the individual needs to judge and decide whether different aspects of metacognition were present or not, or to what degree were they present during the execution of the task, or how they were manifested in general. There is no significant relationship between the results of online and offline measurements of metacognition, thus the results are influenced by the instrument applied for the measurement of metacognition (CRAIG et al. 2020; SCHELLINGS et al. 2013).

Another controversial question is the timing of the instrument for the measurement of metacognition. The offline measurement of metacognition with questionnaires or interviews before the execution of the task implies several biases, like response bias for example. During the measurement of metacognition after the completion of the task, the participant has the opportunity to retrospect and analyse the knowledge and skills applied in the current task. However, the online measurements of metacognition, that are more reliable than offline measurements, are not appropriate for the measurement of all metacognitive processes, for example the evaluation of the achievement or problem-solving process is possible only after task completion (CRAIG et al. 2020).

### **Self-report questionnaires for the measurement of metacognition**

For the measurement of metacognition several questionnaires were developed. The advantages of self-report questionnaires include their simple application on huge samples, time effectiveness, cost effectiveness of the data processing, the possibility of quick and objective evaluation of the results (AKTURK-SAHIN 2011; ROTH et al. 2016;

SCHELLINGS – VAN HOUT-WOLTERS 2011; SCHELLINGS et al. 2013). Besides these advantages there are also several disadvantages. Many questionnaires examine general learning strategies, participants need to judge how they learn in general, independently of the context or the task. The answers to the items are affected by the participants' memory functions because they need to recall from their long-term memory the mental processes and activities applied by them during learning. Therefore, the questionnaires measure not concretely the applied metacognitive strategies, but the judgements or memories of the participants about the activated metacognitive processes in general learning or exercising situations. Similarly, the working memory and verbal skills of participants could also affect the responses (AKTURK–SAHIN 2011; ARAKA et al. 2020; LAI 2011; SCHELLINGS – VAN HOUT-WOLTERS 2011; SCHELLINGS et al. 2013).

During the application of self-report questionnaires response bias could appear, participants could overestimate their abilities (AKTURK–SAHIN 2011; ARAKA et al. 2020; CRAIG et al. 2020; SCHELLINGS – VAN HOUT-WOLTERS 2011), the answers might be influenced by the comparison of their abilities to others, they do not want to seem to have weaker or different abilities than others, or they might respond to the questions based on the expectations of the researcher (CRAIG et al. 2020). During the completion of self-report questionnaires regarding the general learning situation, participants could think about different task types, the context effect appears, thus the generalisability of the results is questionable (LAI 2011; ROTH et al. 2016; SCHELLINGS – VAN HOUT-WOLTERS 2011; SCHELLINGS et al. 2013). The items of the questionnaire could also be interpreted differently, it can happen that not everybody understands the questions entirely (AKTURK–SAHIN 2011). It is not clear whether the respondents mark or evaluate as more characteristic of them the strategies that they consider useful, or the strategies applied by them in practice. There can be a difference between the statements of participants and their actual observed behaviour. The validity of the questionnaires could also be affected by the participants' ability to analyse the learning situation, to identify metacognitive knowledge and the applied strategies (ROTH et al. 2016).

### **The Metacognitive Awareness Inventory (MAI)**

The Metacognitive Awareness Inventory (SCHRAW–DENNISON 1994) is an extensively applied instrument for the measurement of metacognition. The instrument was developed to measure metacognitive knowledge (three components: declarative, conditional and procedural knowledge) and metacognitive regulation (planning,

information management strategies, comprehension monitoring, debugging strategies, evaluation) indicators.

As result of unrestricted exploratory factor analysis (EFA), in the first validation study of Schraw and Dennison (1994) was found a six-factor structure, but these factors were uninterpretable from a theoretical point of view. It was concluded that the MAI does not measure the subcomponents of metacognition that were initially hypothesised, thus the presence of the two factors (metacognitive knowledge and regulation) was tested with restricted factor analysis. The aim of their second validation study was testing the validity of MAI, examining students' metacognitive knowledge, regulation and achievement with empirical methods. Metacognitive knowledge was tested with the judgement regarding the monitoring achievement before filling in the test, then participants completed four text comprehension tests. Metacognitive regulation was measured with the participants' confidence indicator in case of every text comprehension question, participants rated their own level of confidence in the correctness of their answer from 0 to 100%. For the investigation of the predictive validity of the instrument, first the researchers tested the two-factor structure that they had also investigated in the first study, then the MAI scores were compared to the previous judgements regarding the monitoring performance, to the text comprehension achievement and to the monitoring accuracy. Monitoring accuracy was calculated as the difference between the confidence in the correctness of the answers and the actual performance on the text comprehension tests. Similarly to the first study, only the two-factor structure of the MAI was confirmed in this study. Both studies found a significant relationship between metacognitive knowledge and metacognitive regulation factors. As a result of the second study, metacognitive knowledge was significantly associated to the judgement regarding the monitoring performance. Previous judgements were positively associated with the achievement, students having more confidence in their monitoring ability also achieved better results at the text comprehension test. Similarly, there was a significant positive relationship between MAI scores and text comprehension performance. However, no significant correlation was found between monitoring accuracy and MAI scores, nor between monitoring accuracy and monitoring judgements (SCHRAW-DENNISON 1994).

In 2016 Ning tested the factorial structure of the instrument separately on students achieving low scores, and on students achieving high scores at the MAI. In case of students with low metacognitive awareness scores only a one-factor structure was revealed, but in case of students with high metacognitive awareness scores the



two-factor structure was confirmed. The results of this study suggest that the level of metacognitive abilities could affect the factorial structure of the instrument (NING 2016).

The results regarding the subfactors of the two main factors show a high variety among the studies testing the factorial structure of the inventory. In case of MAI, the different studies identified 3, 4, 5, 6 and 8 subcomponents. The eight-factor structure of MAI proposed by Schraw and Dennison was confirmed only on its Persian (POURGHANIZADEH 2017) and Turkish (AKIN et al. 2007) versions. Among the eight factors three belonged to the metacognitive knowledge and five to the metacognitive regulation factor. Therefore, these studies also confirm the two-factor structure.

One possible explanation for the variety of the results is the low level of metacognitive abilities of the participants that results in a less complex factorial structure (NING 2016). Another possible explanation is that the age of the participants involved in the studies investigating the factorial structure of MAI moves on a wide range, primary school students cannot put into practice their metacognitive knowledge, respectively they cannot absolutely identify the strategies applied during learning, they have lower metacognitive awareness than secondary school students. Craig and his colleagues (2020), based on 20 included studies in their meta-analysis, concluded that the relationship between metacognitive knowledge and metacognitive regulation increases as the participants' age increases.

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Kund Regényi

# Psychological Characteristics of Rising Generations and the Relationship between HUMINT

## Abstract

Today's security challenges have intensified the need for reliable and verifiable information, which the national security services along with police organisations traditionally satisfy from human sources. This brought with it the so-called renaissance of HUMINT. At the same time, however, the psychological characteristics of the younger generations, as well as the developing trends of mobile telecommunications and social media, have also generated challenges and brought new contradictions to the surface. This paper presents some of these – of course the most obvious ones, such as time management, sharing location and images, re-evaluating personal meetings – and formulates some suggestions for dealing with the challenges (e.g. avoiding generational gaps among sources and handling personnel) also emphasising the importance of the training of human sources.

**Keywords:** HUMINT, younger generations, psychology, challenges, solutions

## Introduction

The present article examines the relationship between one of the oldest branches of clandestine intelligence, the secret information from human sources, and the rising generations, points out some contradictions and makes a proposal to resolve them. The paper focuses on the highest level of clandestine intelligence from human sources, the handling of secret sources. Under secret source we mean the special cooperation

when a natural person undertakes to act secretly in the long term in the interest of the organisation under the direction of a national security service or law enforcement agency, primarily, but not exclusively, for the purpose of obtaining information.

The first part of the study presents some relevant characteristics of secret source handling. The second part covers the well-observable behavioural characteristics of the younger generations, which are in contrast to the established good practice of secret source handling. After that, the third part formulates suggestions for resolving these contradictions.

### **Certain important features of secret source handling**

Secret sources are used by both the defensive and offensive branches of intelligence, i.e. foreign intelligence and domestic counter intelligence (SCHOLTENS 2023; KÁROLY et al. 2019; BODA et al. 2014). Foreign intelligence employs a smaller but higher-quality, higher-level secret source contingent suitable for obtaining better protected information, while domestic counterintelligence seeks to involve a relatively larger number of secret sources. The individual secret sources form a specific network under the control of the service. The creation of a secret relationship is a structured process, the phases of which are regulated by the internal standards of the given national security service or law enforcement agency, which meet the requirements of legality and rely heavily on the results of psychology.

In the course of secret cooperation, personal meetings are regularly held between the secret source and the employee of the national security or law enforcement agency, i.e. the source running officer, during which the secret source reports on the execution of the previous task, and the running officer specifies the details of the report and determines further tasks to perform for the secret cooperation. A real and accurate appearance at the meeting is a moment of critical importance. In an ideal case, the meetings are planned in advance without special consultation, since every consultation or postponement increases the risk of an unauthorised third party becoming aware of the meeting. In addition to face-to-face meetings, impersonal contact is also possible and necessary, which nowadays takes place mainly in the virtual space, using information technologies, i.e. it has an internet footprint.

The next prominent characteristic of secret cooperation is, obviously, secrecy itself. The fact of maintaining contact, actual cooperation with a national security or law enforcement agency, any formal or substantive element thereof, or any related knowledge

must not be shared with third parties under any circumstances. The cooperating parties consciously do everything to ensure that this knowledge, or the moments referring to it, remain secret. In particular, the secret cooperation and the identity of the involved source, as well as any related data, such as the name, identity photo, address, etc. of the running officer, can be classified as secret.

The secret source can perform the tasks of the secret relationship only with above-average interpersonal skills. In other words, it is essential that his/her communication skills, including persuasive communication skills, are outstanding. He/she must be able to quickly reinvent himself in a new environment, he/she must be able to establish a deep acquaintance with new people relatively quickly and win their trust. Naturally, the running officer must also have these skills as well.

Last but not least among the qualities expected of a secret source is good memory. The secret source can be expected to accurately remember images, numbers, longer texts written or spoken on a topic unknown to the secret source and even in a foreign language, names and faces over a longer period of time, even years later, without any aids or targeted learning.

### **General impressions about rising generations**

At the outset, we consider it important to state that differences and disputes between generations are by no means new. Furthermore, possible differences, existing skills in certain areas or their absence do not and cannot in any way represent a value judgment. However, in order to effectively collect secret information, it is absolutely necessary to name them in order to eliminate possible difficulties and to find solutions (MYERS-SADAGHIANI 2010; BANNON et al. 2011).

In anticipation of the above, it can be said that the importance of pre-arranged meetings is greatly reduced for the younger generations. In their private lives, the rising generations are constantly shaping their planned programs, the time and place of pre-arranged meetings. In doing so, of course, as in other areas of life, they heavily rely on the tools and possibilities of mobile telecommunications. In this way, of course, they also increase their internet footprint, which is not desirable for intelligence and counterintelligence services. If the meeting takes place, delays are the order of the day, which is again detrimental to the secrecy of the meetings.

For the younger generations, the culture of sharing is natural and can even be said to be part of their existence. Members of the young generation reflexively share the



important events of their lives and the people involved in them immediately on the world wide web, on various social media platforms that change according to fashion. Another important feature is that the sharing is carried out preferably with a picture or by using and publishing the geolocation data of the mobile telecommunications device.

What you didn't share didn't happen, and it can't result in positive feedback and "likes", the importance of which is outstanding for the younger generations. Sharing geolocation data with a parent, sibling, or friend is a sign of trust, the failure to do so raises questions. It is a real nightmare for a Generation X running officer that the location of the source meeting, or perhaps the person or photo of the running officer, is shared on social media. Is it possible that in the future this will become inevitable and part of everyday life?

In many cases, the younger generations have grown up in small families, in long-lasting and excessive parental anxiety, without peer groups or relegated to a virtual space. It follows that for them the physical proximity of other people and groups and direct communication with them is a challenge and stress. The phenomenon of voluntary withdrawal from society is becoming more and more common. Of course, these trends were also enhanced by the 2020–2021 Covid-19 pandemic. It is surprising, but it is at the same time a fact that the younger generations prefer to get their information from internet interfaces than from conversations between people. Communication skills and the ability to make easy connections therefore seem to be significantly reduced.

The memory of the younger generations also works differently than usual. The key combinations and system commands required to operate the computer can be memorised with childlike ease, while the previously mentioned texts, images and data cannot, or only barely. It is obvious that various easily searchable databases, such as Wikipedia, and the increasingly effective artificial intelligence-based internet search engines play a key role in this phenomenon. This is not a problem in everyday life, but it is a serious challenge to recall the content of a meeting or document where taking photographs – which is another shocking habit – is not possible. It is clear that if taking photos becomes a generally accepted habit, and it seems that we are moving in this direction, the criticality of the situation mentioned above will also decrease significantly. However, the really important conversations and texts will probably still belong to this narrow but all the more important circle.

## Challenges and opportunities

It is easy to see that the situation outlined above is quite contradictory. In the last part, we look for the answer to whether it is possible to resolve the contradictions, and if so, how.

The first point is that what is lacking in the skillset of secret sources must be present to a greater extent in the toolbox of running officers. Here, we mainly focus on interpersonal skills, easy, yet precise and convincing oral communication. Staying with the person of the running officer, I think it is important and desirable that the running officer and secret sources belong to the same generation, or at least the generation gap should be as small as possible. This is somewhat contradicted by the following idea, according to which it is important that the running officer fulfils his role with appropriate training and accumulated experience in other national security fields. Of course, these processes are time- and cost-consuming. Returning to the person of the secret source, his/her training is also enhanced.

It is likely that the proportion of face-to-face meetings will decrease in the future, and in parallel, exchanges of ideas conducted on telecommunication and infocommunication interfaces will become more frequent. Which will lead to an increase in the already mentioned internet footprint. Taking into account that the internet does not forget, in addition to technical solutions, it is important that conditions and forms of behaviour suitable for concealing the reality are applied as widely and in a better developed manner as possible. It can be expected that simple secrecy will be replaced by cover-up, or in a related technical term, the application of legend.

In summary, it can be said that the resolution of the contradictions seems to be possible by raising the quality and standard of secret cooperation, partly by technicising it, and by involving the younger generations. Since their investment requirements are also greater, it is expected that HUMINT will be a tool for acquiring qualitative knowledge instead of quantitative, it is expected that the quantitative network will be replaced by the qualitative network domestically as well, and with this, counterintelligence services will also, at least in relation to some specialist areas, act as specific internal intelligence services.

We can therefore be confident that we are not witnessing the disappearance of HUMINT, but its survival and transformation at a higher level, even becoming more secret.

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Arlinda Muharemi

## The Role of Intelligence Services against Terrorism

### Abstract

I have chosen the topic of the role of secret services against terrorism as a multidimensional phenomenon to include terrorism, criminal behaviour, prevention and resilience. In order for the intelligence services to successfully accomplish their role in their fight against terrorism, they should carry out the following activities: infiltration discovery of the action plans of the terrorist group, convey the collected information to intelligence services. The study approach will take into consideration special instruments against terrorism, armed forces against terrorism as well as international cooperation against terrorism. We will also rely on the analyses made on terrorist warnings and threat assessments.

**Keywords:** terrorism, intelligence services, national strategies, armed forces, international cooperation

### Introduction

Terrorism as a phenomenon, for intelligence services, is complex and chaotic. Groups of conspirators form scenarios, they do not discuss their plans with anyone and are cautious when buying or obtaining supplies, so they do not arouse suspicion. They live normally, so the question is: how to uncover their plot? The goal of intelligence services is not only to apprehend terrorists but also anyone who could potentially carry out a terrorist attack in the future. The best point of counterintelligence focus is

the individual terrorist scenario. Some of the most important limitations in gathering information about terrorism are inherent in the tool and the way terrorists operate. The anti-terrorist role that intelligence services should play is to uncover terrorist conspiracies so that they can be prevented or planned intentions can be appropriately protected from the terrorists' aims.

Undoubtedly, intelligence services should do everything in their power to increase the likelihood of gathering information about these plots. The greatest contribution of intelligence services to the fight against terrorism is gathering information about individual terrorists, terrorist leaders, cells and groups. The information gathered can be very specific. Terrorists are very cautious in carrying out their attacks, but they do not live and operate under complete protection because they have identities, meet, move and communicate. With such sufficient facts, potential terrorists can be arrested, infiltrated, pursued, or criminally prosecuted. Cells can be dismantled, and their members can be left to be questioned, which can be presented to any organisation.

To successfully fulfil its role in the fight against terrorism, intelligence services should carry out the following activities:

- Phase 1: Infiltration – penetration of the intelligence service (either detective or collaborator of the service) into the structure of the specific terrorist group.
- Phase 2: Discovery of terrorist action plans, identification of members (terrorist group), identification of the identity of state apparatus members who are terrorist collaborators–assistants.
- Phase 3: Transmission of information collected by intelligence services, further analysis and distribution to relevant state authorities.

Counterintelligence, as part of intelligence services, supports other counterterrorism instruments in many ways, much more than warning and assessing the terrorist threat. Dealing with the nature and activities of extremist groups provides the basis, for example, for decisions on foreign terrorist organisations. It also contributes to the activities of state sponsors of terrorism. It supports diplomacy, not only by informing official bodies that certain decisions should be made and convincing other governments to cooperate in the fight against terrorism but also by preparing materials that can be distributed to other governments.

Analysis of counterintelligence for terrorism is an analysis from any source. They can be human and technical resources and everything that is publicly available. Data collection function is the heart of tactical-level analytical work performed by

Table 1: *Spectrum of terrorist warnings and threat assessment*

	<i>Threat information flows</i>	<i>The specifics of the plot</i>	<i>Tactics</i>	<i>Strategy</i>	<i>Main strategy</i>	<i>Education</i>
<i>Information specifics</i>	Location	The correct address	Some cities	Country or region	Regions	Across the world
	Time	The exact date	Days and weeks	Weeks and months	Months and years	Years and decades
	Purpose	Uncover the plot Dislocation of the location	Short-term measures, beware of the perpetrator	Raising the level of care with vital security measures	Some categories of interests	Legislation Large national programs
<i>Against possible measures</i>		Uncover the plot Dislocation of the location	Short-term measures, beware of the perpetrator	Raising the level of care with vital security measures	New permanent physical measures and procedures	Legislation Large national programs

Source: CRONIN-LUDES 2004.

counterintelligence agencies through various purposes for verification and other information techniques (Table 1).

It should also be emphasised the work of counterintelligence agencies in terms of informing the policy maker about the scope of threats, the development of threats, the relative security of any model, indications that one is more desirable than another, and the implication of national interests for each of the possibilities. Unfortunately, it must be emphasised that in a world where counterintelligence information will always succeed in predicting terrorist attacks, they will never become a reality because in such a world, there will be no terrorism.

### Special instruments against terrorism

The international strategy to combat terrorism also implies the involvement of a series of non-military instruments aimed at preventing and combating terrorism, a fight that involves the implementation of various psychological and political instruments.

In this context, state and non-state organisations can take a range of psychological and political activities that relate to neutral or friendly sides, but also to hostile ones.

The main goal of psycho-political activity is considered to be the projection of strategic influence. According to American sources, the fight against terrorism has some similarities with the early years of the Cold War when the ideological dimensions of the East–West conflict were highlighted. Then, the United States established specialised tools for implementing activities during the Cold War. These tools include the American intelligence agency, the military and psychological operations, secret propaganda and the White House Psychological Strategy Board. Psycho-political activities are linked to the functioning of public affairs on the one hand and military activities or humanitarian operations on the other, which are undertaken as a form of psychological and political effect. Political psychological activities can be grouped into three categories: diplomacy, counterintelligence operations and secret political activities. Public diplomacy aims to involve a range of government programs from general areas of external communication, education, cultural exchange and public policy actions. The term “political action” encompasses activities designed to influence political groups and processes in the world. In most cases, psychological operations are lightweight, straightforward and highly tactical, for example, encouraging surrender or warning civilian populations to evacuate the region to be attacked. On the other hand, with a greater strategic effect, they become tactically sensitive and tend to attract the attention of high-level government officials. At the border between psychological operations and public diplomacy lies a gray area, which over time complicates the institutional use of these actions. At the strategic level, most psychological operations can be strictly distinguished from what might be called public diplomacy.

### **Military forces against terrorism**

Before we elaborate in detail, it is interesting to see that theorists wonder whether terrorism is a type of war. Experts believe that if terrorism is defined as the exacerbation of fear through violence or abuse to achieve political goals, it follows that terrorism should create force where it is lacking or strengthen it where it is small. Through publicity created by expressive violence, terrorists seek to preserve the influence that will affect political changes at the local or international level. American Admiral J. C. Vail points out that in many cases, terrorists use a cumulative approach where

sequences or parts of activities are not important. What is important is the cumulative effect – a general approach to the range of attacks and individual shocks. The fight against terrorism demonstrates a discontinuity in the use of military force in response to terrorism. There is now greater openness to the use of military force based on the right to self-defence against terrorism. Terrorist forces, in most cases, fight at a tactical level on difficult terrain without paying much attention to civilian casualties, thus neutralising military priorities for precision weapons for war, masses and military manoeuvres. There is an exception to the use of military force in terrorist centres, as many of these centres are either in other states or in neutral states, thus undermining the political dimension of military intervention. A particular obstacle to the use of military force against strong terrorist organisations is their lack of centralisation, as in many cases they are more organised as a network rather than a hierarchy.

As a result, such terrorist organisations are relatively resistant to military operations, so fixed networks and centres of gravity are attacked in most cases by non-military organisations. Military forces can provide military support to strengthen legal operations against terrorism. The army may be asked to cooperate with military counterintelligence services.

The involvement of military forces in the fight against terrorism also raises the issue of applying the laws of war in counterterrorism operations, because:

- Not all terrorist activities or all counterterrorism combat operations (even when they have an international dimension) contribute to the military conflict between states. The terrorist movements themselves often have a non-state character.
- Counterterrorism operations may mean forms of action against forces operating on the territory or border actions against the state supporting terrorist acts.
- In many cases, the attributes and activities of the terrorist movement must not be in the hands of bodies related to international armed conflict law.
- Since terrorist forces often have little respect for international rules, the decision to use counterterrorism forces to implement them may weaken these forces with expectations of reciprocity.
- The fundamental principle of the laws of war is that attacks should be directed directly against enemy forces, not civilians. This principle, which is violated by terrorist attacks, can be seriously applied in counterterrorism operations, as terrorist movements do not consist of defined military forces that clearly distance themselves from civilians. Some prisoners who are members of terrorist organisations do not meet the status provided for in the Third Geneva Convention.



## International cooperation against terrorism

Terrorist acts can be committed on the territory of one state or conducted against foreign nationals or opponents in the state. When terrorism is carried out outside the borders of one state or carried out against the economic, political, or cultural interests of a foreign state, it is considered international terrorism. Nations suffering from terrorism join the global anti-terrorist coalition because they preserve not only interstate but also regional and international interests. This defines the need for genuine interstate cooperation. Interstate cooperation gains weight because terrorist organisations do not recognise borders and spread their activities in the form of networks throughout the territory of many states. In this way, they become less vulnerable and less recognisable. Not coincidentally, in United Nations documents and European documents, an important place is devoted to bilateral and multilateral cooperation among states, which is realised:

- in the form of exchange of information between the police and intelligence services (their information)
- in the form of harmonising plans in the fight against terrorist acts
- in the form of ongoing cooperation in detecting a specific terrorist act
- in the form of harmonising laws and other legal acts

International cooperation in the fight against terrorism has intensified, especially after the end of the Cold War, including cooperation between Russian and American, Russian and British, Russian and Israeli intelligence services. Bilateral cooperation is also marked between countries such as Italy and France, Italy and Germany, the USA and Saudi Arabia, the U.K. and the Czech Republic, the U.K. and Slovakia. Since the 1990s, there has been an important initiative for multilateral cooperation among states. The importance of Interpol in the fight against terrorism should be emphasised, as it provides assistance to the police in various countries within legal frameworks and in the spirit of the Universal Declaration of Human Rights, establishing and developing all institutions that will effectively contribute to the prevention and fight against common crimes. Until 1994, Interpol did not include politically motivated terrorism in its scope. Since 1995, Interpol has begun to act on terrorist incidents that have occurred in various parts of Europe. In addition to Interpol, at the proposal of the former German Chancellor, Europe is envisaged as a secret police agency based in The Hague, where liaison officers from certain European countries exchange information and coordinate activities related to relevant issues. Europe can exchange information but cannot conduct investigations. An important form of multilateral cooperation is also international meetings, agreements

and conventions of an international nature. Only in 1996, in six different countries around the world, six international meetings on terrorism were held as key issues. It can be said that when it comes to international cooperation against terrorism, it is at a high and successful level, but there are also some factors that hinder this cooperation, such as the lack of special laws in some countries, little experience in some Western democracies, the reluctance to sacrifice or jeopardise commercial opportunities, fear of retaliatory actions, and different standards related to the concept of terrorist acts and their perpetrators.

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Tatjana Gerginova

## The Concept of Security and Hybrid Threats

### Abstract

In theoretical terms, there is no single definition of the concept of security. The concept of security is shaped by values, threats, challenges and risks that appear in different forms and are defined in different contexts. Hence, we can talk about national security, social security, health security, society security, occupational security, traffic security, etc. Modern globalisation has caused an increase in security threats and risks. This process continuously produces a series of economic and social inequalities for most of the world's population, but also various forms of geopolitical competition, exploitation of countries and discrimination of people. Within the framework of the paper, the author will define the term "Concept of Security" and analyse the terms "asymmetric threats", "hybrid threats" and "building resistance". In the final part of the paper, the author states the following conclusions: Globalisation is the driver and creator of new modified risks; therefore, it is difficult to draw a line of separation between threats and security risks. Modern modified risks are not selective – on the contrary, they affect all countries and social classes and have global consequences. The new types of threats are multiplied and transnational and require a wide range of instruments to deal with them. The content will be created based on the analysis of foreign literature and using electronic content. In preparing the content of the paper, the author will apply the general scientific methods: the descriptive method, normative method, comparative method and content analysis method as a special scientific method.

**Keywords:** concept of security, asymmetric threats, hybrid threats, building resilience

## Introduction

Security is essentially a changing category and therefore its understanding is determined by many different factors, such as: new security threats and risks, new security actors, new security responses, new security needs and interests and changing dynamics in international relations.

The modern world faces the following threats: traditional (military) and modern (non-military) threats that must be prevented and defended collectively, by applying a mutual set of traditional and new approaches and methods. Modern threats are multiplied and transnational and require a wide range of instruments to deal with them. They are not selective – on the contrary, they affect all countries and social classes and have global consequences.

It follows from this that the concept of security has an evolutionary character and is therefore subject to continuous change and development in the context of the specifics of the security environment. In this regard, the importance of non-military security threats and risks is a specific feature of contemporary security understanding. As a result, concepts such as environmental security, food security, energy security, etc. appear on the security agenda.

## Security in the modern world

In the 21<sup>st</sup> century, security is facing a deep transformation, the emphasis is shifting from threats to risks and this leads to a different perception of security. The complexity arises from the fact that modern risks differ in many aspects from the past, they are unpredictable and it is difficult to determine their causes, origins and the effects they can cause.

As a result of this, authors appear in the scientific literature according to which the concept of global security is closely related to the concept of a global risk society. According to these authors, risks come without warning, have their own temporal manifestation (do not wait), have no specific timing or location.

These concepts contribute to a more extensive consideration of the security aspects that are related to the new circumstances resulting from the modified risks, which can easily lead to global chaos and disorder.

In the scientific literature, there is agreement that safety is a variable category that is determined by many factors and processes. As a result, security perceptions and concepts are defined in different contexts.

If analysed from the aspect of political, scientific-technological and socio-economic problems, the acquisition of security in the modern world is a complex endeavour (GERGINOVA 2023).

With that in mind, security is a complicated, multi factorial and hierarchical phenomenon. Its analysis and understanding should also have an interdisciplinary character. This is because of the changing nature of security.

The basis of security consists in arranging conditions for existence, survival in the present time and advancement in the future. Ensuring this condition implies the ability of social entities to eliminate the threats that have been defined. In situations of asymmetric security, threats are not always clearly defined. They often consist of their own system structures, in the relations and status of the subjects of international relations. The imbalance, the mismatch have political, military, economic, legal, social and societal dimensions, which further exacerbate the complexity of today's security environment.

As a result, new security concepts are emerging, such as environmental security, economic security, energy security, societal security, critical infrastructure security, social security, health security, society security, occupational security, traffic security, cybersecurity, etc. These new security concepts initiate increased attention in security research and the security agenda, while the reasons for them are mainly related to the increased frequency of non-traditional threats and risks.

### **The term asymmetric threats**

According to certain authors, asymmetry is an integral part of the history of society and warfare, that is, asymmetric issues have a history as long as humanity (METZ-JOHNSON 2001).

Asymmetric warfare and its conceptual basis are particularly visible in the writings of Sun Tzu, while the basic concept of asymmetric warfare is a model by which the technologically and numerically weaker opponent enables inflicting losses on the opposite side, presenting results in order to promote its views and goals, and by striving to motivate new like-minded people.

A broader consideration of the nature of asymmetric threats implies the development and application of security threat methods that are different from the assumed concepts or tactics and doctrine applied by the adversary.

Asymmetry in defence and security can be traced through the pronounced disproportion in the development and possession of military technology, as there are

many examples in the history of warfare during the 20<sup>th</sup> century. Also, asymmetry can be monitored from the point of view of disproportionately expressed fighting will, population support and fighting morale of the opposing sides. Organisational symmetry can also be of great importance and in individual cases it can contribute to partial compensation of technological asymmetry.

Certain authors point to an asymmetry in patience, perseverance and time perspectives, which is particularly significant in conflicts between opposing parties who have different cultural perceptions of warfare (METZ-JOHNSON 2001).

There are several definitions with content for asymmetric threats, but in principle, the term is also used to describe the attack on institutions of states that do not have adequate equipment and the tactics of which are specific in form and expressed goals. Based on certain analyses, it is possible to conditionally determine the determinants of asymmetric warfare (LAMBAKIS et al. 2002).

An asymmetric security threat is a new, surprising, unusual and unexpected threat. This threat is conditioned by the current historical security circumstances faced by the national institutions and by the position and attitudes of certain states according to the global foreign and security policy.

The general system of the state organisation shows latent institutional weaknesses in the current, classic way of responding to security threats and is predominantly aimed at preventing and deflecting consequences and less at prevention and building a protection system. The existence and application of new tactics and developed operational capabilities as well as technical and non-conventional means in the action of the adversary can be ascertained.

According to the time of implementation, asymmetric action can be short-term or long-term, as well as variable in terms of the use of methods, technology, organisation, etc. Also, any asymmetric operation can have a physical and psychological component.

According to the possible effects, asymmetric action can be defined as: effect according to the population (number of the affected population, degree of destructive effects of the affected population); economic effect (economic losses and degree of destruction of economic and service potential); environmental effects; political effects; psychological effects; public health consequences (METZ-JOHNSON 2001).

### The term hybrid threats

The term hybrid threat refers to an action conducted by state or non-state actors, whose goal is to undermine or harm a target by influencing its decision-making at the local, regional, state or institutional level. Such actions are coordinated and synchronised and deliberately target the vulnerabilities of democratic states and institutions. Activities can take place, for example, in the political, economic, military, civil or information domains. They are conducted using a wide range of means and designed to remain below the threshold of detection and attribution (Hybrid CoE 2022).

The current transition in international power structures provides a fertile environment for hybrid action. The intensifying conflict of values between the West and authoritarian states erodes international norms and institutions making open Western societies targets for comprehensive hybrid action.

A conflict of values that extends to the domestic sphere of Western societies increases polarisation and disunity within and among Western actors, making them more vulnerable to external interference. Recent developments in modern technology and an increasingly complex information environment provide powerful instruments for hybrid actors if not properly countered by the Western community.

Hybrid warfare is based on the discovery of hybrid risks and the creation of hybrid threats to the security of a state, all in order to influence its weaknesses and enable the realisation of one's own interests, without (or with minimal) use of direct military power.<sup>1</sup>

The concept of hybrid warfare sublimates in itself a combination of conventional, unconventional, terrorist, criminal, psychological, economic, energy and other instruments for the destabilisation of the state, i.e. a combination of the use of illegal combat operations, sponsorship, organisation and implementation of political protests, economic measures, which are followed by strong information campaigns, psychological-propaganda activities, the misuse of various information, the use of social media (the Internet) for propaganda purposes, but also as a tool for radicalisation, financing, etc.

Hybrid warfare can be carried out by state or non-state entities, whereby it is mandatory that the engaged non-state actors have the support of a certain external state entity.

<sup>1</sup> See [https://repository.ukim.mk/bitstream/20.500.12188/2308/1/acvetanovska2019\\_1.pdf](https://repository.ukim.mk/bitstream/20.500.12188/2308/1/acvetanovska2019_1.pdf)



According to certain theories, hybrid warfare unites a whole spectrum of different models of warfare that are conducted with conventional, unconventional tactics and engaged forces, including violence and civil unrest, as well as criminal activity (HOFFMAN 2007).

Emergent forms of action can range from violent secessions or annexation of a part of the territory, overthrowing the government or changing the political system in a country.

All these and other aimed at destabilising the state or changing the government in it, are organised and implemented in order to achieve the strategic interests of the great powers or the isolated centres of power (corporation, internal groups) with the aim of determining the state of disruption of the balance of power in international relations and the realisation of one's own interests, mostly by non-combatant means (KOFMAN–ROJANSKY 2015).

In accordance with modern trends, new dimensions of conflicts are also emerging. The main dimension of hybrid warfare is covert subversive activity used against objects of aggression as the main means of destroying the enemy.

In the modern global environment, every national country determines the need for constant development of the national security policy and the ability to respond to changes, because external and internal challenges, risks and threats change continuously and rapidly and are very complex, they are connected and often unpredictable.

The strengthening of the power of non-state actors further complicates the security situation in the world. Changes in global power centres will affect a number of regional and local events and processes that can significantly affect national security challenges and threats. The geopolitical contest of the great powers influences the outbreak of interstate and intrastate conflicts.

Building national resilience is the primary responsibility of member states, because countering hybrid threats is about national security and defence.

Resilience is a national responsibility. Resilience is the ability of an individual, household, community, country or region to withstand, cope with, adapt to and quickly recover from stresses and shocks such as violence, conflict, drought and other natural disasters without jeopardising long-term development (European Commission 2016).

## Conclusion

Today, every country should be able to adapt to the unpredictable, complex and changing security reality. This implies the need to build national capacities to improve

resilience to these threats through a broader, more integrated and better coordination approach at the national level.

Today, many member states face common threats that can be more effectively addressed at the level of the European Union. The European Union can be used as a platform to strengthen national efforts and, through its regulatory capacity, establish common benchmarks that can help raise the level of protection and resilience across the EU.

The EU can therefore play an important role in improving our collective situational awareness, in building Member States' resilience to hybrid threats and in crisis prevention, response and recovery. Modern threats have a complex content, and therefore the need to respond to the entire society is imposed. Strengthening resilience requires a long-term approach based on mitigating the root causes that contribute to crises and strengthening capacities to better manage future uncertainty and change.

In relation to security, there is a resilience approach, which would identify and reduce vulnerabilities, and will minimise the effects of potential threats, which points to the importance of the capabilities of entities that have response and recovery actions. In order to ensure a comprehensive approach to the resilience of critical entities, each Member State should have a strategy for improving the resilience of critical entities. The strategy should set out the strategic objectives and policy measures to be implemented. When setting their strategies, Member States should take due account of the hybrid nature of threats to critical entities. The purpose of the Strategy for building resilience and dealing with hybrid threats is to create a common awareness of the nature of hybrid threats, mapping the obligations and bearers, identifying the ways of action, as well as creating resources for building national resilience by engaging the entire society.

If the three core methods (detection, rejection and response to threats) are accurately applied, national resilience and dealing with hybrid threats can be properly realised.

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## Emotion Comprehension and Executive Functions in Children with Attention- Deficit/Hyperactivity Disorder<sup>1</sup>

### Abstract

Attention-Deficit/Hyperactivity Disorder (ADHD) was shown to be associated with an increased risk for delinquency and legal problems. Executive dysfunction and emotional dysregulation may be connected to this risk. However, less is known about the relationship between emotion comprehension and executive functioning in children with ADHD. The study aims to assess this relationship. A clinical sample of 133 children was assessed by the Test of Emotion Comprehension (TEC) and the Test of Attentional Performance for Children. Age was positively related to TEC total score, but no gender differences were found. Higher scores in TEC were related to lower variability of performance, and less error in KiTAP Divided Attention and Flexibility tasks. Emotion comprehension skills might be related to cool executive functioning, such as the ability to pay attention to two tasks at once and the ability to shift attention between different objects or levels of focus. Training executive functions in children with ADHD may enhance their emotional competence and may add to a better outcome.

**Keywords:** attention-deficit/hyperactivity disorder, emotion comprehension, executive function, school-aged children

<sup>1</sup> This research has been supported by the National Research, Development, and Innovation Office, OTKA-PD-134849 grant.

## Introduction

### *Attention-deficit/hyperactivity disorder*

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterised by attention deficit, hyperactivity and impulsivity (American Psychiatric Association 2013). ADHD is one of the most commonly diagnosed neuropsychiatric diseases in children, with a broad phenotypic spectrum and various severity (DYCK-PIEK 2014). Diagnostic criteria based on the Diagnostic and Statistical Manual of the American Psychiatric Association, fifth edition (DSM-5, APA, 2013) include the presence of at least six symptoms from the attention deficit and/or hyperactivity/impulsivity symptom groups (including 9–9 symptoms each) for at least 6 months with their onset before ages 12 years and significant functional impairment in at least two domains. ADHD is associated with a high prevalence of other neuropsychiatric disorders. Specific learning disorders are one of the most common comorbidities as they are observed in up to 50% of all ADHD cases (SPENCER 2006). A wide spectrum of accompanying neuropsychiatric diseases ranges from internalising symptoms (e.g. depression, anxiety, low self-esteem) to phenotypes with externalising features (e.g. oppositional defiant and conduct disorders, substance use disorders), pervasive developmental disorders and other frontostriatal disorders (MAK et al. 2022).

### *Executive functioning in ADHD*

Executive dysfunction has been suggested to be a core feature of ADHD (BARKLEY 1997). The heterogeneous aetiology of ADHD contributes to considerable neuropsychological variability. Substantial clinical manifestations have been associated with early risk factors, such as tobacco or other substance use during pregnancy, premature birth, low birth weight and early trauma (THAPAR et al. 2009). Notably, genetic risk factors have also been widely recognised in ADHD pathogenesis underlying the familial nature of ADHD (LI et al. 2022). Environmental and genetic factors are together implicated in detrimental frontostriatal events with additional disturbances of the dopamine and noradrenaline neurotransmitter system (PLISZKA 2005), and bottom-up and top-down regulatory systems of the brain. Disturbances of the delicate balance

of the two, particularly the down-regulated top-down responses are key mechanisms of ADHD pathogenesis (PETROVIC–CASTELLANOS 2016).

Executive functions are top-down mental processes, which enable the individual to effortfully adapt to novel or unanticipated challenges, when going on autopilot or relying on intuition is non-adaptive (DIAMOND 2020). Executive functioning includes core functions such as inhibitory control, working memory and cognitive flexibility, and more complex processes such as planning, reasoning and organisation. Based on the presence of affective factors, executive functions can be divided into cool and hot skills. Cool cognitive functions are independent of affective factors and encompass core executive functions which are associated with the dorsolateral part of the prefrontal cortex, while hot executive functions, associated with the ventral and medial area of the prefrontal cortex, including the anterior cingulate cortex, are highly dependent on emotions and motivation, and on their effect on cognitive functions (EMOND et al. 2010).

In children, medium-sized relationships between ADHD symptoms and deficits in cold executive functions, such as inhibitory control, alertness, spatial working memory and planning have been described in a meta-analysis, but none of them was necessary or specific for ADHD (WILLCUTT et al. 2005). The importance of hot executive functioning, e.g. decision-making and reward processing has also been emphasised in ADHD (SJÖWALL et al. 2013). Because of the high variability and low specificity of executive dysfunction, some theorists suggested that not specific deficits but high variability of the performance is the most important feature that may characterise ADHD (CASTELLANOS et al. 2006).

### *Emotional functioning in ADHD*

Deficits in emotional self-regulation are also characteristic of ADHD, influencing behaviour and social functionality (BARKLEY 2010; BUNFORD et al. 2015). In their meta-analysis, Graziano and Garcia (2016) found that ADHD in youth is associated with increased emotional reactivity/negativity/lability and deficits in emotion regulation skills with a large effect size, and is related to impaired empathy or higher levels of callous-unemotional traits and deficits in emotion recognition/understanding with medium effect size. That is, youth with ADHD may have stronger reactions to an emotional experience, may regulate their emotions less efficiently, and to a lesser

extent, may have problems in processing emotional information at a basic level, and may show lower levels of guilt, empathy and caring for others. It is important to note that when exploring the effects of possible moderators, Graziano and Garzia (2016) found that age and cognitive functioning moderated the relationship between ADHD and emotional reactivity/negativity/lability. Furthermore, the association between ADHD and empathy/callous-unemotional traits became weak when controlling for co-occurring conduct problems.

### *Executive functions and emotional functioning in ADHD*

Though it was shown that emotional understanding requires intact executive functioning (LI et al. 2022), especially inhibitory control (RHOADES et al. 2009), working memory (MORRA et al. 2011) and cognitive flexibility (SILKENBEUMER et al. 2016), there is little research on the relationship between executive functions and emotional self-regulation in children with ADHD. Some studies showed that deficits in working memory (GROVES et al. 2020; TARLE et al. 2021) but not in inhibitory control and set-shifting (GROVES et al. 2022) were related to emotional dysregulation in ADHD. Sjöwall and colleagues (2013) found that emotional recognition and regulation skills for different emotions were related to inhibition, working memory and set-shifting skills. Effect sizes were small, only the association between set-shifting and the recognition of sadness reached medium effect. Importantly, emotion regulation skills, as well as the recognition of anger were inversely related to reaction time variability, and effect sizes were medium.

### *Aims of the present study*

Previous studies focused on limited aspects of emotional understanding skills in children with ADHD. Therefore, there is a need for a comprehensive assessment of the skills in these samples. Our study aims to assess the performance of children aged 6 to 10 diagnosed with ADHD in a comprehensive battery of emotion comprehension and to explore the relationship of emotional understanding and cool executive functions.

Based on the literature review, we hypothesised that children with ADHD will show poorer performance in emotion comprehension tasks than described in non-clinical samples. We also hypothesised that poorer performance in emotion comprehension will be related to both increased reaction time variability and deficits in inhibitory control and set-shifting.

## Methods

### *Sample and procedure*

One hundred thirty-three children with ADHD diagnosis combined presentation were involved. Exclusion criteria were intellectual disability and pervasive developmental disorders. All children were newly diagnosed and, therefore without medication. The mean age was 8.36 years ( $SD = 1.28$ , range: 6–10 years). About three-fourth of the children were boys ( $N = 101$ , 76%), in line with the well-known gender difference in the prevalence of ADHD (DSM-5, APA, 2013). They all lived in the capital and the agglomeration.

The study was part of a larger research program focusing on the pragmatic skills of children with neurodevelopmental disorders. Ethical approval was obtained by the institutional ethical committee. Informed consent was given by the parents.

Measure ADHD Child Evaluation – ACE (YOUNG 2015). ACE is a semi-structured diagnostic interview to assess the presence of the 18 symptoms of ADHD in both home and institutional settings and the degree of impairment in children aged 5–16 years. ACE also assesses potential risk factors and comorbid conditions with a series of questions to provide a comprehensive picture of the child's functioning. The scoring of the diagnostic interview allows for classification according to the DSM-5 and BNO-10 criteria by summing up the symptoms. The interview was recorded with the parent during the research, with the aim of confirming the clinical diagnosis of ADHD. The data obtained from the statistical analysis were not used in further analyses.

Test of Attentional Performance for Children – KiTAP (ZIMMERMANN et al. 2002). The KiTAP test, a validated and reliable neuropsychological test measuring attention-related functions through nonverbal attention components, assesses several parameters including Alertness, Go/no-go (inhibitory control), Distractibility, Divided Attention and Flexibility (set-shifting). The computer-based test is set in an enchanted castle



where the child is faced with various tasks involving ghosts, dragons, owls, witches and other magical creatures. We used the t-scores of the median and SD of reaction time and the number of errors and omissions for statistical analyses. Norm values are given taking age and gender into account.

Test of Emotion Comprehension (PONS-HARRIS 2000). TEC assesses nine domains of emotional understanding, namely, the recognition of emotions, based on facial expressions; the comprehension of external emotional causes; memory influence on emotions; the impact of desire on emotions; emotions based on beliefs; the possibility of hiding an emotional state; the possibility of emotional regulation; having mixed emotions; and contribution of morality to emotional experiences. Components of the test are interrelated and developmentally hierarchical, following 3 stages: the external phase in 3–6-year-old children (recognition, external, reminder), the mental phase in 5–9-year-old children (desires, belief, hidden) and the reflective phase in 8–11-year-old children (regulation, mixed, moral). Originally, TEC was a picture book composed of 23 cartoon scenarios. We used a computerised version which was created by Róbert Korényi in cooperation with our research group. For the first five boards, the child is asked to identify the correct facial expression corresponding to the target emotion (happy, sad, angry, scared, well). Each remaining board presents a story with a main character's face left blank, and the child is asked to select the appropriate emotion for the story character from four choices. Good psychometric properties of the TEC have been reported by several studies (ALBANESE et al. 2006; PONS et al. 2004; ROCHA et al. 2013). For the analyses, we used the binary evaluation of each task (completed – not completed), and calculated the total score, that is, the number of completed tasks ranging from 1 to 9.

### *Statistical analyses*

Descriptive statistics for the TEC and KiTAP parameters are provided. Pearson's correlation was used for assessing the relationships between TEC total score and KiTAP parameters (t-scores). The relationships between age and TEC total score, as well as KiTAP performance were assessed by means of Pearson's correlations, and gender differences were assessed by means of independent sample t-tests. Bonferroni correction for multiple statistical tests was used ( $\alpha' = .05/13 = .004$ ).

## Results

### *Performance in TEC*

The average number of completed tasks in TEC was 5.38 ( $SD = 1.79$ , range: 1–9). Age was positively related to the number of completed tasks ( $r = .288, p = .001$ ), but no gender differences were found ( $M_{boys} = 5.36, SD = 1.83, M_{girls} = 5.47, SD = 1.67, t(131) = .309, p = .758$ ).

About 60% of the children completed each of the three tasks of the external component of emotional understanding (Table 1). In the second, mental component, the picture is a bit complicated. While less than 60% of the children completed the task requiring the understanding of the role of emotion beliefs, more than 80% of them were able to understand the role of emotion desires and to identify hidden anger. In the third component (reflection), half of the children failed to recognise mixed emotions and most of them (90%) failed to complete the task requiring the ability to understand the effect of morality on emotions. However, a relatively large proportion of the children identified well the most adaptive way of emotion regulation (72%).

Table 1: *The proportion of children who completed each TEC task*

<i>Age (years)</i>	<i>6 yrs</i>	<i>7 yrs</i>	<i>8 yrs</i>	<i>9 yrs</i>	<i>10 yrs</i>	<i>Total</i>
<b>N</b>	<b>N = 11</b>	<b>N = 27</b>	<b>N = 30</b>	<b>N = 33</b>	<b>N = 32</b>	<b>N = 133</b>
<b>External component</b>						
Recognition <i>N</i> (%)	9 (82)	16 (59)	19 (63)	20 (61)	24 (75)	88 (66)
External causes <i>N</i> (%)	5 (46)	13 (48)	19 (63)	20 (61)	24 (75)	81 (61)
Reminder <i>N</i> (%)	5 (46)	18 (67)	16 (53)	19 (58)	17 (53)	75 (56)
<b>Mental component</b>						
Desire <i>N</i> (%)	9 (82)	18 (67)	27 (90)	25 (76)	31 (97)	110 (83)
Believes <i>N</i> (%)	5 (46)	12 (44)	17 (56)	19 (58)	25 (78)	78 (59)
Hidden <i>N</i> (%)	8 (73)	22 (82)	27 (90)	24 (73)	26 (81)	107 (81)
<b>Reflective component</b>						
Regulation <i>N</i> (%)	7 (64)	16 (59)	24 (80)	23 (70)	26 (81)	96 (72)
Mixed <i>N</i> (%)	4 (36)	9 (33)	8 (37)	19 (58)	24 (75)	67 (50)
Moral <i>N</i> (%)	1 (9)	1 (4)	3 (10)	5 (15)	4 (13)	14 (11)

*Note:* TEC: Test of Emotion Comprehension.

*Source:* Compiled by the authors

*Performance in KiTAP*

The standard deviation of the reaction times was high (Alertness SD t-score < 40) in almost half of the children (48%), that is, their performance was characterised by high variability (Figure 1). The percentage of children with poor performance (t-score < 40) was highest for errors in the Flexibility task (42%), in the Go/No-go task (37%), in the Distractibility task (29%) and omissions (35%) in the Go/No-go task. The percentage of children with a t-score < 40 in at least one parameter of the tasks was 62% for the Go/No-go, 52% for the Distractibility, 40% for the Divided Attention and 47% for the Flexibility task. Only 14% of the children had no t-score < 40 in any parameter.

Age was negatively related to t-scores of omissions in the Distractibility task, that is, performance increased with age ( $r = -.300, p = .001$ ). After Bonferroni correction, no gender differences were found (Figure 1).

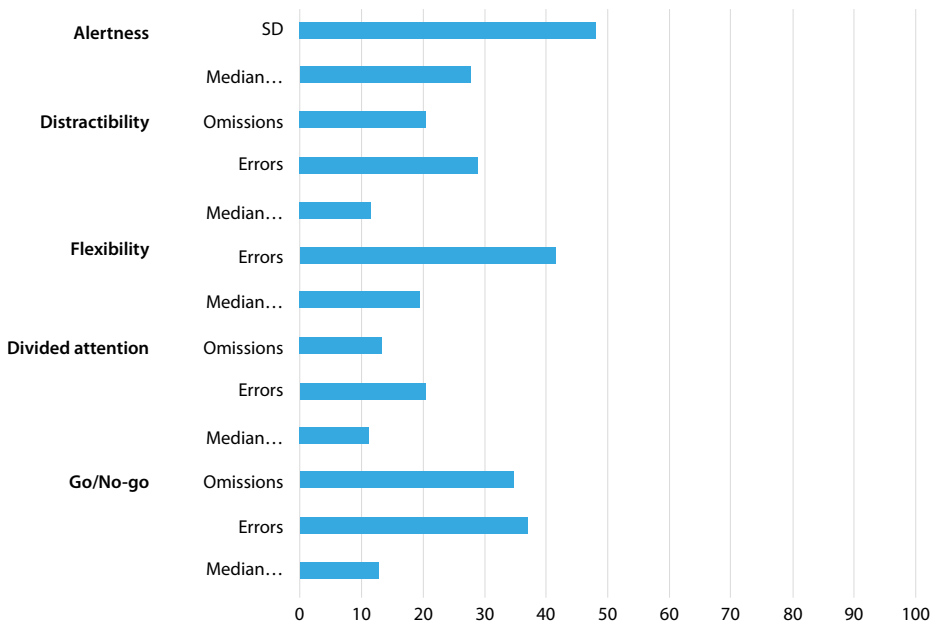


Figure 1: Percentage of children with t-scores less than 40 in KiTAP parameters

Note: Some children were unable to complete the whole neuropsychological battery, therefore, sample size varied:

$N_{Alertness} = 133, N_{Go/No-go} = 133, N_{Distractibility} = 130, N_{Divided\_attention} = 99, N_{Flexibility} = 112.$

Source: Compiled by the authors

*The relationship between emotional understanding  
and cool executive functions*

Pearson's correlational coefficients were calculated between TEC total scores and KiTAP parameters (t-scores). After Bonferroni correction, higher TEC total scores were related to lower variability of performance in KiTAP Alertness ( $r = .320, p < .001$ ), and fewer errors in the Divided Attention task ( $r = .299, p = .003$ ). As a tendency, errors in the Flexibility task were also related to the TEC total score ( $r = .231, p = .014$ ). Effect sizes were small to medium.

## Discussion

Between 24% and 50% of children with ADHD experience emotion dysregulation (SHAW et al. 2014), which contributes to functional impairment, especially social difficulties associated with ADHD (BIEDERMAN et al. 2012). Emotional dysregulation may be due to both deficits in emotion comprehension and executive functioning (GRAZIANO–GARCIA 2016; SHAW et al. 2014). However, there is little research on the relationship between emotion comprehension and executive functions in children with ADHD (GROVES et al. 2020; GROVES et al. 2022; TARLE et al. 2021). Therefore, the aim of the present study was to explore the associations between emotion comprehension and executive functioning in children aged 6–10 years, diagnosed with ADHD.

We found no gender differences in emotion comprehension but found, in line with Pons et al. (2019) that this ability increases with age in children with ADHD as well. Compared to previous studies in typically developing children (CAVIONI et al. 2020; PONS et al. 2004; ROCHA et al. 2013), we found that fewer children with ADHD were able to complete the tasks in the first domain related to external situational causes of emotions. In non-clinical samples, 90–100% of children above 6 years old completed the first two tasks of the TEC assessing emotional recognition and external situational causes of emotions, and more than 80% of them responded correctly to the task assessing the role of reminder on emotions, while in our sample, less than two-thirds of the children completed these tasks. These results suggest that children with ADHD may have a developmental delay in the first (external) component of emotion comprehension.

In the tasks of the mental component of emotional understanding, 44–78% of the children in our sample were able to recognise the role of emotion beliefs, which is

comparable to the results of Cavioni and colleagues (2020), who found completion rates of 49–76% in this age groups. Similarly, children with ADHD performed relatively well in understanding emotions caused by desires (67–97% in our sample and 75–95% in CAVIONI et al. 2020) and recognising hidden anger (73–90% in our sample and 55–90% in CAVIONI et al. 2020). The results suggest that children with ADHD may be as good as typically developing children in understanding internal causes of emotions, probably due to their intense experience of desires and emotions.

Research in non-clinical samples revealed that the reflective component of emotion comprehension is under development in children aged 6 to 10. In line with these results, we found that a large proportion of children with ADHD had difficulties recognising mixed emotions and understanding the effect of morality on emotions. However, it is important to note that children with ADHD showed comparable performance in recognising the most adaptive way of emotion regulation. Completion rates ranged between 59 and 81%, whereas in non-clinical samples it was between 43–75% (CAVIONI et al. 2020), 70–79% (ROCHA et al. 2013) and 35–80% (PONS et al. 2004). These results contradict previous studies showing that children with ADHD have substantial difficulties in regulating their emotions (GRAZIANO–GARCIA 2016), and suggest that children with ADHD may have knowledge about adaptive ways of emotion regulation, but they may be unable to utilise this knowledge in emotionally significant situations.

In line with previous studies (WILLCUTT et al. 2005), we found that most of the children with ADHD showed executive dysfunction in at least one domain, mostly in response inhibition and set-shifting. An increased variability of reaction times was also present in almost half of the children (CASTELLANOS et al. 2006). The correlation of medium effect size between emotional understanding and variability of performance suggests that it may partly explain the deficits in emotional understanding, as previous research found (SJÖWALL et al. 2013). Fewer errors in the Divided Attention and Flexibility tasks were also related to better emotional understanding in our sample. Though previous studies showed mixed results (GROVES et al. 2020; GROVES et al. 2022; SJÖWALL et al. 2013; TARLE et al. 2021), our results add to this field by revealing that specific executive functions such as the ability to divide attentional focus and to flexible shift attentional focus may be important in emotional functioning. Our results are in line with the notion that cognitive flexibility may be an important factor in social-emotional competence (SILKENBEUMER et al. 2016).

The results can be viewed in light of the study's limitations. First, the cross-sectional design does not allow for testing causal relationships. Second, we did not control the

analyses for possible confounders such as socio-ecological factors and comorbidity. Third, we did not have a control group; we compared the performance of the clinical group to the normative data from previous studies. Fourth, we did not assess working memory, though it may be relevant in emotion comprehension.

Despite these limitations, our results underline the importance of the comprehensive assessment of the emotional functioning of children with ADHD. Our results suggest that children with ADHD may pay less attention to external stimuli, but they may experience their desires more intensively which may have an effect on their emotional understanding in different situations. Furthermore, emotional understanding in children with ADHD may be related to both the increased variability of performance and specific deficits in cold executive functioning. Therefore, training in executive functions in children with ADHD may enhance their emotional competence and may contribute to a better outcome.

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Sándor Magyar – Imre Dobák

## The Importance of Security Awareness Thinking in Cyberspace

### Abstract

The ITC environment that pervades our daily lives in cyberspace is increasingly confronted with cybersecurity concerns. While our devices and services make our lives better and more efficient, their use can also carry a number of risks. Think of the growing number of cyberattacks of all kinds, or even the rise of cybercrime. At the same time, trust in cyberspace services in the developed world of the 21<sup>st</sup> century, and their credible and proper functioning, requires the necessary security conditions to be in place. This is true not only in our private lives, but also in various areas of business, government and public administration. All of these require specific defensive elements which, in addition to the technical side, also include the task of reducing vulnerabilities on the human side. In this respect, raising the level of security awareness and research into effective methods will play an important role. The paper accompanying the presentation on this topic deals with this complex aspect.

**Keywords:** cyberspace, awareness, security

### Introduction

Cyberspace is playing an increasingly important role in our daily lives. Our comfort and efficiency are supported by IT services not only in our private lives, but also in our working environment. The evolution that electronic information systems have undergone over the last decade has brought us both great opportunities and very

serious threats. In our changing world, the benefits of the digital ecosystem are drawing the attention of criminals to cyberspace. In parallel, the number and complexity of cyberattacks in virtual space are growing, as is the damage caused by cybercriminals. The effects of cyberattacks, whether it is the theft of data or the rendering of systems inaccessible, are all causing increasing damage to both civil society and public and governmental sectors.

Emerging and disruptive technologies, such as quantum computing, artificial intelligence, the proliferation of autonomous transport vehicles, can be both for and against security. In response, the risks that emerge with the development of these technologies will also require larger-scale security mechanisms. Just think of the challenges posed by the rapidly developing field of artificial intelligence, and in particular the ethical and moral issues raised by autonomous devices and robots. The issues of networking and interdependence also underpin the topicality of the subject, and attacks on supply chains also require greater attention from the defence side.

Prevention, detection and remediation are the triple bottom line for categorising cybersecurity activities. Prevention seems to be the easiest area to defend against attacks, but the cost of the effort is not always commensurate with the risk. This brings to the fore a complex approach, including the importance of human awareness.

## Attitude

But what can be built on to increase the security awareness of individuals? Security-aware behaviour should fundamentally rely on intrinsic motivation, increasing security and understanding the impact of cybersecurity incidents. Timely identification and avoidance of risks is crucial. Awareness-raising should focus not only on learning processes but also on cognitive achievements that can help to understand the impact of negative processes after damage has occurred.

A detrimental approach can be to reinforce the fear of punishment, since, while in many cases “by the book” behaviour and maximum security compliance cannot be bagatelles, fear of punishment can help to keep a significant proportion of cybersecurity incidents in the background (increasing latency). As a result, the impact of cybersecurity incidents is often only faced when the real, often irreversible, damage occurs. The issue of cybersecurity incidents and latency is in itself a wide-ranging area worthy of research, which can be attributed to a variety of causes, whether due to lack of information or human characteristics. Among these, the present study highlights cases where:

- The attacked person does not notice the cybersecurity incident.
- Notices the cybersecurity incident, but fails to appreciate or dismiss its significance (the reasons for this may be due to either personal behaviour or lack of knowledge).
- A false sense of security, whereby security incidents are generally viewed as outsiders.
- Lack of information to report the incident, to minimise the damage (the person does not know who to contact).
- Feeling of shame for actions attributable to the security incident (e.g. negligence, deception, ignorance, inattention).

It is important to emphasise that the above aspects can be general and affect everyone (including us).

### **The target groups and forms**

On the human side of cybersecurity, raising the level of security awareness requires a complex approach. The reasons for this include who the target groups for security awareness can be, either the wider society or an organisation, whose security awareness level can be understood as basically the sum of security awareness at the individual level. This immediately raises the issue of setting expectations at the organisational level, the need for commitment and support from senior management, and the need to raise awareness at the individual level. This approach focuses on methods and solutions that can be put at the service of security awareness. These can range from traditional awareness-raising solutions to training using professional and creative methods.

However, their content and orientation can vary considerably depending on the target groups. It stands to reason that the same depth and subject matter of “knowledge” is not required for a citizen facing cybersecurity threats in everyday life, for participants with professional level of involvement in dealing with them, or for participants with deeper IT knowledge.

For the latter, building on their existing expertise, it may be appropriate to strengthen the cybersecurity perspective. These often take the form of training courses, various specialised courses, but often in different areas of higher education.

This can have an impact on the design of appropriate programmes, where the different levels of basic knowledge, the expected level of motivation, generational

characteristics and the specific aspects of the workplace should be taken into account as a basic element. Knowing these as precisely as possible can increase the likely real success of programmes.

However, the effectiveness of awareness-raising training and programmes can be affected by a number of factors. The learning pyramid also shows, of course, that there are different rates of knowledge retention in different forms of training in each of the traditional (passive) teaching methods and teaming (active) teaching areas.

User and operator training is necessary when introducing different IT systems. However, in the case of post-deployment training, it is not only the necessary value-adding functions and information security requirements that need to be taught, but also the risk of incidents and their impact on confidentiality, integrity and availability.

To convey this responsibility and awareness, various information solutions and formats have been developed and are nowadays available in the form of security awareness programmes/training. The expectation is that these programmes will be able to communicate awareness in the most effective and sustainable way possible.

For those working in this field, the aim is to put in place and develop solutions that are as effective as possible and ensure that awareness is as sustainable as possible. Again, as a general truth, solutions that combine practical elements and delivery modes can be more effective, so shorter training sessions and, at higher levels, more complex cyber defence practice can be an evolving direction. Without going into the advantages and disadvantages of the different methods, it is clear that the design and delivery of practical methods is more time-consuming and often in limited circumstances (number of people, location).

Cybersecurity practices should be highlighted as an important part of improving the cyber resilience of organisations exposed to continuous and direct cyber threats. These secure and controlled environments can create opportunities to simulate real attack scenarios and allow participants to improve their technical skills by identifying previously unseen vulnerabilities or advanced attack methods. The experience gained from the exercises will help organisations to better understand their strengths and weaknesses. Cybersecurity exercises create the opportunity to identify weaknesses in the field and make an effective contribution to increasing cyber resilience.

On the awareness side, software development can be specifically mentioned. Software developers do not necessarily have the knowledge, skills and abilities to judge the extent to which they comply with secure coding guidelines (GASIBA et al. 2020). These flaws are largely brought to light during vulnerability assessments, software

security scans. However, the need and added value of coding in awareness warnings, in addition to functional and security testing, is already growing in software development.

## Motivation

An important element of safety awareness programmes is the active, motivated attitude and participation of participants. This is often difficult to achieve, as participants often see participation in programmes as a compulsory element. Nevertheless, the tools for motivation can be wide-ranging (e.g. rewards), but most often they are not used.

Accordingly, the underlying aim is that participants leave such programmes not only “safer” but also with experiences that can be used at an individual level. This is where, among other things, the increasingly playful elements and forms of training (gamification), which are also visible in the literature, are valued. These can further increase the effectiveness of the programmes, either at individual level or in group form.

The advantages of the increasingly popular gamification approach are that its various forms can provide a specific framework (e.g. time limits, existence of “rules of the game”, no real responsibility) for safety awareness programmes. Their advantages include:

- can increase the willingness to participate in programmes
- can contribute to a more permanent retention of information through their practical elements
- the results, including successes and failures, provide feedback to participants
- can enhance a more complex approach, interpreting the impact of action taken or not taken
- the opportunity to compete and form opinions without real stakes
- make participation an overall experience of success for the participants

The above may be a good indication that the development and application of appropriate methods of safety awareness is a complex task that requires continuous adaptation to the challenges of cyberspace.

Of course, it can also have a motivating effect if, for example, safety-conscious behaviour is counted as a plus in the annual performance appraisals of employees, and a minus if it is ignored. Of course, this is not intended to provide a cognitive understanding of the potential impact on the individual or organisation, but rather to measure the individual from the outside.

In our everyday activities in cyberspace, vulnerabilities that go back to human characteristics are constantly present. Mistakes, inattention, lack of motivation on the part of employees, but also deception and manipulation are mostly intentional, pose a serious risk in the field of cybersecurity. Being prepared for these, being aware of the threats in cyberspace and adopting the right behaviours can all contribute to reducing information security incidents, thereby increasing cybersecurity. Of course, for Digital Natives, Digital Immigrants (PRENSKY 2001), different areas of awareness training may lead to greater success. Those who are introduced to the use of IT tools early in life, who go through some “learning money”, will experience their later conscious use differently.

### Final thoughts

In the future, understanding the impact of threats from cyberspace, like physical space, will become a basic condition for “survival”. Conscious behaviour, as a form of prevention, could be one of the main areas for enhancing security. However, this may not be given sufficient attention today, even though awareness and a security mindset need to be strengthened. There are, of course, many different levels and contexts for this, whether we are talking about taking account of generational specificities or finding appropriate forms of training and education for professionals, from the ordinary user. All in all, it is clear that cybersecurity, which is seen as a “technical area” for the ordinary person, cannot do without the importance of the human factor, which is at least as important as cybersecurity.

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Ana Belajdžić – Tea Beissmann

## Enhancing Job Satisfaction among Croatian Healthcare Professionals: Examining the Interplay of Perceived Social Support, Work Engagement and Job Satisfaction

### Abstract

In light of the numerous advantages associated with heightened job satisfaction among healthcare professionals, affecting their well-being and the quality of service delivered to patients, it becomes imperative to systematically investigate the determinants of job satisfaction, particularly during challenging periods when healthcare professionals (consider) leaving the country. This research explores the mediating role of work engagement in the relationship between perceived social support and job satisfaction. A total of 1,410 Croatian healthcare professionals actively participated in the study, completing the Sociodemographic Questionnaire, Job Satisfaction Index, Social Support Questionnaire and the Utrecht Work Engagement Scale. The results of a mediation analysis conducted using the SPSS PROCESS Macro (3.0, Model 4) reveal that perceived social support and work engagement both significantly and positively predict healthcare professionals' job satisfaction. Elevated levels of perceived social support directly enhance job satisfaction and exert an indirect effect through heightened work engagement. This finding suggests that healthcare professionals perceiving increased social support are more likely to experience job satisfaction, partially attributable to their high level of engagement. The conclusions of this research contribute to enhancing awareness regarding the crucial role of social support and work engagement in fostering job satisfaction among healthcare professionals.

**Keywords:** job satisfaction, work engagement, social support, Croatian healthcare professionals

## Introduction

Work plays a significant role in the lives of employed individuals, with an average of one-third of the day spent in the workplace. For these reasons, it is crucial that employees experience job satisfaction, as it contributes to their overall well-being. Job satisfaction not only impacts the individual but also extends to their surroundings, including their family and friends. In light of the numerous advantages associated with heightened job satisfaction among healthcare professionals, affecting their well-being and the quality of service delivered to patients, it becomes imperative to systematically investigate the determinants of job satisfaction, particularly during challenging periods when healthcare professionals (consider) leaving the country. Job satisfaction can be described as a pleasant feeling arising from the evaluation of one's own work experience – an assessment of what an employee expects from their job and what they believe they can receive in return (LOCKE 1969). Long-term research on the job satisfaction of healthcare professionals suggests that it influences various aspects of work behaviour. In several studies, job satisfaction has been shown to positively interact with work engagement, which subsequently affects other work outcomes such as the quality of care provided by healthcare professionals to patients (ORGAMBÍDEZ-RAMOS – DE ALMEIDA 2017; VAN BOGAERT et al. 2013). Social support, according to the Job Demands–Resources (JD–R) model (SCHAUFELI–BAKKER 2004), is considered a resource of the job – aspect of the work context that facilitates employees' ability to cope with job demands. Social support in the workplace facilitates the exchange of information, re-evaluation of situations from different perspectives, collaborative problem-solving, and the giving and receiving of advice (BROUGH–PEARS 2004). Social support is a crucial factor in subjective well-being, particularly in occupations associated with high levels of stress (BURKE et al. 2012; RYAN–DECI 2001). In contrast to those experiencing burnout at work, engaged individuals feel an energetic connection to their job, viewing it not as demanding and stressful but rather as a challenge (BAKKER et al. 2008). Work engagement can be defined as a positive, fulfilling cognitive-affective state related to work, characterised by vigour, dedication and absorption (SCHAUFELI–BAKKER 2004). Vigour, in addition to a high level of energy, entails mental resilience, a willingness to invest effort in one's work and persistence when facing difficulties. Dedication is characterised by a sense of importance, enthusiasm, pride and challenge. Finally, absorption is marked by complete concentration and joyful immersion in one's work, during which time

passes quickly, and one is reluctant to detach from the task. Existing research on work engagement conducted among medical staff suggests that work engagement influences job satisfaction (ORGAMBÍDEZ-RAMOS – DE ALMEIDA 2017; VAN BOGAERT et al. 2013), the quality of patient care (VAN BOGAERT et al. 2013), organisational commitment (CHO et al. 2006), and turnover intentions (CHOI 2013; VAN BOGAERT et al. 2013). A positive association between work engagement and job satisfaction is confirmed in a sample of Portuguese nurses (ORGAMBÍDEZ-RAMOS – DE ALMEIDA 2017). According to the JD–R model, work engagement plays a crucial role as an intermediary between job resources, such as social support, and organisational outcomes like job satisfaction. However, research by Shahpouri et al. (2016) has raised questions about this mediation. In the study of Shahpouri et al. involving 208 female nurses from Iran, work engagement was found to mediate the effect of personal resources (such as hope, resilience, optimism and self-efficacy) on turnover intention. However, it did not mediate the influence of job resources (including contingent rewards, organisational support and organisational justice) on turnover intention. Interestingly, the analysis revealed no direct or indirect effect of social support on nurses' turnover intention. In a more recent study, Jasiński and Derbis (2023) confirmed that the relationship between support from superiors and job satisfaction among 163 midwives working in the Polish public healthcare system was partially mediated by work engagement. This underscores the necessity for further exploration into the intricate dynamics between social support, work engagement and job satisfaction. Consequently, this research endeavours to investigate the mediating role of work engagement in the relationship between perceived social support and job satisfaction among Croatian healthcare professionals.

## Method

### *Sample and procedure*

The study involved a total of 1,410 healthcare professionals with a minimum of six months job tenure, mostly female (91.3%), from across the entire Republic of Croatia. Employees were recruited through Facebook by sharing the study announcement in several private groups with medical content. The age range spanned from 20 to 63 years ( $M = 35.28$ ,  $SD = 9.895$ ).

### *Instruments*

Healthcare professionals completed the Sociodemographic Questionnaire, Job Satisfaction Index, Social Support Questionnaire and the Utrecht Work Engagement Scale. To determine the sociodemographic characteristics of the participants, a Sociodemographic Questionnaire was used, including questions about gender, age, job role, city of employment and length of service in the current position. As a measure of overall job satisfaction, the *Job Satisfaction Index* (BRAYFIELD–ROTHE 1951) was utilised. This scale assesses an individual's general attitude towards their job (e.g. "I am quite satisfied with my current job" or "I enjoy my work"). The Job Satisfaction Index consists of five items, with responses rated on a five-point scale ranging from 1, indicating "strongly disagree", to 5, indicating "strongly agree". The total score is calculated as the sum of responses to all five items. The theoretical range of scores is from 5 to 25, with a higher score indicating greater job satisfaction. The reliability calculated using the Cronbach's alpha coefficient is  $\alpha = .80$ . To assess social support, the *Social Support Questionnaire* (part of the Job Characteristics Theory test battery MORGESON–HUMPHREY 2006) was applied. The questionnaire consists of six items, with five items pertaining to the degree to which the job provides opportunities and assistance from colleagues (e.g. "People I work with care about me as a person"), and one item addressing support from supervisors (e.g. "My supervisor cares about the well-being of the people who work for him/her"). Responses are rated on a five-point scale ranging from 1, indicating "strongly disagree", to 5, indicating "strongly agree". The total score is the sum of responses to all six items, with a theoretical range of scores from 6 to 30, where a higher score denotes greater social support. The reliability of the questionnaire was measured using the Cronbach's alpha coefficient, with  $\alpha = .76$ . To determine employees' work engagement, the Utrecht Work Engagement Scale – 9 (UWES 9 SEPPÄLÄ et al. 2009) was used. The questionnaire comprises nine items divided into three subscales – vigour, dedication and absorption. Participants rated statements on a seven-point Likert scale ranging from 0, indicating "never", to 6, indicating "daily". The total score for each subscale is calculated as the average of ratings on all items belonging to the respective subscale, and the total score of the questionnaire is the average of all subscale scores. A higher total score indicates higher work engagement. The reliability coefficient expressed as Cronbach's alpha in this study was  $\alpha = .89$ .

## Results and discussion

This research seeks to investigate the mediating role of work engagement in the relationship between perceived social support and job satisfaction among Croatian healthcare professionals. Results of a correlation analysis show that Croatian healthcare professionals that perceive high social support exert higher levels of work engagement and job satisfaction (Table 1).

To verify the mediating role of healthcare professionals' work engagement in the relationship between social support and job satisfaction, we applied the SPSS PROCESS Macro (3.0, Model 4). The results reveal that perceived social support and work engagement both significantly and positively predict healthcare professionals' job satisfaction (Figure 1). Elevated levels of perceived social support directly enhance job satisfaction (0.2112, 0.2734) and exert an indirect effect through heightened work engagement (0.1899, 0.2507). This finding suggests that healthcare professionals perceiving increased social support are more likely to experience job satisfaction, partially attributable to their high level of work engagement (Figure 1).

This finding aligns with the results of Jasiński and Derbis (2023), who confirmed that work engagement partially mediates the relationship between support from superiors and job satisfaction among midwives. The results of this study contribute to a better understanding of the interplay between social support, work engagement and job satisfaction. Additionally, the results highlight the importance of promoting social support and work engagement among healthcare professionals to increase the job satisfaction of medical personnel. However, it is necessary to highlight some research limitations. Specifically, the participants in this study were only those interested in the topic, potentially reducing the possibility of generalising the results to all

Table 1: Descriptive statistics and intercorrelations between measured variables

<i>Variables</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>
1. Job satisfaction	19.61	3.79	–	.56**	.72**
2. Social support	21.56	4.61		–	.46**
3. Work engagement	4.54	0.85			–

\*\* $p < .01$ .

*Source:* Compiled by the authors

medical professionals in the Republic of Croatia. An additional limitation is the lack of conceptual division of social support into support from colleagues, superiors and the organisation, as some studies have confirmed a significant impact of one but not the other sources of support on job satisfaction. Future research should consider the possibility of dividing the construct of social support into support from colleagues, superiors and the organisation and examine whether there are differences between these sources of social support in job satisfaction. Additionally, it would be helpful to assess job satisfaction using a multidimensional questionnaire to determine which aspects of job satisfaction should receive the most attention. Nevertheless, the findings regarding the importance of social support can serve as a guideline for healthcare managers to promote an organisational climate that emphasises and positively values the support provided by colleagues and superiors in daily tasks. Recognising the importance of work engagement can be encouraged by highlighting the significance of their roles and consequences to employees. To foster work engagement, it is crucial to value employees' opinions, provide appropriate feedback on their work, and enable them to learn and develop professionally and personally. Understanding and prioritising the well-being of healthcare professionals is pivotal for creating a thriving and effective healthcare environment.

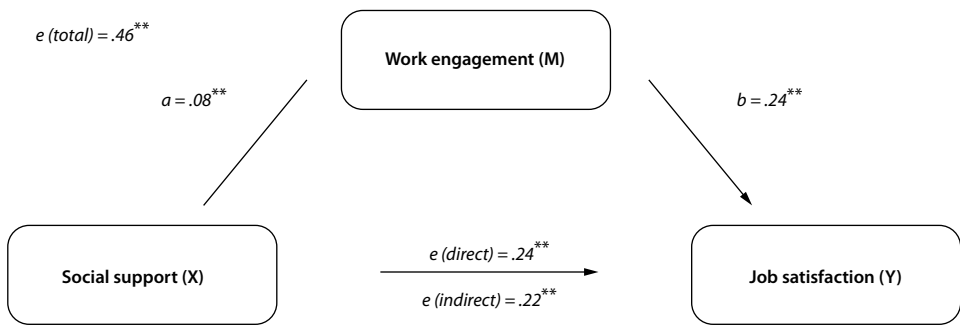


Figure 1: *The mediating role of work engagement in the relationship between perceived social support and job satisfaction*  
Source: Compiled by the authors

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## Health and Well-Being in Prison Context

### Abstract

This study aims to investigate the effects of solitary confinement on an individual's physical and mental health and quality of life. Twenty-three hours confined in hollow singular cells, limited access to fresh air and natural light, and a close control is the common idea of solitary confinement. Data on the negative effects of prisons on inmates' social life, rehabilitative capacities, well-being and health, combined with the lack of transparent information on solitary confinement and supermax prisons, has led to the development of this study, including peer reviewed documents over the last 23 years with empirical research and any correlation with the effects of prison on the adult inmate in solitary confinement. Mental symptoms have been increasing among prison population over the years and were greater than the physical ones, including depression, anxiety, psychological distress, post-traumatic stress disorder, and a multiplicity of personality traits and clinical syndromes. Self-harm and suicide attempt rates were equally alarming. Some quality-of-life aspects include: lower levels of education, an average of 12 months in solitary confinement and higher rates of violence. A higher probability for placement in solitary confinement for those with a previous mental disorder diagnosis. Any time spent in solitary confinement also increased the odds for physical or mental conditions. Moreover, the effects of solitary confinement on the prisoner's health and quality of life are unjustified, as the sentence should only restrict the inmate of his freedom, calling for practical data. We recommend that this line of research be further developed.

**Keywords:** health, prison, solitary confinement, quality of life, well-being

## Introduction

Solitary confinement involves placing a prisoner in a room with restrictive and minimal conditions for 22 to 23 hours a day, having 1 to 2 hours of outdoor exercise or other activity, whenever appropriately supervised, and without contact with other prisoners. Although the conditions and restrictive measures of this front of segregation varies from country to country, the constant idea of confinement is that of a sparsely furnished cell, with limited access to natural light and fresh air, and little to no view of the outside world, confined to a totally artificial environment where they are constantly and closely observed and controlled, with minimal and superficial interactions with staff, with an even higher level of dependency than is normally the case in the general prison population (SHALEV 2008). The increase in the use of solitary confinement for prolonged periods of time in maximum security prisons has led the scientific community and critical elements of society to question the legality and constitutionality of this practice as a cruel and unnecessary punishment, such as: the ethics behind the permissibility of radical isolation; clinical questions about the psychological effects of prolonged isolation; social questions about the rationalisation of crime, among others (GUENTHER 2011).

Most jurisdictions, as for the United States of America, have limited the use of solitary confinement to violations of specific prison rules and for short periods of time. In contrast, the use of solitary confinement in maximum security prisons differs in several important respects, most notably in the extent of isolation, the perceived duration of isolation, the reasons for its imposition and the technological sophistication with which it is achieved. When inmates in these units are escorted out of their cells or beyond the prison units in which they are housed, they are typically first placed in restraints, chained while still in their cells. They are rarely, if ever, in the presence of another person (including doctors and physical therapists) without a variety of physical restraints. Prisoners in maximum security prisons are usually severely restricted in the type and amount of personal property they may possess and in their access to the prison library, court materials and canteen (HANEY 2003). Deprived of daily human contact and confined to a space with very little stimuli, it is natural for any individual to feel disconnected from reality (GUENTHER 2011).

Solitary confinement is subject to greater legal scrutiny and should be the subject of rigorous scientific research (NADAY et al. 2008). There is clear evidence that solitary confinement has a profound impact on health and well-being, particularly for those with pre-existing mental disorders, and that such confinement can also actively cause

mental disorders. The extent of this harm at the psychological level varies and depends on individual factors, the environment, the regime in which they are placed, and the context and duration of their isolation (SHALEV 2008).

Therefore, the aim of this study is to gain a better understanding of the effects of solitary confinement on the well-being and health, both mental and physical, of prisoners, whether in maximum security prisons or not.

### **Solitary confinement effects on mental health**

We tried to review studies of solitary confinement in prisons, whether maximum security or not, in order to answer the guiding question: “What are the effects of solitary confinement on an individual’s physical and mental health?”

Reiter et al. (2020) carried out a longitudinal study with the aim of verifying the prevalence of symptoms and measurements of psychological stress among prisoners in long-term solitary confinement. The authors found similar levels of depression among inmates in solitary confinement and lower levels in the general prison population. Analysis of individual inmate files reveals that 19% have diagnoses of severe mental disorder, 22% had a documented suicide attempt and 18% had documentation of other self-harm, either during their incarceration or during their time in solitary confinement. Participants in the study also mentioned other symptoms such as sensory hypersensitivity (16% of respondents mentioned this at least once) and loss of identity (25% of respondents mentioned this at least once).

For their part, Valera and Kates-Benman (2016) carried out a study using 110 participants aged between 35 and 67 who had been in solitary confinement. The results of the study indicate that around 40% of the individuals have already used mental health services, as well as the existence of a risk of being assaulted by other inmates. More than half were also at risk of being assaulted by prison guards. 15 individuals (14%) with experiences of solitary confinement reported attempting suicide during this period, yet the overwhelming majority (70%) said they felt “safe”. The majority of men spent an average of 2 years in solitary confinement. In their study, Valera and Kates-Benman (2016) also used qualitative interviews with 30 of these participants to explore their experiences during their time in solitary confinement. The interview responses fell into three categories. First, the use of solitary confinement as punishment stands out. In this sense, participants reported feeling punished by being subjected to conditions similar to military conditions and treatment. Second, the interviews revealed that the

first experience of solitary confinement is more difficult for participants because they do not know what to expect. For example, participants mention that life in solitary confinement units is initially “hard” because of the severe restrictions on their freedoms, but is acceptable after a period of adjustment. Finally, although most of the men had experienced punishment and had difficulty adjusting while in solitary confinement, some participants noted that they preferred being in solitary confinement to being in the general prison population, saying that it allowed them to find a certain peace of mind by allowing them to avoid problems such as violence, stress, “meaningless things” and “smells” created by living and interacting with other inmates.

O’Keefe (2007) found that women were more likely to have mental health problems than men, but were less likely to be allocated to administrative segregation. Criminal history and institutional behaviour were useful variables for distinguishing inmates in administrative segregation from those in the general prison population. It was also noted that inmates in administrative segregation were more violent and more involved in security threat groups, and had more disciplinary infractions, and more moments of punitive segregation than inmates in the general prison population. Inmates with mental disorders in administrative segregation showed a higher risk of recidivism, as measured by the LSI-R, following those with mental disorders in the general prison population and those without mental disorders in administrative segregation; for their part, inmates without mental disorders in the general prison population had the lowest scores. Using logistic regression, O’Keefe (2007) found that membership of violent groups appears to be the best predictor, being four times more likely than other inmates. Violent behaviour, being a man with a mental disorder and being Hispanic were also identified as risk factors, even when this last factor was controlled for using other variables, such as belonging to a gang.

In a second study, O’Keefe (2008) found that inmates in administrative segregation were more likely to be male, Hispanic and younger than the general prison population. Prisoners in administrative segregation were more likely to be serving a sentence for a violent crime than the rest of the prison population. Although they did not have higher recidivism rates than the general prison population, the results indicated that they had been institutionalised for longer periods. Similarly, O’Keefe (2008) found that inmates in administrative segregation were 7 times more likely to have been sanctioned prior to administrative segregation. The percentage of inmates in administrative segregation with a mental disorder (25%) substantially exceeded that found in the general prison population (16%), and they also had higher total BPRS scores than the rest of the general prison population. The author also found that, after

entering prison, those inmates who showed schizoid, narcissistic, antisocial, aggressive, passive-aggressive, schizotypal, borderline personality traits or delusional thoughts were more likely to be subsequently placed in administrative segregation.

Likewise, Mears et al. (2021) found that, compared to the general prison population, inmates in prolonged solitary confinement had unique values in almost all dimensions. Men were more often placed in solitary confinement. Mears et al. (2021) found that adolescents and young adults, as well as individuals with mental health problems, were more likely to be placed in prolonged solitary confinement. Substance abuse was slightly higher in the solitary confinement population (46%) compared to the general prison population (40%). For their part, the educational qualifications of prisoners in solitary confinement were lower when compared to the rest of the prison population, but the recidivism rate was lower, which can be explained by the higher percentage of individuals convicted of violent crimes. The profile of individuals placed in prolonged confinement in the first 6 months after incarceration was even more likely to have been in a mental health unit or to have needed outpatient treatment with medication. The consistent pattern across all models of prolonged solitary confinement is that mental health needs predict placement in prolonged solitary confinement just as much as placements in confinement at the start of incarceration and those of longer duration.

For their part, Campagna et al. (2019) developed a longitudinal study with 408 inmates in 3 different time periods who were on state supervision, focusing on how isolation and protective factors affect the inmate's intervention needs, including mental health. They concluded that the number of days in solitary confinement was negatively and significantly associated with mental health, with a 1.7% reduction in the likelihood of receiving a higher mental health score for each day in solitary confinement. The number of days in lockdown did not prove to have a bearing on the propensity to change, but being homeless could decrease this score by 57%. In addition, some variables such as incarceration rate, age, juvenile crime, homelessness and gang affiliation significantly reduced the likelihood of the individual being able to maintain a positive mental health state. However, respect for authority and impulse control did not vary. The number of days in confinement negatively affected behaviour towards an authority figure, with a 2.4% reduction in the likelihood of exhibiting appropriate behaviour towards this figure, but was not related to greater impulse control on the part of the inmate. In addition, being homeless was associated with a 50% reduction in impulse control scores, but completing secondary school managed to increase these scores by 150%. Participation in vocational programs improved propensity to change

scores, with a 0.4% increase in this variable for every hour. Unfortunately, no variable was related to an increase in positive mental health status.

Finally, Hagan et al. (2018) conducted a longitudinal study linking solitary confinement with symptoms of post-traumatic stress disorder in recently released inmates. The majority of the 119 participants in solitary confinement were male (85%), non-Hispanic black (51%) or Hispanic (34%), with an average age of 44 and temporary housing (85%). The reason for being held in solitary confinement was disciplinary action (73%), with 42% being held for between 1 month and 1 year, and 12% for more than 1 year. Many of them had mental health problems (42%), a previous PTSD diagnosis (17%), and had used substances throughout their lives (66%). However, none of these factors differed between those with and without a history of solitary confinement. Comparing their sample with individuals with no history of lockdown, the authors found that 28% of the participants had PTSD symptoms. However, those individuals with a history of lockdown were more likely to report PTSD symptoms than those without, and a history of solitary confinement and chronic mental health conditions were highly associated with a PTSD assessment.

Hagan et al. (2018) proceeded to exclude participants with a previous PTSD diagnosis to eliminate the effect of this variable. However, PTSD symptoms remained more common among those individuals who had been in solitary confinement. Thus, the authors concluded that there is a relationship between PTSD symptoms and solitary confinement, but only among those individuals who do not have a history of chronic mental illness.

### **Solitary confinement effects on physical health**

If there are few studies carried out in prison contexts that address the influence of a prison stay on physical health, there are even fewer that have been carried out during solitary confinement.

Williams et al. (2019) conducted a study in a maximum security prison with the aim of analysing the relationship between cardiovascular disease and the increased prevalence of hypertension diagnosis in people in solitary confinement, using inmates from the general prison population as a comparison group. The authors found that because inmates in solitary confinement experienced a higher prevalence of hypertension than those in the maximum security wing, about one-third may experience this higher burden associated with cardiovascular disease and cost. The authors concluded that

the diagnosis of hypertension persists throughout life, with individuals in prison and in the community experiencing the same control and cardiovascular effects of hypertension. The focus was on hypertension-related cardiovascular diseases and other possible conditions/problems caused or aggravated by solitary confinement were not considered, suggesting that the analysis underestimates the overall impact of solitary confinement on health and other associated consequences.

Strong et al. (2020) examined the relationship between solitary confinement and physical health problems, as well as the health disparities associated with incarceration. To this end, they used a sample of 106 men who had been in solitary confinement for long periods of time. In general, no differences were identified between the sample used and a comparison sample in solitary confinement (who had been in solitary confinement for a shorter period of time), but in relation to the general prison population, the latter being less violent, serving shorter sentences, and less likely to be affiliated with gangs, which the authors associate with the fact that the prison population has a higher average age, and there is a lower percentage of Hispanic individuals among the general prison population. Strong et al. (2020) assessed participants repeatedly and found a persistence of somatic problems over the course of a year, although no statistically significant relationships were found in the variables analysed. Regarding health disparities in the prison population, they identified health problems in 63% of the participants, 48% of whom were taking medication, 17% had arthritis and 8% experienced a relapse during confinement, associating physical symptoms with both deprivation conditions and deprivation policies limiting access to health services, including chronic musculoskeletal pain exacerbated by the intersection of deprivation conditions and policies.

## Discussion

In view of all the databases from which articles and documents were extracted, and observing the small number of studies that focus in some way on the effects of solitary confinement on the physical and mental health of prisoners or that comment on it directly or indirectly, the conclusion drawn in the first instance is precisely the small number of empirical studies observed, as well as the need to develop more research studies on the subject.

There are many effects of solitary confinement on the prisoner's health and quality of life, and this is not only related to deterioration and the possible development of adverse health conditions, as the diagnosis of mental disorder itself also indicates



a greater propensity for the prisoner to be placed in solitary confinement. We therefore need to consider the necessity and ethics of this resource, as well as the effects it has on the population it is used on. On a practical level, more contact with the outdoors, more time for recreational activities would be good practices that, despite the prisoner having to be “punished” for any previous infractions, this punishment should not seriously harm the prisoner’s well-being or their health, physical or mental.

The diagnosis of mental disorders, as well as the effects on the prisoner’s physical condition, would only contribute to a reduction in their quality of life, both in the short and long term, which is unjustified once the sentence is applied for the sole purpose of restricting their freedom. Since this restriction, in a more virile and difficult-to-adapt format, can generate or hasten symptomatic preconditions, other methods should be taken to ensure that this does not happen. More practical studies are required to increase the database that will allow us to indicate with certainty the existing effects of solitary confinement on prisoners, especially in terms of their quality of life, which is interlinked with mental and physical health.

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## Climate Change Impact on Mental Health and Environmental Activism: A Narrative Review

### Abstract

We are witnessing considerable changes in the climate of the Earth that have important repercussions on individuals' health, but also on the civic behaviours adopted by them. This narrative review aims, on the one hand, to systematise the repercussions that the current climate crisis has on the mental health of populations and, on the other, to reflect on their implications for the involvement in climate actions. The psychological responses that arise from climate change are very diverse and may result in what have been called psychoterratic syndromes, which includes eco-anxiety, climate anxiety, climate grief, ecological distress, ecoparalysis, solastalgia, climate sadness, climate anger, climate irritation, climate apprehension, climate hopelessness or climate isolation, but they also can result in climate hope, climate empowerment, climate discontent and climate indifference. Research into the personality of activists has highlighted the association between environmental activism and the personality characteristics of individuals, drawing attention to a potential "dark side" of environmental activists' personality, related to the dark triad traits – Machiavellianism, psychopathy and narcissism – as well as to the association of these traits with left-wing authoritarianism (i.e. antihierarchical aggression, anticonventionalism, top-down censorship). Psychology is in a privileged position to contribute to promoting the mental health of populations faced with climate change and to capitalising on adaptive actions for positive behavioural and policy change.

**Keywords:** environment, climate, activism, eco-anxiety, personality

## Introduction

Research has long proven that direct experiences with natural environments – because of their reparative or restorative effect – have very profound emotional effects on people, for example, diminishing depression, anxiety, stress, anger, substance abuse, attention deficit, improving recovery after surgical procedures, improving cognitive functioning, performance in higher level tasks and creative problem solving (SILVA et al. 2022). But connection with nature also revealed to have an addictive effect. Connection with nature is associated with greater satisfaction with life (MAYER–FRANTZ 2004), positive affect (HERZOG–STREVEY 2008), happiness (WHITE et al. 2019; ZELENSKI–NISBET 2014), psychological, social and emotional well-being (CERVINKA et al. 2012; HOWELL et al. 2011; WHITE et al. 2019), greater meaning in life (CERVINKA et al. 2012; WHITE et al. 2019) and greater vitality (ZELENSKI–NISBET 2014).

Some researchers argue that the connection with nature is important to answer to existential anxieties about our identity, as happiness, loneliness, meaning in life, identity, freedom and death (PASSMORE–HOWELL 2014). Being connected to nature is also important to human flourishing, to experience a life with involvement, interest, meaning and purpose (PASSMORE–HOWELL 2014) and make us more capable of being empathic, of perspective-taking (ZHANG et al. 2014), more generous, more capable of trusting in others, more prone to help them (ZHANG et al. 2014), more connected to others, more caring, more prone to a spiritual attitude and more capable of feeling as being part of something bigger than oneself. Individuals who perceive themselves as connected with nature are more prone to defend the well-being of humanity and social well-being, report higher kindness and altruistic concern (CAPALDI et al. 2015).

The relation between nature and human beings is reciprocally advantageous. On the one hand, individuals who perceive themselves as connected to nature present higher individual well-being, and, on the other hand, this well-being that results from contact with nature is associated with an increase in responsible behaviours on the part of human beings (PASSMORE–HOWELL 2014).

However, despite these positive effects of nature connection, either in consequence of its restorative effect, or because of its protective and addictive effects, people's direct contact with the environment is decreasing, whether due to increasing rates of urbanisation, increased use of new technologies for entertainment or the perception that nearby natural places are unsafe (ROSA–COLLADO 2019). Globally, individuals are experiencing reduced daily contact with nature compared to preceding generations, spending more time inside buildings. Furthermore, we are witnessing considerable

changes in the climate of the Earth that have important repercussions on individuals' health, but also on the civic behaviours adopted by them.

Despite all of the above, we live in a consumer society with extremely harmful environmental impacts, which the planet has not the natural capacity to absorb. According to the United Nations (2021), between 1970 and 2019, natural disasters represent half of all the disasters, being responsible for 45% of all reported deaths and 74% of all economic losses. During this period, more than 11,000 catastrophes attributed to climate change were reported, totalling more than two million deaths and US\$3.64 billion in losses. Furthermore, although the majority of these deaths occurred in developing countries, in European countries, in this period of time, 1,672 disasters occurred and 159,438 citizens died due to natural events like extreme temperatures, floods and storms. The psychosocial reactions that occur in consequence of environmental disasters have been an area of concern for researchers, particularly post-traumatic stress disorders (PTSD), acute stress disorders, depressive disorders, anxiety disorders, sleep disorders, alcohol and drug abuse, aggression and violent behaviour, and absence to work (SILVA et al. 2023).

This narrative review aims, on the one hand, to systematise the repercussions that the current climate crisis has on the mental health of populations and to reflect on their implications for the involvement in climate actions.

### **Climate change impact on mental health**

Gullone (2000) challenges us to question the blindly assumed assumption that the human species has an unlimited capacity to adapt to the environment and to reflect on what occurs to our cognitive capabilities, emotional states, social interaction and mental health when we do not have experiences in nature and Bratman et al. (2012) alerts us to the fact that a significant part of human beings is experiencing the impacts of this withdrawal of nature from their lives.

In fact, it urges to have a deeper understanding about how disconnection from the natural environment can affect physical and psychological health (NISBET et al. 2011), as well as about the repercussions that the current climate crisis has on the mental health of populations and how that impact reflects on the involvement in climate actions.

Simultaneously, we must consider other climate events and environmental situations that, in a different scale, cause an imbalance in individuals when they perceived that their usual skills and strategies for coping with these challenging circumstances

are not effective (SILVA 2009). Distress can also result from the degradation of the environment, degradation of our home and of our sense of belonging. The tension resulting from this stress can make individuals feel unbalanced, vulnerable and that they have no control over their lives (GILLILAND–JAMES 1988; ROBERTS 1990).

Exposures to climatic conditions as heat, humidity, rain, floods, drought and forest fires are associated with psychological distress, diminished mental health and higher mortality in individuals with pre-existing mental illnesses, increased psychiatric hospitalisations and increased suicide rate (CHARLSON et al. 2021). But psychosocial reactions to climate change in the general population very often are not recognised and do not seem to have received the same attention from researchers, despite their severity. Research has proven that climate change can cause a set of psychological reactions – fear, worry, distress and anxiety – which Albrecht (2011: 48) called “psychoterratic” syndromes. Even though it is not easy to prove the existence of a causal relation between climate and environmental crisis and mental disorders, Clayton (2020) recognises “ecoanxiety”, “climate anxiety”, “climate grief” and “ecological distress” (CLAYTON 2020: 2) as being between these negative responses, and Galway et al. (2019) use the expression “earth-related states” (GALWAY et al. 2019: 6) to refer to them. But other reactions have been identified by researchers and clinicians: eco-stress (EFPA 2023), eco-guilt (MALLETT 2012), climate powerless, climate hopelessness, climate sorrow, climate irritation, climate apprehension (MARCZAK et al. 2023) and biospheric concern (CIANCONI et al. 2020).

Furthermore, in scientific literature, we can also find terms as “nature deficit disorder”, “ecoparalysis” and “solastalgia”. The term “nature deficit disorder” was introduced by Louv (2005) to identify the human consequences of alienation from nature, namely the decreased use of the senses, attention deficits and higher prevalence of physical and psychological disorders. In his turn, Albrecht (2011) use the term “ecoparalysis” to refer to people that are incapable of acting because they are excessively distressed by environmental issues (reaction that very often is misunderstood and interpreted as apathy). Furthermore, the term “solastalgia” is applied to refer to the “distress that is produced by environmental change impacting on people while they are directly connected to their home environment” (ALBRECHT et al. 2007: S95).

Increased temperatures and extreme heat phenomena have been associated to increased mood and anxiety disorders, schizophrenia, vascular dementia and suicide risk; droughts have been associated to generalised anxiety, depression, shame, humiliation and increased tension in the family environment; and air pollution revealed to be associated to increased risk of anxiety, depression, psychosis, bipolar disorder impairment in cognitive function, lower level of happiness and life satisfaction, degradation of social

behaviour (increased irritability and higher rates of criminal behaviour), which all increases uptake of mental health services and suicide risk (SILVA et al. 2023).

Even gradual environmental change, as well as chronic and sub-acute climate events – like floods, heat waves, droughts, air pollution, chronic degradation of places in consequence of increased sea levels – can have substantial effects on individuals' mental health, whether they are adults, children or teenagers (VAN NIEUWENHUIZEN et al. 2021). More than half of individuals aged between 16 and 25 report being very or extremely concerned about climate change and demonstrate sadness, anxiety, guilt, annoyance, impotence and helplessness because of this change; many of them report that these feelings affect their functioning and daily life; the majority of them believe that their future is frightening and that human beings are failing in taking care for the planet (HICKMAN et al. 2021).

The psychological responses that arise from climate change are very diverse and not always result in these psychoterratic syndromes. They can also result in climate hope, climate empowerment, climate discontentment and climate indifference. Some of these psychological reactions are less adaptive, being associated with lower well-being, while others are protective of the individual's well-being and allow predicting their involvement in actions to defend the planet.

Some individuals present psychological distance concerning climate change and environmental crisis, that is to say that, for them, climate change is a real concern, but it is a psychological distant one as they see it as something that have impact only in other people, other communities or/and in a distant future (CLAYTON et al. 2021; MAIELLA et al. 2020). Although when individuals perceive climate change as something proximal and concrete, they are more prone to perform environmental protective behaviours; psychological distance does not necessarily constitute a barrier to adopt climate change mitigation and adaptation behaviours (MAIELLA et al. 2020).

### **Environmental activism**

According to the European Federation of Psychologists' Associations (EFPA 2023: 3), "while eco-anxiety and eco-depression are less adaptive, relating to lower wellbeing, eco-anger may be protective of mental health as well as predict greater engagement in pro-climate activism (such as protest or signing a petition) and personal pro-environmental behaviours (such as recycling or use of green energy and less energy consumption)". This perspective has been previously supported by the research of



Stanley et al. (2021). So, despite that some psychological reactions are less adaptive, unconstructive and associated with intrapersonal dysfunction, other reactions are constructive and adaptative (VERPLANKEN et al. 2020), protective of the individual's well-being and allow predicting their involvement in actions to protect the planet, namely of environmental activism, phenomena that is increasing in these times of growing concerns about climate change.

Nevertheless, environmental activism can range from disruptive although non-violent actions to extreme and radical actions, such as, for example, blocking roads, invading premises, throwing paint at ministers, collages on planes, paintings at the headquarters of large companies and civil disobedience.

Research into the personality of activists has highlighted the association between environmental activism and personality characteristics of individuals, drawing attention to a potential "dark side" of environmental activists' personality (ZACHER 2024), related to the following "dark triad traits": Machiavellianism, psychopathy and narcissism.

Machiavellianism is characterised by manipulation of others for personal gain, relative absence of affection in interpersonal relationships, not showing concern with conventional morals, although these individuals are not necessarily immoral, demonstration of low ideological commitment. Individuals who score high in Machiavellianism are not unethical, but they are capable of sacrificing ethics according to their own interests, they are leaders who try to maintain their resources and privileges no matter what the costs and present a cynical worldview. People who score high in psychopathy, present a superficial charm, grandiose self-worth, present pathological deception, are manipulative, present lack of remorse and empathy, shallow affect, increased risk for displaying antisocial behaviour, poor behavioural control, stimulation seeking, impulsivity and irresponsibility. Finally, people who score high in narcissism, strive for uniqueness, have preoccupation with grandiose fantasies, present charming behaviour, strive for supremacy and devaluation of others.

Individuals who present high levels of the dark triad traits can use activism as a way of satisfying their ego-focused needs (as positive self-presentation, status gain, dominance over others, excitement seeking) (BERTRAMS-KRISPENZ 2024). Simultaneously, individuals who present high levels of Machiavellianism and narcissism can, in fact, be more effective in the context of environmental activism that intends to change attitudes and behaviour of other citizens, organisations and governments. Their characteristics seem to constitute an important resource in what concerns to

establishing alliances, leadership of groups, authority and using moral superiority to influence others (PAULHUS–WILLIAMS 2002).

Research has not led to consensus results. Some studies show that psychopathy is not significantly associated with environmental activism (ZACHER 2024), while others show that psychopathy is positively related to individuals' support for violent political activism, including physical attacks (GØTZSCHE–ASTRUP 2021; PAVLOVIĆ–WERTAG 2021).

## Conclusion

In conclusion, research carried out in recent years alerts us to the multitude of risks that climate change poses to mental health, and not only to the risks associated with environmental disasters, but also to the risks associated with climate change of lesser magnitude, previously “invisible” to governments, communities and mental health professionals. These reactions are not only related to mental health problems, they can also be related to pro-environmental actions and to a peaceful environmental activism, but also to violent one. It is important to have a deeper understanding of how the personality traits of activists and leaders of activist groups may be related to adaptive, non-violent environmental actions, but also to violent, extreme and radical ones.

Psychology is in a privileged position to contribute to promoting the mental health of populations who are facing climate change and to capitalising on adaptive actions for positive behavioural and policy change. Not only Climate Psychology can contribute to a greater understanding of the emotions, and of psychological and social processes related to environmental change, but it can also give a significant contribution in what concerns the promotion of citizens' engagement in environmental protection and the promotion of literacy related to environment and climate. This knowledge will constitute an important contribution “to promote and support change at a personal, community, cultural and political level; to support activists, scientists, and policy makers to bring about effective change; to nurture psychological resilience to face the impacts, including in mental health, of climate change happening now and in the future” (EFPA 2023: 3).

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Ludovika University of Public Service has established the Law Enforcement and Psychology (LEPSY) CEEPUS Network with the objective of equipping future legal, law enforcement, police, fire, security and psychology professionals with the competences to address societal challenges through an interdisciplinary approach to education and research.

The LEPSY CEEPUS Conference Book constitutes a collection of papers presented at the 1<sup>st</sup> LEPSY CEEPUS Network Research and Cooperation Conference, which was held on 12 March 2024. The overarching objective of the conference was to promote research on law enforcement and psychology issues in LEPSY CEEPUS Network partner institutions, with a view to strengthening collaboration between researchers. The conference encompassed a diverse range of topics, addressing contemporary issues in psychology, education, organisational behaviour and security studies.