National University of Political Studies and Public Administration

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Communication Sciences

DOCTORAL THESIS

Predictors of permeability to online disinformation and societal resilience

(SUMMARY)

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Introduction

Technological transformations and new media development in the last decade have led to an informational overabundance and, consequently, to the proliferation of false information in digital format, which have reached high levels throughout the world, including Eastern Europe (Benková, 2018; Lazer et al., 2018). There are several terms or phrases that have been used to define the lack of accuracy of information or the context of its manifestation, such as *post-truth* - considered the "Word of the Year 2016" by the Oxford dictionary (Oxford-Dictionary, 2016), *fake news* - selected by the Collins dictionary as "Collins Word of the year 2017" (Collins-Dictionary, 2017), *information disorder* - phrase used by the Council of Europe, with three components: misinformation, disinformation and malicious information (Wardle & Derakhshan, 2017), *infodemic* – word introduced by the World Health Organization in the context of the COVID-19 pandemic (Novel Coronavirus(2019-nCoV) Situation Report - 13, 2020), computational propaganda (Woolley & Howard, 2018), *ampliganda* or crowdsourcing propaganda - phrases that define digital propaganda and indicate the involvement of the audience in the transmission of messages (DiResta, 2021), *disinformation 2.0* - to describe the new phenomenon specific to the current information space that differs from traditional disinformation by the technological support it benefits from, which allows it to reach an incalculable number of internet users (Bouayach et al., 2022, p. 75).

Research objectives

Considering the impossibility to stop the disinformation flow, and the efforts to regulate the online information environment have not led to the expected results, it is important to know how the impact of this informational challenge can be reduced, given that the population is differently affected, depending on numerous factors. In order to answer to this question, we initiated some explanatory research, which started from the concepts of disinformation phenomenon and the existing measures to combat it. The conclusion of the initial documentation was that efforts to implement efficient measures to counter online disinformation can be supported by identifying personality traits and attitudes of Internet users that favor the acceptance and distribution of false content in the online environment (behavior defined as *permeability to disinformation*), based on which measures to combat disinformation could be adapted, according to the characteristics of each category of media consumers.

To achieve the research objective, we considered the following research questions:

Q1a: What individual traits determine an increased permeability to online misinformation?

Q1b: What are the life values of people susceptible to online misinformation?

Q2: What measures should be adopted to reduce the impact of online misinformation on the Romanian population?

To answer to the first question, we applied a quantitative research method (the opinion poll), using the questionnaire as a tool, and for the second question we used a qualitative research method (the interview), using the interview guide as a tool (Chelcea, 2022, pp. 129–141). Following the first research question, we developed a series of hypotheses to see if the predictors identified in the literature as determinants of susceptibility to conspiracy theories (independent variables) can also influence the permeability to disinformation in general (dependent variable). Previous studies (Bârgăoanu & Radu, 2018; Bennett & Livingston, 2018; Buturoiu et al., 2021; Graeupner & Coman, 2017; Greifeneder et al., 2021; Moundi, 2015; Puig et al., 2021; Roozenbeek et al. , 2022; Stanovich et al., 2010; Uscinski et al., 2020) identified information preferences in the online environment, public trust in people and institutions, and certain psycho-social traits.

In our research we tested the same factors in correlation with the permeability to online disinformation, as follows: socio-affective factors (news consumption habits, the strength of ideological motivations, trust in people and in Romanian and Euro-Atlantic institutions, respectively life values) and cognitive factors (intuitive thinking, myside bias, denialism, conspiracy mentality and belief in paranormal phenomena).

Thus, we tested the following hypotheses:

H1.1: The greater the consumption of social media news, the greater the permeability to disinformation.

H1.2: The greater the consumption of TV news, the lower the permeability to disinformation.

H1.3: The higher the consumption of radio news, the lower the permeability to disinformation.

H1.4: The greater the consumption of news from print media, the lower the permeability to disinformation.

H1.5: The higher the consumption of news from the online press/online news media (specialized web pages), the lower the permeability to disinformation.

H2: The stronger the ideological orientation, the greater the permeability to disinformation.

H3.1: The higher the trust in people, the lower the permeability to disinformation.

H3.2: The lower the trust in public institutions, the higher the permeability to disinformation.

H4: The more intuitive thinking is, the greater the permeability to disinformation.

H5: The more biased a person is, the greater the permeability to disinformation.

H6: The higher a person's level of denialism, the greater their permeability to disinformation.

H7: The more pronounced the conspiracy mentality, the greater the permeability to disinformation.

H8: The greater the belief in paranormal phenomena, the greater the permeability to disinformation.

Through a quantitative method (online questionnaire-based survey) we tested the above-mentioned predictors in correlation with a disinformation index - the Index of Permeability to Disinformation/IPD, adapted from a psychometrically validated indicator - the Misinformation Susceptibility Test/MIST barometer, developed by Maertens et al. (2021). IPD was built on a set of 10 news titles, from different activity fields, which were heavily shared in Romania and were verified by Romanian fact-checkers (AFP Romania, Antifake.ro, Dignitas.ro, Factual.ro, Veridica.ro). The respondents were asked to correctly identify the accuracy of 10 statements and were awarded one point for each correctly judged news headline. Thus, the scores recorded by the respondents varied between 0 (no sentences correctly identified) and 10 (all sentences correctly identified). In this way, an increased permeability to disinformation implied a low IPD score. Considering that new media is the main source of news accessed by users in Romania (Newman et al., 2023), only digital platforms, including social media, were analyzed.

A particular focus of our study was on the moral values of life, in order to identify the principles that determine human behavior in relation to the online media information. This

exploratory research was based on the value theory of S. Schwartz (1992), which "focuses on the meaning and content of human values", representing "a reference in the study of values at the international level" (Alaminos-Fernández et al., 2023).

In the questionnaire we used the value scale of Senge & Dilts (n.d.), taken from psychological tests for identifying personal life values. Completing this scale implied that from a set of 54 values, 10 important life values were initially chosen, from which only five were selected, and in the last stage only the three most important defining values were kept.

To answer to the second research question, I chose the interview method, through which I targeted the perceptions of some experts in public communication, people with a decision-making role in the educational system and journalists in Romania, regarding the necessary/opportune/feasible measures in combating online disinformation.

Through a transdisciplinary approach between communication sciences and behavioral psychology, we intend to establish some correlations between certain personality traits, on the one hand, and the degree of vulnerability to disinformation, on the other. An important premise in the present research is that cognitive errors (which increase the permeability to disinformation) are more present in certain types of people, depending on their psychological attributes. The purpose of this research is to identify measures adapted to each psychological pattern identified in our study. This study is a theoretical exercise. The design of such measures and their implementation are not possible without the agreement and involvement of social media platforms, which can transmit the right messages to each user in the online media, depending on their digital presence.

A novelty of the research is the analysis of the population in the sample according to the generations identified in Romania, who differ from those in other geographical areas as a result of the specificity of the Romanian environment, different from the American or Western one where most studies come from. Răducu (2022) identified five generations in Romania according to the "devices available in homes during the formative years" and the "main events related to different communication and information devices". For our research, we chose these categories of generational cohorts, because the "five media generations that interact in society represent different audiences for the devices that are part of their media diet". These are, according to the years of birth: Radio-TV generation (1937-1954), TV-PC generation (1955-1969), PC-Mobile-Net generation (1970-1988), Net-Mobile generation (1989-1999) and the Smart generation (2000-present).

Our paper is structured in four chapters, three of which explain the theoretical concepts and one is dedicated to the research itself. *Chapter I* was dedicated to the presentation of various types of communication pathologies, inextricably linked to technological transformations. Thus, we reviewed the terms and phrases used in the last decade to describe the digital disinformation phenomenon. Throughout the paper I used the general term disinformation, to define all misleading information placed on the entire spectrum of veracity, intentionally disseminated or not, with various motivations, generating exacerbated emotions, created by humans or artificial intelligence, circulating in the online environment in different forms (visual and/or audio). For this research, we have chosen to delve into online disinformation only, considering that it is more difficult to monitor and regulate it, as compared to traditional media, namely TV and radio. In the online environment, opinions and stances are intensely polarized, primarily as a result of how social media algorithms filter information (Ghosh & Scott, 2018; Woolley, 2020). Thus, online platforms users are isolated in echo chambers, incompatible with each other, reinforcing their beliefs that the online topics are definitely on public agenda, and the information that they receive is accepted by most users. Thus, online disinformation has an increased impact compared to the traditional phenomenon, especially because the polarization of opinions in the online environment ends up being reflected in the offline environment as well. The spread of online disinformation is enhanced by artificial intelligence, which can falsify images and video materials, adding credibility to narratives whose dismantling is not as viral in the online environment. The effects of disinformation can manifest both on the personal level (through public policies rejection) and on the societal level (affecting public trust and democratic rights).

In *Chapter II*, I addressed the audience psychology, considering that the factors that predict an increase in the impact of misinformation are not only of digital (social media algorithms), but also psychological (cognitive errors and emotional reactions). Ecker et al. (2022) showed that the elements underlying false beliefs are formed through the same mechanisms that shape beliefs, and are cognitive factors and socio-affective factors. Cognitive factors include: intuitive thinking (lack of analytical thinking, rejection of debate), cognitive bias (ignoring new elements of knowledge regarding the quality of the information source and some evidence contrary to one's own beliefs) and acceptance of illusory truths (as a result of familiarity with the transmitted message, fluency and coherence with previous own ideas). The socio-affective factors are: the attractiveness of

information sources (preference for human sources if the shared ideas are similar to one's own or are considered important in their community), emotional factors (emotions conveyed by information and one's own emotional state), perspectives on the world (personal values and partisanship). A special form of disinformation is represented by conspiracy theories, which have a long history and which are based on a mix of cognitive and affective factors (conspiracy thinking). Its new importance lies in the widespread reach provided by social media, including instant messaging networks.

The measures intended to prevent or combat online disinformation were included in *Chapter III*, classified according to their initiators and distributors (direct or self-imposed legislative regulations), the content of the shared messages (fact-checkers) or audience (awareness campaigns on misinformation, media and information literacy/MIL trainings, positive inoculation/pre-bunking). Managing disinformation requires a multidisciplinary effort to limit its spread, so the integrated approach to this challenge was distinctively approached. The conclusion of this chapter was that citizens are differently affected by disinformation, meaning that they have different degrees of permeability to disinformation. Permeability to disinformation is the phrase used throughout the research to define the audience's degree of vulnerability to disinformation or disinformation susceptibility.

Chapter IV details the objective of the research, the research questions and the hypotheses to be tested, the methodology applied, as well as the findings and final conclusions. Thus, through an interdisciplinary approach, the causes of the high impact of online disinformation are explained, with an emphasis on establishing the psycho-social factors, characteristics of the Romanian audience, in order to correlate with the measures to prevent and combat this phenomenon.

Main findings

The quantitative research carried out to outline the profile of people susceptible to disinformation revealed anticipated, but also unexpected results. The expected results refer to partially or fully validated hypotheses – the increased level of online media consumption and trust in public institutions which determines high resilience to disinformation, as well as the high levels of biased attitude, denialism, conspiracy mentality and belief in paranormal phenomena which are the premises of an increased permeability to disinformation. Among the unexpected findings of the research is that middle-educated individuals who use social media for information showed an

increased resilience to disinformation. Another unexpected result of our research is the invalidation of the hypothesis regarding the increased resilience to misinformation through TV news consumption, which was based on US studies (Allen et al., 2020). The discrepancy could reside in the differences between Romanian and the US news broadcast on TV stations, in terms of accuracy. Also surprising was the invalidation of the hypothesis regarding intuitive thinking as a predictor of permeability to disinformation, contrary to previous research that found a connection between intuitive thinking and belief in conspiracy theories regarding COVID-19 (Ecker et al., 2022; Li et al. al., 2022). At the same time, high trust in people revealed low scores in identifying disinformation for the analyzed sample, contradicting the initial assumptions (Lessenski, 2021; Sindermann et al., 2021). This could be because a high level of trust in people could lead to choosing them as a source of information over authentic media channels, which would allow misleading, unverified information to be easily accepted. The invalidation of the hypothesis regarding the radio news consumption could be consistent with the inconclusive results of other similar studies, considering that this media category is not a preferred information channel of the population. At the same time, the lack of correlations between the permeability to disinformation and the intensity of ideological affiliation, in contradiction with previous studies (Uscinski et al., 2020), could be due to unclear boundaries between political parties in Romania, but also to opportunistic alliances between them, sometimes in contradiction with their ideological orientation, which does not allow a sedimentation of political beliefs towards a certain direction.

To conclude, in general, people vulnerable to disinformation do not inform from online media sources, they do not have intuitive thinking, they have a high trust in people and little trust in Romanian and Euro-Atlantic public institutions, they have biased attitudes and conspiratorial mentalities. The tested predictors confirmed permeability to disinformation, some throughout the entire population, others only on certain socio-demographic subcategories. Even though certain predictors do not significantly correlate with permeability to disinformation, all analyzed predictors were involved in a multiple regression model that explained approximately 30% of the permeability to disinformation – a value close to the maximum reached in social science models (the remaining 70% being individual factors).

The measures to combat disinformation mentioned by the interviewed experts showed a good knowledge of the steps taken at that time in Romania, especially in the areas in which they perform: governmental, academic, NGO, journalism. These measures were generally the same

(educational, corrective, legislative), specialized according to the professional field of the experts, which justified the research approach of three different fields of activity, tangential to the field of disinformation. According to the experts, the measures to prevent disinformation (pre-bunking ones) on the long term, which aimed at the increase in the audience resilience, were carried out mainly in the academic field through MIL trainings. On the other hand, the measures to combat existing disinformation (de-bunking ones), which aim for short and medium term effects (awareness campaigns, fact-checking activities) are mainly implemented by public authorities (in the first case), and by journalists or private entities (in the second case). Media regulation represents a separate category of measures to prevent the disinformation phenomenon, but also to sanction slippages in public communication. They need to be implemented by decision-makers at the national and the European level, as well as by entities with media control responsibilities.

The solutions offered by the experts covered a wide variety of approaches, some complementary and others overlapping, indicating a saturation of the number of participants in the interview. They discussed solutions to prevent and combat disinformation similar to the current measures implemented in Romania, but in a holistic, "interdisciplinary, transdisciplinary and interinstitutional" approach, as expressed by one of the experts. The features of the Romanian media space were contextualized (systemic deficiencies in the economic and social fields, communist traumas that predispose to censorship and stricter regulation). The solutions to solve the systemic problems in society were highlighted, almost unanimously, as primary causes of the population's orientation towards alternative news sources, where the media coverage is predominantly flawed. In shaping public policies, the experts emphasized the importance of strategic communication through state-funded media sources and social media influencers. Building the trust of the population was seen as a solution by promoting experts and making journalists responsible for inaccurate information.

The quantitative research, although it answers to the first research question, was carried out after the qualitative research due to the need to identify the characteristics of the public most affected by online disinformation, which should be primarily targeted by measures to combat the phenomenon. The final conclusion was that the need for correct knowledge is assumed by all the people in the research sample who completed the life values section, but everyone relates to it differently. Those who are resilient to disinformation look for answers in facts and rational arguments, while those susceptible to disinformation have a fast way of thinking through mental

biases that favor a conspiracy mindset and superstition. Nevertheless, the strategic communication measures of public decision-makers must not start from the premise that others are wrong.

Considering the traits and values of people susceptible to disinformation, the most suitable measures proposed by the experts to increase people's resilience, could be those in the pre-bunking area - psychological inoculation and media and information literacy, with an emphasis on developing critical thinking, in the long term. In the first case, psychological inoculation based on scientific facts and truths can create healthy knowledge and thus fill the void of the need to seek truth in questionable sources whose credibility cannot be verified. As for media and information literacy, it can contribute to the creation of media, digital and information skills, through which news can be verified. In addition, the development of critical thinking, based on logical reasoning, starting in school, can be beneficial not only to those trained, but also to their friends and family, through contamination. Although fact-checking activities contribute to the hygiene of the information space, the impact of these efforts on people susceptible to disinformation is still disputed. There are both researches that found the role of fact-checkers in revealing political candidates to the public opinion (Wintersieck, 2017), as well as the reduced effect on those with preconceived ideas or certain ideologies (Walter et al., 2020).

As for media regulation, while this measure might reduce the disinformation flow, it may reinforce the conspiratorial beliefs of those susceptible to disinformation. The development of a strong, credible and authentic media, on the other hand, which addresses topics of public interest, creating solid and factual knowledge for the population, could contribute more to the societal resilience, and, therefore, to those vulnerable to disinformation. Legal measures in this area should be seen not only as sanctions for influence operations in the public environment, but also as the premises for creating a financial support framework for media sources that align with journalistic ethics and signal media slippages.

The analysis of the subcategories of respondents, depending on their permeability to disinformation, highlighted that men's trust in the Government, justice and the Army increases their resilience, as compared to women. This could indicate the need to adopt measures targeting women, such as communication campaigns that promote public institutions. At the same time, considering that the denialism expressed by women can increase their permeability to disinformation, MIL measures can be adopted especially for this demographic category.

Regarding the age, correlations of medium intensity between biased attitudes and

permeability to disinformation for the respondents starting with the PC-Mobil-Net generation (born after 1970), could indicate the need to adopt measures aimed at this category and to address the issue of intolerance towards the opinions of others through MIL campaigns and debates of ideas. Also, the correlations between conspiracy mentality and permeability to disinformation for representatives of the PC-Mobil-Net (born 1970-1988) and Net-Mobil (born 1989-1999) generations would require psychological inoculation measures and consistent communication campaigns, periodically held on current topics that respond to the need for knowledge of this socio-demographic subcategory. At the same time, the correlation of medium intensity between the belief in paranormal phenomena and the permeability to disinformation for those of the Net-Mobile generation could require the initiation of campaigns to promote scientific truths aiming this age group.

Depending on the residence, the strong correlation between the consumption of print media and the permeability to disinformation for people from the diaspora would require specific public messages to combat false narratives circulated at the national and international level, primarily through printed sources. Also, given the strong correlation between denialism and permeability to disinformation, exclusively for the diaspora, it might be necessary to create a campaign to promote the conclusions of scientific research on controversial topics on the public agenda. Regarding the distribution of the results of the quantitative analysis by education level, the medium-strength correlation between permeability to misinformation and belief in paranormal phenomena for people with average education might require the inclusion of scientific explanations for physical/chemical phenomena in media literacy programs. The importance this social category gives to intuitive thinking - a trait that, on occasion, can have positive valences, given their high scores on the IPD test of those who rely on this quality - could be positively exploited by expanding extracurricular knowledge during high school period, after which some part of the population drops out formal education.

Limits

For our study, we analyzed a conventional sample of Romanian citizens, and the hypotheses tested were based on research carried out in Europe or in the US. Consequently, the findings are characteristic to the Romanian population, making the research Eurocentric. In addition, the topical theme of the research and the rapid evolution of the online disinformation

phenomenon may cause certain theoretical aspects to be omitted, and the research may have overlaps with similar studies.

At the same time, the news headlines of the Index of Permeability to Disinformation were arbitrarily chosen, with the possibility of recording different results on other types of news. It is also possible that certain topics were better documented by respondents, but this risk could be mitigated by expanding the sample size and ensuring the representativeness of the research population. In the research process, some difficulties arose related to reaching a large and diverse number of respondents to ensure the representativeness of the sample in the targeted population. Being an unconventional sample, a balance could not be ensured between the categories of respondents analyzed. The relatively small number of participants in the quantitative research and from categories that are more homogeneous than representative of the Romanian population may represent a limit of the empirical research carried out. The categories of people with medium education (approximately 15% of the sample) or from the diaspora (3.6% of the sample) participating in the questionnaire are particularly targeted, given that some correlations targeted precisely this category of respondents.

Another limitation of the research is the length of the questionnaire, which required a relatively long time to complete, 15-20 minutes, which reduced the respondents' willingness to participate in the survey or to complete it entirety. At the same time, not including a control question to test the seriousness of the answers could raise certain questions regarding the attention paid to the questions by the respondents.

Regarding the qualitative research, the variety of expert opinions expressed in the interviews on the topic of disinformation could be restricted by the fact that they were chosen based on ideological proximity and availability. On the other hand, the speed of events in the public space could make certain measures to combat disinformation not visible and, implicitly, not addressed. Also, distance in time between conducting the interviews and publishing the findings could make some aspects out of date.

Relevance

Notwithstanding the limitations stated above, the exploratory method of creating a model of the most vulnerable person to disinformation makes this scientific approach unique. Also, the appeal to the life values as predictors of the permeability to disinformation represents a new

approach that was not found in the social sciences English literature. This could open new opportunities for further research on the disinformation phenomenon.

At the same time, the Index of Permeability to Disinformation/IPD, adapted from the MIST model (Maertens et al., 2021) and introduced in the present research, is an original approach, specific to the Romanian public space, even if it could be enhanced with other types of narratives. The correlations of the IPD with variables from the psycho-social field represent cutting edge findings in the social sciences research, as it tackles the phenomenon of online disinformation in a transdisciplinary manner.

Regarding the qualitative research, the experts' opinions on the phenomenon of disinformation fill in the gaps in the knowledge of existing measures to prevent and combat disinformation in Romania, update the existing data in previous studies.

Our research further the knowledge of the current information environment, with a focus on the existing communication pathologies and the measures meant to strengthen the societal resilience towards online disinformation. In this context, the final findings could be transposed to similar studies conducted in other cultural-geographic areas. The practical relevance of this research lies in the possibility of using its results in MIL approaches and public awareness campaigns. This could enable institutions to deliver well-tailored messages to target audiences in order to increase societal resilience, defined as "the ability of communities to flexibly limit major disruptions and recover quickly from the inevitable decline of their core functionalities" (Elran, 2017, p. 301). Artificial intelligence, used in the spread of online disinformation, could be exploited in tailoring measures to prevent and combat this phenomenon, similar to Google Ads which are present in social media users' news feed, based on their digital fingerprint.

Considering the target population of the research (Romania) and the selected conventional sample (Romanian citizens), the gathered results will contribute to a more nuanced understanding of the effects of online disinformation in similar states in Eastern Europe, as the research is focused on this geographical area. Also, the profile of people permeable to disinformation could be extrapolated only in the European area, as worldwide online disinformation may aim different goals.

Future research

Starting from the limits of the research and from its relevance, certain research directions can be outlined, which take into account the uncovered niches, respectively academic and practical interests in the field of communication. Regarding the partially invalidated hypotheses, they could be explored more carefully by expanding the sample in significant proportions on each category of respondents. In addition, research could be continued to identify other predictors of the permeability to disinformation, also in larger samples and better represented on each category of socio-demographic moderators. Thus, the correlations on certain socio-demographic subcategories between certain predictors that were not found in the regression model and the permeability to misinformation could represent hypotheses to be tested on representative samples from the Romanian population. Also, a possible future direction of research could be to investigate the role of people from the diaspora in disseminating misleading content, compared to those of the same nationality in the country, given the strong correlations between the permeability to disinformation, on the one hand, and denialism, conspiracy mentality and the consumption of print media news, in this demographic category. At the same time, it would be necessary to analyze the role of intuitive thinking in identifying the accuracy of the narratives in the public space, considering the research conclusions, which contradicted the results of other studies (Puig et al., 2021; Roozenbeek, Maertens, et al., 2022). In perspective, the Index of Permeability to Disinformation, specific to the Romanian online space, could be periodically updated according to the most viral messages in the online environment, fact-checked in Romania. Among the contents dismantled by them, it will be possible to maintain 10 texts shared on Facebook digital platform, with a high number of interactions. Based on the respective texts, it will be possible to formulate questions addressed to Facebook users in the sample, through which they will have to appreciate, with answers on a Likert-type scale from 1 to 5, the degree of veracity of the respective narratives. The accuracy of the messages could be rated on a five-point veracity scale: 1-false, 2-unlikely to be true, 3-can't tell whether it's false or true, 4-likely to be true, 5-true. Later, the fidelity of the scale could be determined by applying specific procedures (test-retest, parallel tests, halving the tests) (Chelcea, 2022, pp. 126–128) or with the help of the Cronbach alpha coefficient. The correct answers will be established by an extended team composed of several fact-checkers and/or communication experts.

Technological developments and media changes require the updating of solutions to increase societal resilience against online disinformation. Thus, the qualitative research could be repeated with the same communication experts, as well as with other exponents in the field, to identify the perceptions regarding the measures to combat online disinformation, implemented at national level, as well as new solutions to strengthen societal resilience.

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