European Digital Media Observatory

D.10 Periodically updated description of the DSI efforts to support and facilitate the coordination of academic research

M18

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1.0 Introduction

This is the third of five periodically updated descriptions of the DSI efforts to support and coordinate academic research in Europe (D.10) related to Task IV in EDMO. The deliverables are due every six months through the duration of the project period and provide an overview of current and recent efforts undertaken by the DATALAB - Center for Digital Social Research at Aarhus University to support and coordinate academic research on European digital disinformation. Furthermore, the reports will provide a brief overview of trends in recent academic work as well as a quantitative and qualitative assessment of the repository.

As part of Task IV, academic activities studying disinformation in the EU (IV.D.A) and relevant academic institutions and organisations (IV.MS.2) will be identified, listed and reached out to. The aim is to expand the research network of EDMO. Secondly, a repository of relevant academic research activities (IV.MS.1 & IV.D.C) and of relevant policy papers and other content (IV.D.D) are established and finalised and as researchers and organisations are further reached out to. This report will present the progress on these described tasks (Section 1), key topics in contemporary research on digital disinformation (Section 2), and evaluate the preliminary research repository (Section 3). The report covers months 13-18 of the EDMO project.

2.0 Support & coordination of academic research in Europe

In this section we summarise briefly the undertaken actions. The tasks are closely interrelated; the identification of relevant academic papers (IV.D.C) and policy papers (IV.D.D) guide our attention to new research organisations and institutions (IV.D.B) and academic activities studying the EU (IV.D.A). Similarly, researchers affiliated to the identified academic organisations and institutions may point our attention to academic work which should be added to the repositories.

2.1 Establishing the academic repository

By the time of the second D.10 report, a literary search had been conducted to identify relevant papers for the scientific repository. The search resulted in 2.021 papers that have

been manually coded based on their relevance to European digital disinformation at scale. After the initial filtering for relevance, the preliminary repository included 117 pieces of literature that have since been through an additional filtering process based on full-text assessment. After the second filtering the number of entries was reduced to 92. The main reason for excluding 25 papers was that the papers present mathematical models that are not tested on data while a smaller subset of papers were either not at scale or treated policy or media literacy related questions which is the scope of the other repository. The design of the search process as well as an in detail description of the relevance criteria is available in the "IV.D.A: Academic research on disinformation at scale in the EU" report.[1] The preliminary repository is publically available through the same link in footnote 1.

In the current state of the art the repository includes academic studies from different academic fields which shed light on various aspects of digital disinformation at scale. The findings will be elaborated further in section 3.0. The repository continues to be preliminary insofar as the repository will be periodically updated by periodic search updates via the Danish Royal Library website and based on the input from the identified researchers, who are encouraged to collaborate with EDMO to extend the research network further. For now all included papers are in English, however, at a later stage it will be possible to also include non-English studies. The aim is still that the final repository will include a minimum of 200 entries.

2.2 Extending the research network of EDMO

By the time of the first D.10 report initial steps had been taken to engage researchers in the EDMO project; DATALAB had held a workshop with researchers from Queensland University of Brisbane and identified three preliminary wishes for the Truly Media Platform which should: 1) make possible the extraction of dynamic lists, 2) provide clear documentation of where the fact-checked stories derive from and 3) offer additional information, i.e. engagement scores, name of debunker and fact-checking service. Before publishing the second report, DATALAB had finished the draft of the registration for researchers who wish to be an integrated part of the EDMO project, including the data, resources and activities. The

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[1]   https://edmo.eu/wp-content/uploads/2021/06/IV.D.A_-Academic-research-on-disinformation-at-scale-in-the-EU_Final.pdf

registration document has been reviewed internally within the EDMO Advisory Board and edited based on the comments and suggestions.

As the next step to extend the research network of EDMO and identify researchers' needs, an online survey has been drafted in the EUSurvey system, which will be distributed to researchers already identified in the project and the authors of the academic work included in the preliminary academic research repository. In order to extend the network further and to mitigate the risk of overseeing researchers active in the field of European disinformation, the receivers of the survey are encouraged to list research institutions and organisations they know to be studying digital disinformation and misinformation at scale in a European context. In this way we use the snow-balling method to expand the network further. Finally, the survey addresses questions such as the knowledge of EDMO, existing collaborations between fields and academic institutions/organisations, as well as the general interest in taking part in the EDMO project.

3.0 Relevant academic research

A vast amount of papers on digital disinformation continues to be published. In this section we highlight prevalent topics in research anno 2021. By the time of the first D.10 report, the main themes were terminology, COVID-19, fact-checking & fact-checkers, disinformation detection tools & methods and legislation, and in the second report detection, COVID-19 and the psychological effects of disinformation on humans were identified.

The updated search was conducted using the same search criteria as used for the scientific repository with an adjustment of the timeframe. Among the identified papers, we see recurrences of some of the identified themes from the first and second D.10 reports. The following five themes have been identified: COVID-19, disinformation detection tools & methods, political bias & susceptibility to disinformation, media literacy and fact-checks.

3.1 COVID-19

COVID-19 continues to be a prevalent topic in the health related research on disinformation. With the global coronavirus pandemic, the digital information landscape was influenced by

information of variating veracity, causing the WHO to announce an infodemic.[2] COVID-19 is an excellent case study and as time has passed, it is now possible to conduct studies with greater longitude and identify thematic patterns (Atehortua & Patino, 2021; Montesi, 2021), develop typologies for the harmfulness of false information surrounding the pandemic (Hansson et al., 2021) and to study the influence of misinformation on vaccine compliance (Montagni et al., 2021).

Atehortua & Patino (2021) analyse fake news messages shared on different social media platforms during the pandemic. The authors see a divide in the data between health-related and non-health related disinformation, i.e. religion, politics and so forth. The high prevalence of health related fake news can have fatal consequences for the individual and undermine health efforts. However, in an assessment of the danger of digital disinformation related to the pandemic, Montesi (2021) estimated that the fake news items in their analysis are not a danger to people's health or safety. Rather, the harm is described as intangible and moral. The data used in the study originates from the Spanish website Maldita.es and a content analysis shows that here the dominating theme is society, i.e. fake news targeting public figures or companies, followed by politics and science (Montesi, 2021).

Also focusing on the danger of disinformation, Hansson et al. (2021) set out to create a typology of harmful information circulating in Europe in the first three months of the pandemic based on six European countries: France, Italy, Norway, Finland, Lithuania and Estonia. The researchers identify the following six ways in which disinformation can cause harm: "(1) by discouraging appropriate protective actions against catching/spreading the virus, (2) by promoting the use of false (or harmful) remedies against the virus, (3) by misrepresenting the transmission mechanisms of the virus, (4) by downplaying the risks related to the pandemic, (5) by tricking people into buying fake protection against the virus or into revealing their confidential information, and (6) by victimising the alleged spreaders of the virus by harassment/hate speech" (Hansson et al., 2021, p. 380).

Exploring one of the possible consequences of the infodemic, Montagni et al. (2021) investigate the link between COVID-19 vaccine compliance, health literacy and the ability to detect fake news. The study suggests a correlation between the ability to detect fake news and the intention to accept a vaccine. Hence, a possible measure to counter the impact of

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[2] https://www-who-int.ez.statsbiblioteket.dk:12048/health-topics/infodemic

disinformation could be to enforce media and health literacy initiatives. In a survey study, Marco-Franco et al. (2021) found that civilians' main concerns regarding the vaccine are the possible side-effects. This concern causes hesitation but not straightforward resistance. According to the respondents, citizens prefer educational and proactive interventions to promote vaccines rather than compulsory vaccination and control of information platforms (Marco-Franco et al., 2021).

3.2 Disinformation detection tools & methods

Disinformation detection models and their improvement continues to be topics of interest for researchers as seen in the two previous reports. Early detection is crucial, as exposure to disinformation may have an impact on our ability to choose appropriate health practices (Hansson et al., 2021) or undermine democratic processes (Lamprou et al., 2021).

Overall, there are two ways of detecting disinformation; the first is by manual detection and debunking of the misleading stories, whereas the second is automated computer based detection. Due to the sheer volume and velocity of disinformation production, automated detection techniques are vital and a highly collaborative field between linguistics and computer scientists (Braşoveanu & Andonie, 2021). Detection models are trained to enable detection of abnormalities in datasets and the improvement of existing models continues to be a focus for researchers (e.g. Alonso et al., 2021; Braşoveanu & Andonie, 2021), e.g. by implementing sentiment as a characteristic to discriminate fake news from conventional use.

Thus far, detection research has focused on a specific language, predominantly English (Chu et al., 2021). However, language specific models have clear limitations i.e. English based models are optimised for detecting fake news created by English speakers and followingly, are not optimised for non-native English or other languages. Chu et al. (2021) focus on the most effective textual features in fake news detection and investigate the possibilities of transporting existing models to cross-language datasets and hereby bridge the gap of neglected languages. The study shows that models trained on more inclusive languages, such as Chinese, perform better in cross-language detection in both English and Chinese. This is an interesting finding in a European context considering the variety of languages spoken across

member states. More research in this field could potentially pave the way for well functioning cross-language detection models.

Other researchers have continued to work language specifically on improving existing fake news detectors by adding linguistic discriminators of false and true content. Alonso et al. (2021) review the use of sentiment analysis for fake news detection. Among the various stylistic features characterising fake news, sentiment can be used to detect disinformation. Similarly, Braşoveanu & Andonie (2021) suggest a hybrid between disinformation machine learning techniques, semantics and natural language processing (NLP). The continued focus on combining NLP methods and machine learning underscores the interdisciplinary character of fake news detection as a research discipline.

3.3 Political bias & susceptibility to disinformation

Another topic that has received attention from researchers is whether political bias plays a role in fake news resilience, i.e. if recipients of dis- or misinformation are more likely to believe false information if it supports their own political views. Academic papers from 2021 have approached the topic from different angles, i.e. the influence of anti-government sentiment (Tandoc et al., 2021), differences between for and against Brexit voters (Greene et al., 2021) or the political divide between Portuguese right and left wing voters (Baptista et al., 2021).

Based on a survey study Tandoc et al. (2021) confirm their hypothesis that political bias plays a role in resilience to disinformation as anti-government sentiment correlates with a higher tendency to accept anti-government fake news as true. Similarly, Greene et al. (2021) find that political bias plays a role in misremembering Brexit. On a sample of leave and stay supporters they tested fake news stories favoring both sides and respondents were more likely to remember narratives in line with their political conviction. Other than political bias, both studies find that cognitive ability plays a role for their competence to detect or recognise fake news.

However, results for the influence of political bias are not conclusive across all studies. Baptista et al. (2021) find that Portuguese right-wing voters are more likely to accept and disseminate fake news compared to left-wing or center voters regardless of whether the fake news item supported their political conviction or not. Differences in resilience may instead be

explained by their level of education, cognitive ability or other demographic characteristics such as their age. Older and lesser educated respondents were rated more likely to disseminate disinformation regardless of political ideology (Baptista et al., 2021). In an earlier study, Pennycook & Rand (2019) have found similar results as performance on a Cognitive Reflection Task (CRT) and not political bias, correlated with the ability to accurately identify false news based on which they conclude that susceptibility to disinformation is caused by lazy thinking.

3.4 Media literacy

As is clear across all studies in the previous section, cognitive ability seems to play a part in people's competence to detect fake news. In line with this idea a body of research focuses on developing media literacy initiatives. Scheibenzuber et al. (2021) investigate the design of fake news literacy training on German undergraduate students in a problem based online course. The intervention involved problem-based learning, and the findings of the study suggest it as a successful means to increase media literacy.

De Jesus & Hubbard (2021) develop a simple educational program aimed at upper elementary students' media literacy. The intervention consists of making the students reflect on what fake news is, why they should care about it and how it affects people and institutions. Questions are discussed in groups and presented for the class. The design is not tested. Overall, future research could undertake the task of testing and developing these initiatives on media literacy.

3.5 Fact-checks

The rise of digital media has created a loss of control and changed the dynamics of conventional news distribution (López-Marcos & Vicente-Fernández, 2021). Hence, fact-checking has gained an increasingly important role in modern journalism. One of the core differences in the information landscapes of the digital era and analogous news is that the audience are now more proactive in the dissemination, especially on social media (López-Marcos & Vicente-Fernández, 2021).

López-Marcos & Vicente-Fernández (2021) compare fact-checking agencies in the UK and Spain, two countries with different media systems (liberal model and polarised-pluralist model respectively) during events that have spiked disinformation, i.e. the Brexit campaign and the ongoing question of Catalonian sovereignty. The comparative study shows differences in the business model, Spanish fact-checking agencies are non-profit while two out of four studied agencies in the UK require a subscription for full service. Moreover, the topical focus varies as Spanish fact-checkers correct both national and international news while British fact-checkers focus on topics of national interest.

López-García et al. (2021) make a dual contribution consisting of a content analysis of debunks by the Spanish fact-checking platforms Maldita and Newtral as well as a survey study of the fact-checkers involved. The study is conducted during both a state of alarm and a calmer period of the COVID-19 pandemic. The analysis shows that the fact-checking activity increases during state of alarm as well as the complexity of the misinformation.

4.0 Assessment of scientific repository

Besides this identification of research trends, Aarhus University establishes a repository of relevant scientific articles in collaboration with ATC (IV.D.C & IV.D.D). The repository indexes important research conducted in the field of disinformation in digital media within Europe at scale. As mentioned in section 2.0, a preliminary repository has been created and made available on the EDMO website. The repository is still preliminary as it will be extended based on periodically updated searches on the Danish Royal Library as well as on input from researchers getting in contact with EDMO as the research network is extended.

Quantitative assessment

In its current state, the repository includes 92 papers which is lower than the goal of 200 entries in the final repository. This is due to the sharp focus on European digital disinformation at scale, that will be reevaluated if the final repository does not meet the requirement of 200 relevant entries. However, an evaluation of the preliminary repository shows an increase in studies meeting our search criteria from five in 2015 to 41 in 2020. If this tendency continues, the repeated searches will return more relevant results to include in the repository which will

bring the number of entries closer to 200. Furthermore, the repository will be extended based on input from identified researchers and by including papers in other languages than English.

Qualitative assessment

The preliminary repository covers a large range of different academic fields with Computer Science & Information studies as the dominant discipline with 58 contributions, followed by the Social Sciences (14) and Communication & Media Studies (13). A possible explanation for this finding is that the inclusion criteria "at scale" favors computer scientists who have the competencies and tools required to extract and analyse large datasets. As for the Social Sciences, the interest can be explained by the fact that disinformation has a large impact on various aspects of society and the political system. For example, fake news has been an especially popular term since the 2016 US Presidential Campaign. Finally, Communication & Media studies are probably well-represented due to the focus on digital media and the close link between fact-checking and journalism and their contribution to communication studies.

The current version of the repository shows a good representation of researchers across Europe. Researchers are affiliated with universities in Italy (24), Spain (12), Netherlands (11), Germany (9), Greece (5), Poland (5), Slovakia (4), Portugal (4), Austria (3), Denmark (2), Belgium (2), Czech Republic (2), Sweden (2), Romania (1), Australia (1), Bulgaria (1), France (1), Cyprus (1)[3]. Also outside the EU borders, researchers have shown interest in European digital disinformation: UK (18), USA (7), Switzerland (5), Canada (4), Brazil (2), Norway (1), Singapore (1), China (1), Russia (1), Israel (1) and Qatar (1). We estimate that the preliminary findings suggest a fertile ground for collaborations. Of the 92 included studies, 54 are conducted in collaboration between two or more authors across institutions and 28 studies are conducted by researchers located in different countries.

With regards to the country of interest, Italy (14) and the USA (13) are the most studied countries. The high prevalence of USA focused studies even in a search optimised for European results, speaks to the amount of attention the country has received. That said, the largest proportion of studies are non-country specific (55). A possible explanation for this is that the data used is extracted from social media platforms without country specific settings.

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[3] The number in the parenthesis marks the number of entries for the country.

Overall, there is a good representation across the European member states, however, 19 out of 27 EU countries are exclusively represented in cross-country studies.

Finally, we will address the main data sources as well as the recurrent themes in the repository. Social media platforms are the most used data sources, especially Twitter which is used by one third of the studies. Facebook is the second most used data source, followed by digital news. An assessment of the specific focus of the papers shows that health is a frequently studied topic within the field of digital disinformation. Here the literature shows a divide between before and after the COVID-19 pandemic, as the infodemic marks an important and popular case study for many scientists from 2020 onward. As mentioned earlier, the most represented field of research is Computer Science & Information Studies, which is also reflected in the topics explored, i.e. detection, classification and diffusion are frequently studied topics as well as natural language processing.

5.0 References

Alonso, M. A., Vilares, D., Gómez-Rodríguez, C., & Vilares, J. (2021). Sentiment Analysis for

Fake News Detection. *Electronics*, *10*(11), 1348.

https://doi.org/10.3390/electronics10111348

Atehortua, N. A., & Patino, S. (2021). COVID-19, a tale of two pandemics: Novel coronavirus

and fake news messaging. *Health Promotion International*, *36*(2), 524–534.

https://doi.org/10.1093/heapro/daaa140

Baptista, J. P., Correia, E., Gradim, A., & Piñeiro-Naval, V. (2021). The Influence of Political

Ideology on Fake News Belief: The Portuguese Case. *Publications*, *9*(2), 23.

https://doi.org/10.3390/publications9020023

Braşoveanu, A. M. P., & Andonie, R. (2021). Integrating Machine Learning Techniques in

Semantic Fake News Detection. *Neural Processing Letters*, *53*(5), 3055–3072.

https://doi.org/10.1007/s11063-020-10365-x

Chu, S. K. W., Xie, R., & Wang, Y. (2021). Cross-Language Fake News Detection. *Data and

Information Management*, *5*(1), 100–109. https://doi.org/10.2478/dim-2020-0025

De Jesus, I. Q., & Hubbard, J. (2021). Media Literacy for Elementary Education Students:

Inquiry into Fake News. *The Social Studies*, *112*(3), 136–145.

https://doi.org/10.1080/00377996.2020.1841717

Greene, C. M., Nash, R. A., & Murphy, G. (2021). Misremembering Brexit: Partisan bias and

individual predictors of false memories for fake news stories among Brexit voters.

Memory, *29*(5), 587–604. https://doi.org/10.1080/09658211.2021.1923754

Hansson, S., Orru, K., Torpan, S., Bäck, A., Kazemekaityte, A., Meyer, S. F., Ludvigsen, J.,

Savadori, L., Galvagni, A., & Pigrée, A. (2021). COVID-19 information disorder: Six

types of harmful information during the pandemic in Europe. *Journal of Risk Research*, *24*(3–4), 380–393. https://doi.org/10.1080/13669877.2020.1871058

Lamprou, E., Antonopoulos, N., Anomeritou, I., & Apostolou, C. (2021). Characteristics of Fake News and Misinformation in Greece: The Rise of New Crowdsourcing-Based Journalistic Fact-Checking Models. *Journalism and Media*, *2*(3), 417–439. https://doi.org/10.3390/journalmedia2030025

López-García, X., Costa-Sánchez, C., & Vizoso, Á. (2021). Journalistic Fact-Checking of Information in Pandemic: Stakeholders, Hoaxes, and Strategies to Fight Disinformation during the COVID-19 Crisis in Spain. *International Journal of Environmental Research and Public Health*, *18*(3), 1227. https://doi.org/10.3390/ijerph18031227

López-Marcos, C., & Vicente-Fernández, P. (2021). Fact Checkers Facing Fake News and Disinformation in the Digital Age: A Comparative Analysis between Spain and United Kingdom. *Publications*, *9*(3), 36. https://doi.org/10.3390/publications9030036

Marco-Franco, J. E., Pita-Barros, P., Vivas-Orts, D., González-de-Julián, S., & Vivas-Consuelo, D. (2021). COVID-19, Fake News, and Vaccines: Should Regulation Be Implemented? *International Journal of Environmental Research and Public Health*, *18*(2), 744. https://doi.org/10.3390/ijerph18020744

Montagni, I., Ouazzani-Touhami, K., Mebarki, A., Texier, N., Schück, S., Tzourio, C., & the CONFINS group. (2021). Acceptance of a Covid-19 vaccine is associated with ability to detect fake news and health literacy. *Journal of Public Health*, fdab028. https://doi.org/10.1093/pubmed/fdab028

Montesi, M. (2021). Understanding fake news during the Covid-19 health crisis from the perspective of information behaviour: The case of Spain. *Journal of Librarianship and*

Information Science, *53*(3), 454–465. https://doi.org/10.1177/0961000620949653

Pennycook, G., & Rand, D. G. (2019). Lazy, not biased: Susceptibility to partisan fake news is

better explained by lack of reasoning than by motivated reasoning. *Cognition*, *188*,

39–50. https://doi.org/10.1016/j.cognition.2018.06.011

Scheibenzuber, C., Hofer, S., & Nistor, N. (2021). Designing for fake news literacy training: A

problem-based undergraduate online-course. *Computers in Human Behavior*, *121*,

106796. https://doi.org/10.1016/j.chb.2021.106796

Tandoc, E. C., Lee, J., Chew, M., Tan, F. X., & Goh, Z. H. (2021). Falling for fake news: The role

of political bias and cognitive ability. *Asian Journal of Communication*, *31*(4), 237–

253. https://doi.org/10.1080/01292986.2021.1941149