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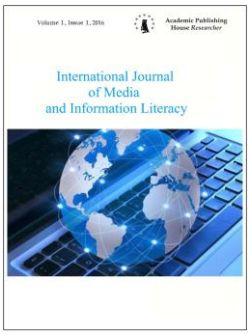

A Study into the Skills of Using Data Verification Tools as a Media Information Literacy Instrument for University Students

Andrii E. Lebid [a, b, *], Sergey I. Degtyarev [a, b], Lyubov G. Polyakova [b, c]

[a] Sumy State University, Ukraine
[b] International Network Center for Fundamental and Applied Research, Washington, USA
[c] Volgograd State University, Volgograd, Russian Federation

Abstract

Amid information wars and growing populism, when manipulation, propaganda and disinformation appear to be a natural focus, when officials, opinion leaders and media communicate unsafe and unverified information, when only up to 20% of messages can be marked as veracious, it becomes essential to develop critical and meaningful information consumption. The self-explanatory statistics, provided by fact-checkers, speak volumes and inspire those who have command of the investigation method in the fact check format to fully leverage it both in their professional activities and in daily lives.

The paper structures and classifies the key aspects of fact-checking, identifies its specific characteristics and effects, and sketches out the future outlook for its use as a new media trend. The work defines central objectives of fact-checking investigations and what differentiate them from conventional investigations. It has been revealed that fact-checkers are gradually shifting their field of activity to the plane of the so-called "unofficial sources" of information, such as social networking websites, public narratives and discourses, media materials of diverse origin, etc.

The findings of the study conducted demonstrate a correlation between the general media literacy, which respondents evaluated as rather low – average and below average and the need for its end-to-end improvement, including through interactive media practices, trainings and projects. The study concludes that respondents are actually ignorant of the fact-checking and data verification tools available. We believe the fact is also immediately linked with the overall level of media maturity and respondent information literacy, levels of critical and analytical thinking, and the ability to work on information and its sources.

Keywords: media literacy, fact-checking, data verification, fake, post-truth, manipulation, media trend.

1. Introduction

Over a relatively short span of time, fact-checking has evolved from an investigative journalism tool into a media trend with its one-of-a-kind features, structure and data verification methodology. The change can be confirmed by the fact that nearly 150 media worldwide operate exclusively as fact-checkers. Their cumulative effort generates a tremendous volume of fact-check investigations so that they are able to compete with conventional media (in news, analytics and other), have a constant audience outreach and maintain the status of an expert medium.

* Corresponding author
E-mail addresses: a.lebid@socio.sumdu.edu.ua (A. Lebid)

Significantly, most of the global fact-checking resources are concentrating their energy on verifying facts and information contained in official statements, news reports, public narratives, etc.

To consolidate and support the activity of fact-checking resources, the Poynter Institute established the International Fact-Checking Network based in the United States, the country where the media market is serviced by the bulk of fact-checkers.

The progression of fact-checking resources has been greatly boosted as today's digital technology is increasingly pervading our lives, multiple unstructured and structured databases and data sets are becoming available, and registers and libraries are going digital. This has substantially simplified and accelerated both their search and data verification, and contributed to a broader range of better information verification and identification tools that can be utilized without a required special qualification.

Speaking of Ukraine, the domestic media landscape is currently featuring several fact-checking platforms – BezBrehni, VoxCheck, StopFake, Slovo I Dilo. Some media, e.g. DW Ukrainian, run regular fact-checking sections; others launch a dedicated fact-checking block for specific events, for example, elections, COVID-19 action and more.

Importantly, despite a fairly large number of fact-checking resources, the aligned work rules and principles and the general fact-checking methodology is unique to each country and is determined by policies, social environment, culture, mindset, values and other factors.

2. Materials and methods

When writing the manuscript, we conducted student surveys designed to find out how the group assesses their general media literacy, knowledge of main fact-checking principles and skills in handling data verification tools. Answers were received via the group chats polling system on Telegram and online polling platform on Google-forms. The results obtained were compared with the findings in the study we carried out in the 2020 spring semester.

The methods employed include statistical analysis of quantitative research data, statistical data processing methods, notably the calculation method for the Pearson correlation coefficient.

3. Discussion

Today's politically and economically unstable world produces a plethora of information that needs verification. This will help put the situation in perspective and prevent the spread of falsehoods (fakes). Issues related to various aspects of fact-checking techniques are taking center stage in the academic community.

For example, M. Amazeen examines structural factors influencing the global emergence of fact-checking. She understands fact-checking techniques as a democracy-building tool. The very emergence of fact-checking is linked with a decline in journalism, easy access to technology for the masses, and socio-political strife (Amazeen, 2017).

American and Israeli researchers N. Walter, J. Cohen, L. Holbert, Y. Morag looked into how fact-checking affected political beliefs. They undertook a meta-analytic review to estimate the effectiveness of fact-checking in correcting political misinformation. The researchers' conclusion is that fact-checking has a significantly positive overall influence on political beliefs (Walter et al., 2020).

P. Mena examined the fact-checking-related issues as illustrated by the activity of political journalists in the United States. He studied the most widely accepted principles of fact-checking and topics of misinformation dependence on the activism of partisanship of politicians (Mena, 2019). Another facet of the above issue was reviewed by J. Jarman. He investigated into the influence of political affiliation and criticism on the effectiveness of political fact-checking (Jarman, 2016).

D. Margolin, A. Hannak, I. Weber chose to target the research lens at the political fact-checking on Twitter. They explored the social contexts in which truth may be more or less preferred, as well as the social connections between fact-checkers and rumor spreaders (Margolin et al., 2018).

A. Levitskaya, A. Fedorov analyzed the controversy of manipulation in the modern media landscape, showing that the manipulation techniques became more sophisticated and include mixing reliable and fake information. This, in turn, implies the use of more complex mechanisms to ban or remove false media information (Levitskaya, Fedorov, 2020).

E. Humprecht proceeds in her research from the argument that fact-checking can only be successful if it wins the trust of the audience. She carried out a comparative analysis of a number of

European organizations and agencies engaged in debunking false information. The researcher in particular discusses the implications of successful fact-checking to combat online disinformation (Humprecht, 2020).

P. Brandtzaeg, A. Følstad, M. Domínguez, as part of a three-year European Union research project (REVEAL), tried to investigate how journalists and the public perceive the services for verifying fact accuracy and countering the spread of fake news in social media (Brandtzaeg et al., 2018). The researchers' new contribution was the finding that most journalists and social media users, while generally judging such services as potentially useful, still viewed them with a certain degree of ambivalence. W. Lowrey analyzes the emergence and development of news fact-checking websites. According to the researcher, such websites embrace elements of both traditional journalism and digital network logics (Lowrey, 2017).

Fact-checking practices, as a crucial component in a magazine's success, have been reviewed by S. Currie Sivek, S. Bloyd-Peshkin. The researchers suggest that the practices help magazines retain loyal readers, protect them from litigation related to falsehood publication, and bring other benefits (Currie Sivek, Bloyd-Peshkin, 2019).

British researcher J. Singer considers fact-checkers as innovators and entrepreneurs. Her findings indicate that many of them see their role not only as extending traditional journalism, but also as correcting some of its drawbacks (Singer, 2019).

N. Krause, I. Freiling, B. Beets, D. Brossard linked the march of the 2019 coronavirus (COVID-19) to a surge of misinformation that poses a risk in its own right to people as its subject is associated with the pandemic. In this connection, the researchers have discussed implications of the COVID-19 misinformation fact-checking (Krause et al., 2020).

The study by U. Ecker, Z. O'Reilly, J. Reid and Chang Ee Pin should probably be defined as more applied research. Their paper "The effectiveness of short-format refutational fact-checks" made an attempt to pinpoint a specific most promising approach to fact-checking (Ecker et al., 2020).

There is little doubt a fact-checking process cannot be up and running without critical thinking skills. Earlier, we have made a series of efforts to analyze some aspects of the concern (Lebid, Shevchenko, 2020; Zavhorodnia et al., 2019), as the ability to think in a critical and system way empowers individuals to identify incongruities and interdependencies in media texts and media messages.

4. Results

Hence, fact-checking is a pre-requisite component and a fundamental principle of media and information literacy for every person who are conscious about the information they consume. A fact checker is inherently a motivated party of sorts, and therefore, it is his responsibility to verify information for manipulations, populism and inaccurate facts in statements and announcements of officials, public figures, opinion leaders, the media and others.

Based on this, the mission of fact-checking is more than mere revelations of falsehoods in public statements, it is also about establishing the veracity of the facts on which the statements are built, as well as uncovering manipulative tactics and populist claims.

To validate the veracity of such statements, fact-checkers should at all times utilize information from official government channels, acknowledged international organizations and expert comments with reference to original sources. No "insider information", biased opinions, forecasts, or estimates may appear in a fact-checker's reasoning and evidence.

A fact-checking resource should formulate and adopt clear rules for processing arguments, methods of collecting evidence and the logic of the investigation itself. The established public statement verification criteria should, in turn, be subject to civic scrutiny and oversight.

Depending on the statement area and topic, the fact-checker independently traces the information sources that provide data used to assemble the body of evidence. In the course of investigation, the fact-checking resource may engage international organizations and professionals and create working expert groups by inviting representatives of other information or analytical organizations.

The information accumulated and structured this way can be instrumental in delivering ratings of public figures, political parties, government officials, etc. Dissemination of such

information and ratings in the public space should be maximized to illuminate the real picture of manipulations and misinformation contained in government and public discourses.

Considering the above, it should be noted that any fact-checking resource has the right to scrutinize the statements of public figures as part of an open investigation using public sources. In this case, the basic qualities of fact-checking should be its targeted action, special approach to the use of sources, objectivity and non-partisanship. The targeted action implies not only answering the questions What? Where? When?, but also necessarily to the question – Why? What potential implications are there?

In essence, fact checking objectives can be boiled to the following:

- verifying facts and debunking their inaccuracy;
- establishing cause-and-effect relations between them;
- spotting indications of any manipulations;
- reconstructing and demonstrating a real picture of events;
- expanding knowledge and skills, improving the general culture of media and information literacy.

Importantly, revealing true cause-and-effect links, as well as manipulations around this efforts, is as equally significant as checking the facts themselves. Publications, messages, public statements very often announce real facts (or information as close to them as possible), but causes and effects between them are intentionally tampered to shape desired perceptions.

Fact checkers using data verification systems have many tools available to deliver quality investigations. Their toolbox features numerous sources of information to confirm or refute facts – ranging from technical means, insider contacts and official inquiries to open data sets and bases.

Unlike a typical investigation, a fact-checking action verifies data only by using open official sources, filing official inquiries and developing its own documentary database. It should be noted that drawing on open official sources completely prevents fact checkers themselves from manipulating facts and data, minimizing potential accusations of bias and partisanship.

On the other hand, the use of open sources for fact verification has certain constraints in terms of promptness as the process of formulating an inquiry, registering it, receiving a response from officials and so on may imply various procedural aspects. In addition, the information in possession of its owner is categorized as being restricted, and as a consequence its publication can be limited if at all allowed. Moreover, the disclosure can put another person's life or national security at risk. In such cases, you the cannot release the information.

Digital technology has substantially scaled up both the channels to promote information and the possibilities of its verification. This, as a result, has immensely augmented the consumer audience, as the growing number of people gain access to various sources of information, comparison opportunities and analysis tools. The negative implications of the trend can include the wider opportunities for abusive practices, influence techniques and public opinion manipulations.

The array of instances being reviewed has been extended over the recent time as fact-checking resources are increasingly focusing on:

- public statements made not only by officials, but also by opinion leaders;
- messages published not only in the media, but also on social networks;
- programs, strategies, plans, etc., released by power entities and officials;
- social narratives, stereotypes and myths;
- photo, video materials and more.

The methodology to check the instances has few variations with only difference in fact-checking mechanisms and tools.

Taking into account the above points, we carried out a survey among students of the Sumy State University (SumDU), to learn more about the situation around the skills the student-age population develops to work with data verification tools. The poll total coverage was 216 1-4 year students in all academic programs.

The purpose of the study is to measure the general level of students' knowledge of fact-checking and examine how they understand the principles of fact-checking application in educational and research work. In this context, we believe it will be revealing to compare the results of the current study with the findings of our earlier analysis of the level of student media and information literacy (Lebid, Shevchenko, 2020).

We developed control questions to compare the results obtained previously, and new questions to render the results more concrete (Table 1):

Table 1. Dynamics of respondents' general level of media literacy (SumDU)

	Spring semester, 2020		Fall semester, 2020	
	No. of people	%	No. of people	%
Evaluate their media literacy level as rather low	301	91.5	175	81
Do not know what fact-checking is	189	57.5	103	48
Do not verify information at all or hardly ever verify it	190	58	135	62.5
Believe it is necessary to develop and improve skills of media information literacy	311	94.7	204	94.5

Based on the control survey results, we suggested the following hypothesis: H_o is the number of respondents who believe the skills of media information literacy are a highly relevant asset, directly proportional to the number of respondents with below average media literacy. In statistical testing of a hypothesis, a null hypothesis is a type of hypothesis that proposes, for example, there is no relationship between groups or correlation between observed results.

With the χ2 calculator, we determined the number of degrees of freedom as equal to 3. The value of the χ2 chi-square was 3.418, and the critical value of χ2 at a significance level of $p < 0.05$ was 7.815. Significance level $p=0.33$ (Figure 1). The correlation between factorial and effective features is statistically insignificant with the significance level being $p > 0.05$. The result is not statistically significant as there are not enough arguments to reject the null hypothesis.

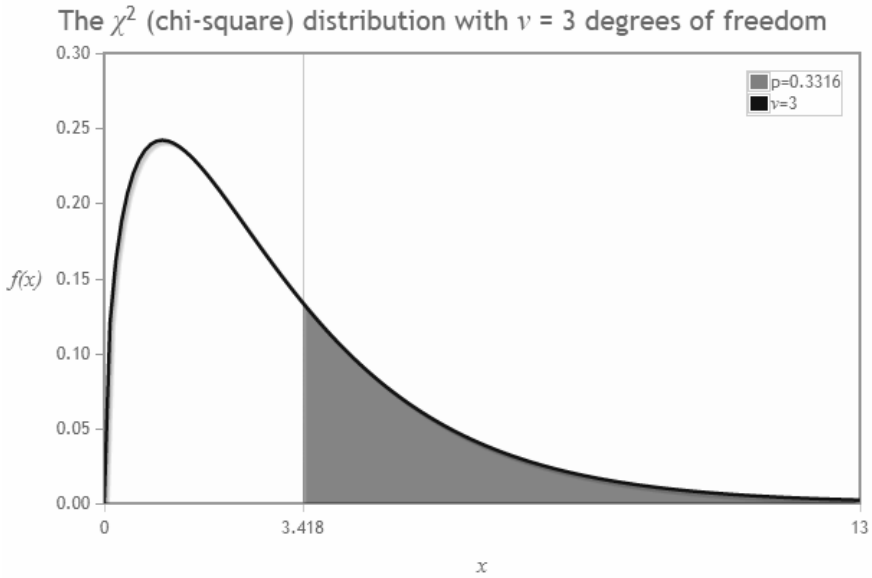

Fig. 1. The χ^2 distribution plot for calculated values

P-In statistical hypothesis testing, value (probability value) is a value used to determine the significance of the results obtained. Calculating the p-value helps determine the actual extent to which the observed results are likely to deviate from the null hypothesis. The smaller the p-value is, the greater the significance is and the more evidence exists that the null hypothesis should be rejected in favor of the alternative hypothesis. Typically, with $p \leq 0.05$, the value is considered as

being significant and the null hypothesis is rejected, while $p > 0.05$ indicates that there is not sufficient evidence against the null hypothesis to reject it.

When asked about their trust in the media, most respondents (57.9 %) answered that they gave more credit to the state-run media outlets (Figure 2), although the type of the media has a small share in the Ukrainian media market – the overwhelming majority of the media resources are private businesses.

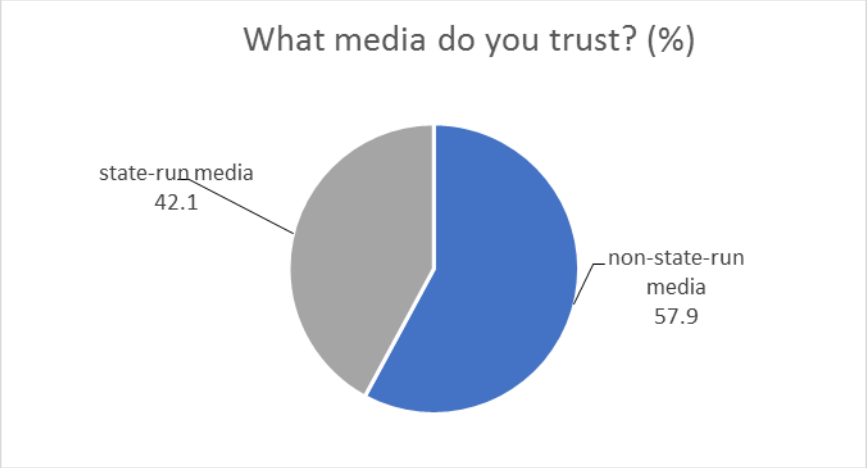

Fig. 2. Which media do you trust? (SumDU)

When asked about their reliance on certain sources of information, the students engaged in the survey pointed out that they had confidence in major online media outlets that, again, are mostly privately owned (Figure 3).

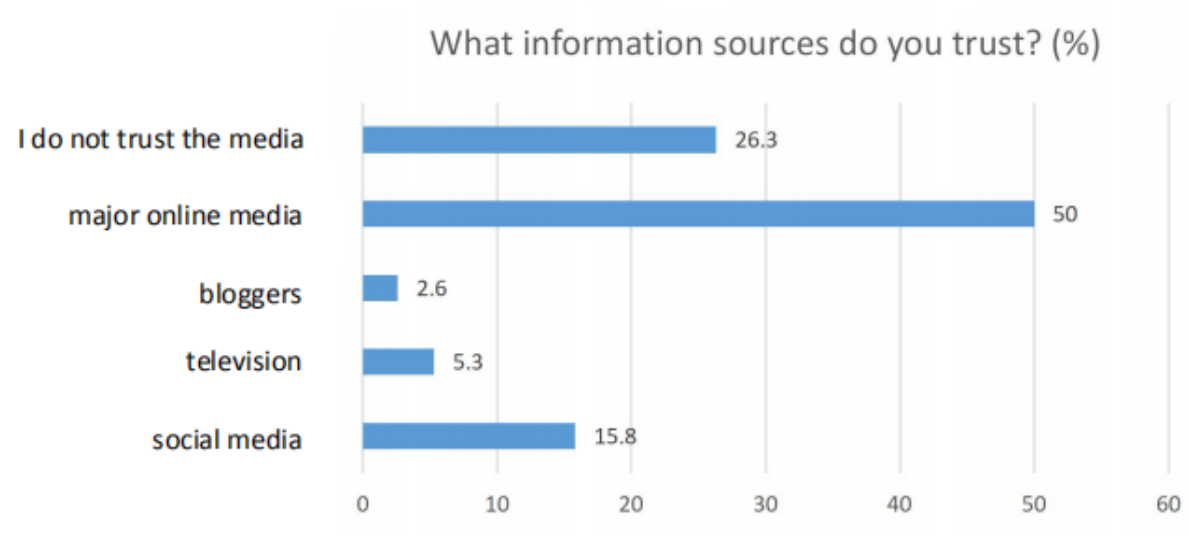

Fig. 3. What sources of information do you trust? (SumDU)

The figures show that the essential fact-checking rule – "Don't trust media" – is only followed by 1/4 of the respondents, which is in fact quite little. The situation is hardly surprising, given the number of those who are actually aware of the fact-checking procedure and verify information and its sources – these are about 1/3 of the entire respondent group.

5. Conclusion

Based on the above, we can postulate not only the fact of rather poor critical and analytical thinking skills, which one cannot overestimate in the information age, but also the low level of general media and information literacy. The finding is especially frustrating, as it characterizes the younger generation that has rather a low opinion of their knowledge and skills in the area.

In view of this, we should emphasize the need for systematic, targeted efforts to enhance the basic culture of media literacy and media hygiene, introduce fact-checking and data verification elements into academic courses, work with arrays of information and analyze its sources. We set the goal after we obtained the research results in the spring semester, and managed to fully accomplish it from the start of the new academic year, when after 5 months of intensive training, (April-May, September-November 2020) tangible results were achieved – the number of those who rated their media literacy rather low, as well as those who did not know how and could not work with fact-checking tools, albeit insignificantly, wend down.

On the other hand, the number of those who were not critical and did not verify information and its sources, increased although the growth was insignificant. This is an alarming signal that, in principle, can be explained by individual psychological and age qualities. An optimistic lesson learned is that the number of those who consider it necessary to develop and improve the skills of media information literacy is invariable, moreover, the number is invariably large. This inspires our confidence in the positive outcome of our work.

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