

**STUDYING THE META-ACCURACY FIRST IMPRESSIONS
IN THE PANDEMIC AND POST-PANDEMIC REALITY:
CHALLENGES AND OPPORTUNITIES PRESENTED
BY INTERNET RESEARCH**

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ABSTRACT

Aim. Studying first impressions meta-accuracy (how accurately we understand the first impressions others form about us) is central to enhancing the communication process. It typically requires experimental settings with at least minimal interactions between targets and perceivers. The COVID-19 pandemic has rendered face-to-face laboratory setups almost impossible. Fortunately, the Internet offers a virtual environment where the meta-accuracy of first impressions could be studied safely. We review the opportunities and challenges associated with the Internet study of meta-accuracy and make a call for action to address them.

Concept. In certain ways the Internet facilitates the study of first impressions meta-accuracy. It is simpler and faster online, compared to the lab, to look at first impressions in asynchronous settings, such as email and social media updates, where targets present themselves via images and/or text and perceivers later form impressions based on this information. The Internet research solution, however, also comes with an array of difficulties. Synchronous communication settings, where targets and perceivers exchange information without delay, (e.g., instant messaging), present three major types of challenges to study of first impression meta-accuracy – *conceptual* (e.g., differences between online and offline first impression situations), *technological* (e.g., implementation of chat applications in Internet surveys), and *policy-driven* (e.g., GDPR).

Conclusions. The opportunities and challenges presented by the Internet in the study of first impression meta-accuracy also apply to the larger field of studying human interac-

tion online. Discussing and addressing them has the potential to enhance Internet research tools and practices for the humanities and social sciences.

Keywords: meta-accuracy, first impressions, Internet, technology, policy, challenge

INTRODUCTION

Aim of the Paper

This paper is inspired by the authors' observations and experiences collected between April 2020 and May 2021 in the context of the research activities for the project MAFIO (Meta Accuracy of First Impressions Online), funded by the Bulgarian Science Fund (contract number КП-06-ДБ-3) and carried out at the Institute for Population and Human Studies at the Bulgarian Academy of Sciences. The main period for execution of the project coincided with the onset of the COVID-19 pandemic. Inevitably, most of the project research activities were affected in either positive or negative ways, or both, by the pandemic and post-pandemic shifts in societal order and human communication. Most notably, the research, which was planned to address a social psychology phenomenon in carefully controlled Internet, simulated Internet, and laboratory settings, had to be re-designed and executed entirely online. In this document we present the opportunities that became available, as well as the challenges we encountered in the course of the project. We discuss a couple of available solutions to some of the challenges and we make a call for action to address the most pressing issues through the development of a single research tool. We conclude by emphasising the contribution of such a solution not only for the study of first impressions meta-accuracy, but for any other research fields that are interested in human interaction.

To facilitate the understanding of the specifics of our Internet research opportunities and challenges, we begin by guiding the reader into the topic of first impressions meta-accuracy. We provide the basic definitions of the studied phenomena and outline the typical research paradigms in the field. Next, we move on to the changes in the research process associated with Internet research, which then guide us to our list of opportunities and challenges.

First Impressions

As a social species we interact with others on a daily basis. An integral part of the human communication process is the formation of first impressions about our interaction partners. In most basic terms, first impressions could be defined as the *initial conjectures* we make about other's physical and personality characteristics upon our very first mutual encounter.

First impressions are to a large extent *implicit* and *automatic*. They are formed *spontaneously* and *instantaneously*. Research has shown that as little time as 100 ms (Willis & Todorov, 2006), or even 39 ms (Bar et al., 2006), is sufficient for the generation of a first impression. First impressions are also remarkably *durable*. They can, for instance, predict impressions from a live interaction that takes place one

month after an initial exposure to a photograph of the target (Gunaydin et al., 2017). In addition, first impressions are very *powerful* as they not only influence and predict attitudes and behaviour on the individual level, but have been shown to be indicative of the outcome of crucial large-scale societal events such as political elections (Olivola & Todorov, 2010).

Due to their quick and automatic nature, their stability over time, and their power over subsequent behaviour, first impressions are essential to human communication. The importance of first impressions motivates the need to understand both the process of their formation and the validity of the process' outcome (i.e., the validity of the impression). Here we are primarily concerned with the impressions' validity or *accuracy*. Defining accuracy in person perception is a long-standing discussion in the literature and is beyond the scope of this paper. For our purposes it is sufficient to say that first impressions' accuracy may be a multi-faceted concept that consists of various components and is affected by multiple factors. For example, accuracy may incorporate the target's perception of themselves, the perceiver's impression of the target, the agreement of multiple perceivers about how they see the target, and the repeated measured behaviour of the target.

Meta-Accuracy of First Impressions

Our focus falls on the perspective of the impression target. In particular, we are interested in how the target thinks the perceiver see them. The accuracy with which one understands how others see them is referred to as meta-accuracy (Kenny & DePaulo, 1993). Understanding the meta-accuracy of first impressions is essential because the way we think others see us affects our attitudes and behaviour, and thus has the potential to influence the course and outcome of the entire communication process.

Traditionally, meta-accuracy of first impressions has been studied in the laboratory. In a typical experimental setup participants would meet for the first time in the lab and would engage in a brief interaction, after which they would be asked to share their impressions of one another, as well as their beliefs about how their interaction partners had seen them. In some setups participants would interact in dyads, in others they would interact in larger groups. A common design for the study of first impressions meta-accuracy is the round-robin where every member of the participant sample interacts with every other member. This design is especially resourceful, because it allows the collection of multiple dyadic observations with a relatively small number of participants, and makes it possible to estimate impression consensus across multiple perceivers for every target.

The key information to keep in mind for the purposes of this report is that the tradition of studying first impressions meta-accuracy has generally required face-to-face interaction and coordination in time and space of both experimenter and participant dyads and/or groups.

PARADIGM SHIFT FOR THE STUDY OF FIRST IMPRESSIONS META-ACCURACY IN THE PANDEMIC AND POST-PANDEMIC REALITY

Although even prior to 2020 a significant amount of human interaction was already taking place on the Internet, the COVID-19 pandemic caused a sudden transition of an even larger portion of our communication to the online world. With country- and, at some point, world-wide lockdowns many work-related, learning, and social activities needed to be done exclusively through the Internet. Now, from the perspective of May 2021, when the vaccination program is close to complete in many regions around the world, it appears that even though safety measures are slowly being relieved, many activities that became Internet-based during the pandemic outbreak will remain mostly Internet-based in the post-pandemic reality as well. The new predominantly online nature of human communication has affected both everyday life and science. From the point of view of the humanities and social science, it becomes especially intriguing to study the new dynamics of Internet-based human interaction.

Our primary interest is how first impressions are formed online, and, in particular, how to study their meta-accuracy. We must emphasise that the goal of the MAFIO research project was to study meta-accuracy online even prior to the pandemic outbreak. For example, we had envisioned laboratory setups with a simulated Internet environment in addition to online-based studies. However, with COVID-19 social distancing and other safety measures in place the traditional laboratory face-to-face setups were no longer feasible. Thus, the pandemic served a facilitator of Internet-related changes and thus stimulated the discovery of various opportunities and challenges in the study of first impressions meta-accuracy in the online world.

INTERNET RESEARCH OPPORTUNITIES AND CHALLENGES FOR THE STUDY OF FIRST IMPRESSIONS META-ACCURACY

Undoubtedly, Internet research tools and methodology facilitate to a large extent the collection and analysis of various types of human data (e.g., opinions, beliefs, behaviour, etc.). At the same time with recent technological and policy development, the collection and analysis of such data becomes less straight forward in certain respects than it was at the beginning of the Internet research era. Here we describe the positive and negative aspects of Internet research for one highly specific case of data – the meta-accuracy of first impressions. The collection and processing of this particular type of data requires human interaction of dyadic or group nature occurring over the Internet. Thus, we would like to emphasise that in some ways the advantages and disadvantages of Internet research may differ for first impressions meta-accuracy compared to other experimental settings (e.g., such that do not involve the participant interaction). Furthermore, we should point out that, as is often the case in life, things are not always strictly black-and-white and what may be viewed as an opportunity in one situation may become a challenge under different circumstances, and vice versa. To facilitate reading, we

have made an arbitrary distinction between opportunities and challenges based on their predominant value for our specific phenomenon of interest. Towards the end of the paper we discuss how these opportunities and challenges may change positions and be viewed differently.

OPPORTUNITIES

The opportunities that contemporary Internet research presents for studying the meta-accuracy of first impressions could most generally be classified into the categories of *convenience*, *time*, *technology*, and *costs* factors (Fig. 1). As is the case with offline research, these factors are typically found in a complex interplay with one another in the case of online first impressions meta-accuracy as well.

Convenience may concern both the experimenter and the participants, eliminating the need for them to commute and be physically present at the laboratory. Some previously laboratory-based experiment development software solutions now offer an online version (e.g., E-Prime Go, Psychology Software Tools, Inc., 2020), and there is currently an extensive number of Internet platforms dedicated to experiment building and hosting, such as Qualtrics (Qualtrics, 2021), SoSci Survey (SoSci Survey GmbH, 2021), Unipark (Questback GmbH, 2021), etc. Furthermore, participant recruitment is now incredibly fast and easy through platforms such as Amazon Mechanical Turk (Amazon, 2021), CloudResearch (Prime Research Solutions LLC, 2021), Prolific (Prolific, 2021), etc. Technological advancements like these and many more can be very affordable and make it possible for the researcher to program the experiment, recruit participants, and collect the necessary data remotely. In the pandemic and post-pandemic era executing the complete research process from a remote and safe location is essential. To further add to the convenience factor, data collected over the Internet is quickly and easily available in a digital easy-to-process format (e.g., Frączkowska, 2021), which has not been the case in classical laboratory face-to-face interaction research where data often need to be initially recorded on paper and later entered manually into digital spreadsheets suitable for analysis.

With increasing technological development and the related convenience of remote experiment execution comes a decrease in time commitment and costs. Without commuting to the lab and engaging in face-to-face interaction (necessary, for example, for greetings, obtaining informed consent, going over the instructions), time commitment is reduced both for the experimenter and the partici-

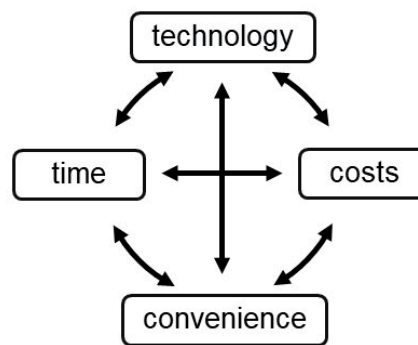


Fig. 1. Categories of opportunities presented by Internet research for the study of first impressions meta-accuracy.

Source: Own research.

pants. Moreover, the time factor becomes more flexible for online participants and, unless controlled by the experimenter for research-related purposes, allows the participants to move through the instructions and experiment sections at their own pace, thus alleviating some of the situational stress associated with laboratory-based situations.

Without expenditure for maintaining a laboratory environment (rooms, hardware, etc.) the costs associated with the experiment are reduced and available funds could be redirected for other research purposes such as increasing participant samples and thus also increasing statistical power.

The opportunities that Internet research presents for the study of first impressions meta-accuracy become most evident dyadic asynchronous (i.e., involving a time delay) situations. Such a situation may be the exchange of email or the update of a status on a social media platform. One person generates some content and another reacts to it after some time. Experimental situations featuring such interactions are fairly straightforward to set up in an online experiment. The experimenter programs the study and the participants follow the instructions and tasks at their own pace and convenience. Once the initial content is generated by the targets in the first phase of the experiment, the experimenter can set up the next phase where the content becomes available to the perceivers who react to it and form impressions. As we will see next, however, exchanges between participants become less trivial when they need to happen in groups and without the time buffer of asynchronous Internet communication.

CHALLENGES

The challenges we encountered in our study of first impressions meta-accuracy via the Internet in the pandemic and post-pandemic era could be classified into four categories, which, as in the case of the opportunities, are also in continuous interplay with one another. The challenge categories we identified relate to the *conceptualisation* of the studied phenomena, *technology*, *costs*, and *policy* (Fig. 2).

The challenges become most obvious in group and/or synchronous communication settings. While technological advancement facilitates the study of first impression meta-accuracy in dyadic interactions, the situation with group exchanges is far less trivial. A synchronous online group interaction would necessitate a level exchange synchronisation (that also need to be recorded in the dataset) in terms of time and turn-taking that is currently hardly feasible with the

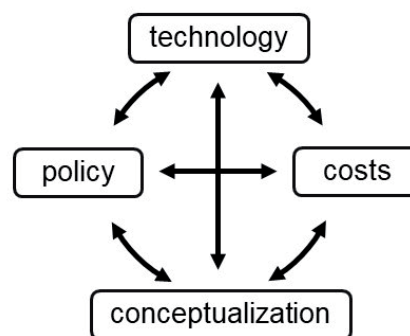


Fig. 2. Categories of challenges presented by Internet research for the study of first impressions meta-accuracy.

Source: Own research.

available software solutions. The solutions that do exist (e.g., some instant message clients that feature chat rooms) are associated with other types of challenges.

A challenge that is highly relevant in the present discussion is associated with data protection. According to Regulation 2016/679 of the European Parliament, more commonly referred to as the General Data Protection Regulation (GDPR), the data controller (experimenter) and the data processor (e.g., platform that collects and stores the data) are responsible for maintaining high levels of data anonymity and security. As a part of this policy, EU data may not be simply sent to and stored in non-EU countries that do not have the necessary agreement with the EU. Data may only be sent to and stored in such countries with the explicit participants' consent that covers in complete detail who will have access to their data, how their data will be stored and handled, the possible risks associated with such data processing, and other relevant information. In addition, the participants' right to withdraw from the study and request permanent deletion of their data must be guaranteed. Obtaining the full informed consent of the participants about how their data will be stored and handled in such countries, as well as guaranteeing together with the data processor the right of the participants to request permanent deletion of their data at any time becomes immensely laborious, time-consuming, and costly, as it requires significant effort on the side of both the data controller and processor. Thus, some software solutions that feature ways of collecting synchronous and/or group data but operate on non-EU servers become risky to use for EU researchers.

A way of complying with the policy restrictions is for the EU researcher is to set up their own EU-based server and to ensure the necessary level of data protection. Software solutions of the instant chat type could then be installed on this server and collect and store data according to GDPR policies. This approach, however, requires further time commitment and costs. In addition, in the case of the humanities and social science research, it may require the engagement of IT professional assistance (also related to time and financial expenditure).

Finally, Internet research may affect the ways of conceptualising the studied phenomena. For example, it is likely that both first impressions and meta-accuracy may be affected in its essence by the specifics of Internet communication. First impressions on the Internet may be generated on the basis of stimuli that are uncharacteristic of offline communication (e.g., emoji or combinations of emoji and written text, etc.). Would the stimulus on which the first impression is based change the nature of the first impression by activating different perceptual routes compared to those operating for offline first impressions? Would the type of stimulus or the synchronicity of Internet communication alter the nature of meta-accuracy? Would meta-accuracy be different for synchronous and for asynchronous first impressions? All these questions would need to be systematically and empirically addressed as their answers have the potential to affect the ways in which the phenomena are defined and measured. The alteration in definitions and measurement may then bridge on the other types of challenges. For example, the way the studied phenomenon is defined could affect the type of data that need to be collected (according to the GDPR special care is needed for personal data, i.e.,

data that could be used to identify a person) and with this the researcher needs to ensure both adequate policy compliance and technological approach to measurement. And as stated above, addressing these types of challenges might increase financial costs as well.

EXISTING SOLUTIONS

In this section we review a couple of existing solutions for conducting human interaction studies on the Internet and discuss the opportunities and challenges associated with each.

Chatplat (e.g., Huang et al., 2017) is a free online platform that allows the creation and execution of online studies that feature varying amounts of participants to talk to one another in a chat-like text-based environment. The environment is very realistic and allows control over the type of standard Internet expressive means for the participants (e.g., emoticons). Another advantage of Chatplat is that it makes it easy for the experimenter to be involved in the study as a confederate, just like in many classical laboratory interaction studies. Chatplat is also compatible with widely available online survey platforms such as Qualtrics, allowing incorporation of the interaction into more complex studies. Unfortunately, based on the readily available information about Chatplat, there is reason to assume that the chat exchanges are stored on servers located in the US (e.g., EagleDream Technologies, 2015), which would make Chatplat unsuitable or at least not straightforward to use for EU researchers from a GDPR point of view.

Another solution for conducting text-based human interaction experiments over the Internet is SMARTRIQS (Molnar, 2019). SMARTRIQS is also free and is open-source. In addition, it is easy-to-use for researchers without extensive technological background as it does not require programming knowledge. All these features make SMARTRIQS very attractive to researchers interested in studying real-time Internet interactions. SMARTRIQS, however, cannot function as a stand-alone solution and is only available within Qualtrics. Qualtrics guarantees GDPR compliance, thus alleviating policy-related concerns. However, the cost-related problems become significant. To be able to use SMARTRIQS, the researcher needs a Qualtrics account which, unless provided by the researcher's institution, may turn out to be very expensive and not affordable within their available funds.

In addition, both Chatplat and SMARTRIQS only allow the investigation of text-based exchanges. This raises the issue of realism, and with it we return once more to the conceptualisation challenge. Although at present first impressions do often take place in text-based virtual environments, they may still differ (in terms of underlying neuro-cognitive mechanisms and to-be-studied components) from first impressions using visual and auditory information.

Keeping in mind the various challenges and the restrictions they impose on research practices, the most efficient method for studying synchronous interactions may be to simulate them. In an experiment simulating online interaction participants would be asked to imagine taking part in an interaction and the responses

they receive would be pre-programmed and distributed according to specific algorithms. In a recent, not yet published experiment, we employed this method to study expected meta-accuracy for imagined human as opposed to imagined Artificial Intelligence Internet virtual assistants (Tsankova & Tair, 2021). We have only tested this method, however, for dyadic text-based first impression situations. We currently do not yet have a solution suitable for group interactions and interactions involving multiple information channels (e.g., text + image + sound).

CALL FOR ACTION

Based on the challenges associated with the Internet study of first impressions meta-accuracy we have encountered so far and outlined here, a clear need for action becomes evident. At present there is no optimal experiment software solution available to EU researchers for the study of first impression meta-accuracy on the Internet. However, instead of passively accepting the status quo, we are confident the most productive approach would be a proactive one. We choose to view the challenges as opportunities and as an impetus for change and for the development of new research tools. We find the case of Chatplat particularly inspiring—the platform was developed in a similar situation when its creator wanted to study online interaction but lacked the proper tools. Likewise, we would like to extend a call for action to interested researchers from all disciplines who would like to collaborate in the development of an *easy to use, GDPR-compliant, low-cost stand-alone or add-on experiment building tool that allows the study of dyadic and group interactions in synchronous and asynchronous Internet settings and employs multiple information channels (text, video, sound)*. We see the development of such a tool as a truly interdisciplinary endeavour whose outcome could foster progress in various areas of science. Although our call for action is inspired by a very specific case from the field of psychology (meta-accuracy of first impressions), a solution of the type we describe could be useful for any discipline that aims to address human interaction over the Internet. For example, researchers interested in facial mimicry and/or linguistic style matching from written and spoken text could resort to the possibilities such a tool would provide.

CONCLUSION

In this paper we have reviewed a number of opportunities and challenges associated with Internet research in the pandemic and post-pandemic era. The examples we have provided are highly specific as they are based on our personal experience with a research project whose beginning coincided with the COVID-19 pandemic onset. Although our observations emerged from the particular case of studying first impressions meta-accuracy, we believe they can be generalised to any research situation that addresses human interaction over the Internet.

The opportunities we have identified relate to convenience, time, technology, and costs. The challenges, on the other hand, are associated with conceptualisa-

tion, policy, technology, and costs. Although to improve flow and facilitate reading we have attempted a clear categorisation of challenges and opportunities, it has become clear both in the course of our research and throughout this report that the distinction between the factors is not that straightforward. First, the factors are in continuous dynamic interplay with one another, and isolating them is meaningless – they need to be taken into consideration together. Second, from our lists of factors and the two figures we have used in this paper it is immediately obvious that, for instance, technology and costs could be viewed as both opportunities and challenges associated with Internet research, depending on the circumstances. To illustrate, the Internet does present many technological advancements such as the quick collection of data in ready-to-use formats, but at the same time may cause trouble as many technological solutions are either overly complicated or do not meet the specific research needs and/or policy requirements. In a similar fashion, Internet research increases experimental costs in some situations (e.g., no laboratory maintenance, shorter participation times), but increases them in others (e.g., expensive subscriptions for some software solutions).

Given the connections among the factors and their dual (positive *and* negative) nature, we advise caution and a constructive approach that focuses on transforming what could be perceived as a challenge into an opportunity. We are confident that through interdisciplinary collaboration we could develop an efficient solution for the study of first impressions meta-accuracy and other aspects of human interaction on the Internet. Thus, we are grateful for the chance to reflect on the opportunities and challenges of Internet research in the pandemic and post-pandemic era, as we see this as a stimulus for the advancement of science.

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