

First impressions in Internet and face-to-face communication: A conceptual comparative analysis*

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Abstract. Efficient Internet communication requires solid understanding of why and how social processes differ between Internet and face-to-face environments. This paper adds to the understanding of these differences in relation to first impressions. Drawing upon previous research, theory, and intuition, the text compares three central components of first impressions (input, process, and output) in Internet and in face-to-face communication. It is shown through real-life examples how certain features of each communication environment are likely to affect the formation of first impressions. The conclusion is drawn that all three components of first impressions can be influenced by the unique characteristics of the communication setting, and a recommendation is made towards mindful self-presentation and impression formation in both settings.

Keywords: social cognition, first impressions, Internet, face-to-face, comparative analysis

Imagine your dream job... Now imagine you've been invited to an interview for it. You've been asked to choose whether you'd like to have the interview in person or online. You are so close to getting the position, it all depends on the interview at this point. No pressure, but you need to make an excellent impression. Which interview mode would you choose?

Both options come with their respective advantages and shortcomings. You need to be aware of those and pick the medium best suited to your communication style and current circumstances. Luckily, research on first impressions

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and social cognition on the Internet might hold some useful tips for situations like the one described above. This paper reviews relevant research highlights on both topics and piece them together with the aim of enhancing understanding of first impressions on the Internet. A desired byproduct of this analysis would be the alleviation of certain concerns that surround first impressions on the Internet.

Social cognition on the Internet

With various social aspects of today's life (e.g., work, education, entertainment, etc.) taking place partially or entirely on the Internet, it is natural to wonder about the nature and evolution of social cognition in the online world. Is social cognition on the Internet different from social cognition in face-to-face interaction and if so, in what respects? Do we perceive and engage with others in similar or different ways in the two communication environments? Studying the points of convergence and divergence between both settings in relation to social cognition would, on the one hand, enhance understanding of how social cognition evolves over time and as a function of the specifics of the environment, and, on the other hand, allow for the development of improved practices for efficient communication in both settings.

The present work is not the first to ask the above questions and to highlight the importance of comparing Internet to face-to-face social cognition. Sparrow and Chatman (2013a, 2013b) conducted a substantial review of research on social cognition on the Internet and outlined various ways in which social and cognitive processes may be affected by certain features of the Internet. The authors covered extensive topics such as the construction of social reality, persuasion, online transactive memory and reliance on the hive mind, cognitive load, etc. Their segment on perceiving others online (Sparrow, Chatman 2013a, 283-284) is particularly intriguing and relevant to the field of first impressions.

A crash course in first impressions

To set the ground for the forthcoming comparison of first impressions between Internet and face-to-face communication, the text first briefly outlines the essential characteristics of the studied phenomenon - first impressions - regardless of the interaction setting.

What are first impressions?

A first impression is the inference we make about an unfamiliar person's character upon our initial encounter with them. First impressions have received a lot of attention, both from the scientific community and the public. At the time of the writing of this text (November 2022), a Google Scholar search for the expression "first impressions" contained within English publication titles alone returned about 160,000 results. In addition, popular newspaper and magazine articles, books, and Internet posts of various types abound in advice on how to make good first impressions.

How are first impressions formed?

Very first impressions are formed instantaneously, based on information that becomes available within the initial 100 ms (Willis, Todorov 2006) or even 39 ms (Bar, Neta, Linz 2006) of exposure to information about the new person. Within these extremely brief time frames the person forming the impression (i.e., the perceiver) cannot engage in a conscious cognitive process. Rather, the formation of this very first impression is automatic (e.g., Bar, Neta, Linz 2006; Willis, Todorov 2006), the perceiver is often not consciously aware of the process, and the resulting impression is implicit. Such impressions are considered to be very robust (e.g., Gregg, Seibt, Banaji 2006) but could be modified under the right circumstances (e.g., Brannon, Gawronski 2017). Typically, such change is effortful and involves intentional higher-order cognitive processing.

Why are first impressions so important and worthy of attention?

The answer to this question has been intuitively felt by excellent communicators for centuries and has been recently dissected scientifically. Even if we are consciously unaware of their formation, first impressions are powerful and set the ground for our subsequent behaviour. First impressions have been shown to operate along the valence and dominance dimensions (Oosterhof, Todorov 2008), which align well with the warmth-competence model of social perception of Fiske, Cuddy and Glick (2007). In other words, first impressions contain an automatic evaluation of the person's valence or warmth (i.e., social qualities such as honesty, tolerance, modesty, helpfulness, etc.) and of the person's dominance or competence (i.e., power or intellectual qualities such as aggressiveness, intelligence, skill, determination, etc.). Among these two central dimensions, the valence/warmth one has been identified as the primary one (Fiske, Cuddy, Glick 2007). Very likely, the automatic formation of first impressions along these two dimensions reflects an important evolutionary function. In the early days of humanity, it has been a matter of life and death to be able to quickly judge whether or not you could trust another person. Thus, first impressions of trustworthiness (or valence/warmth) determine our approach-avoidance motivation (e.g., Slepian, Young, Harmon-Jones 2017). With the development of human society, it has also become essential to be able to quickly judge whether the other person is capable or competent enough to be trusted. The automatic nature of first impression formation still operates today, guiding behaviour on an intuitive basis.

The influence of first impressions has behavioural consequences for the individual (see, e.g., Harris, Garris 2008, for the behavioural consequences of first impressions in the context of employment interviews - the scenario also chosen for this paper due to its high personal relevance to the reader), but also for society at large. The societal impact of first impressions becomes evident when consensus among perceivers predicts the outcome of large-scale events such as political elections (e.g., Ballew II, Todorov 2007).

Comparison of face-to-face and Internet-based first impressions

Empirical approach

In practical terms, an experimental comparison of first impressions in face-to-face and Internet environments presents a challenge due to the impossibility of forming the same first impression twice (once in each environment). However, empirical research on the topic does exist. Hancock and Dunham (2001) circumvented this problem in a between-subject design where participants formed first impressions *either* in a face-to-face *or* an Internet setting (thus, simply not having the same impression occur twice). The authors showed that impressions formed in the two settings differed in terms of their *breadth* (face-to-face impressions were broader/more detailed compared to computer-mediated impressions, measured as the number of personality traits that were rated) and *intensity* (computer-mediated impressions were more intense compared to face-to-face impressions, measured as the magnitude of the personality ratings).

Theoretical approach

The aim of the present work was not to produce further empirical findings but to organize existing knowledge in a meaningful way. The benefit of doing so is the freedom of temporarily ignoring the practical problem of not being able to compare the same impression between the two settings. In addition, putting together various pieces of research provokes interesting speculations. At times, the text is rather forward with presenting points which feel intuitively correct but are currently unsupported by empirical evidence in the hope that they could serve as starting points for future research.

Model

The theoretical comparison is structured around a simplified model of first impressions (Fig. 1), based on literature and previous models from the areas of interpersonal perception and first impressions. More precisely, the key components and stages of first impressions were identified based on Funder (1995), Quadflieg and Westmoreland (2019), and Carlson and Elsaadawy (2021). Aiming for simplicity, the first impression phenomenon has been arbitrarily split

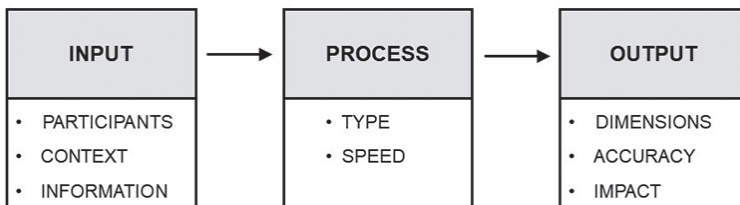


Fig. 1. Simplified model of first impressions used for the comparison

into three components - *input* (what goes into the impression), *process* (cognitive mechanism through which the impression is formed), and *output* (resulting impression). Below, the three components and their respective key elements are examined in turn by means of extracting from the literature the major points of convergence and divergence between online and offline communication settings.

Input. The input component has been further split into *participants* in the formation of the impression, *context* in which the impression is formed, and *information* that is used to create the impression.

Participants. The participants in the formation of the impression are those who form the impression (perceivers), and those about whom the impression is formed (targets). This division is, of course, arbitrary, as in everyday first encounters each interaction partner is typically simultaneously a perceiver and a target.

Both perceivers and targets may modify the input, and they may do so intentionally or unintentionally. Targets, for example, may put special effort into preparing their self-presentation. Both communication environments of interest here (Internet and face-to-face) provide targets with the possibility for careful preparation, although this preparation may vary between the environments. For example, one may prioritize grooming the face and upper body for Internet employment interviews, whereas face-to-face interviews call for full-body grooming. In addition, certain Internet forms of communication afford more control over self-presentation as they eliminate the spontaneity of face-to-face communication. This is especially true of largely non-visual and asynchronous exchanges, such as email, where targets have sufficient time to prepare what cues they provide and to react to incoming cues. The added lack of visual information reduces the possibility for nonverbal leakage (e.g., Ekman, Friesen 1969) from the target.

Although in the present role division perceivers might appear to be more passive than targets, they may also contribute to the input by engaging in selective processing of the information they receive from the targets. Selection may be both automatic and intentional, and may to some extent be guided by the specifics of the communication environment. Research has addressed the role of all sensory modalities in person perception, but has identified visual cues, and in particular facial cues, as key (e.g., Rule, Ambady 2008). However, whereas in face-to-face communication one may be clearly biased towards visual information and facial cues as they are easily available, in the absence of such information in certain forms of Internet exchanges (e.g., email, instant messaging) written verbal information might gain importance in forming first impressions. Thus, the balance between the sensory modalities with respect to their relative contribution to first impressions may change as a function of the communication environments' features and cause related attentional shifts on the perceiver's side.

Last but not least, perceivers' demographic (gender) and personality characteristics have been demonstrated to affect first impressions (e.g., Mattarozzi et al. 2015). These factors appear to be fairly stable with respect to the communication environment's features, yet may affect person perception. To illustrate, as

Internet behaviour appears to be related to higher levels of aggression, impulsivity, and narcissism compared to face-to-face behaviour (Aboujaoude 2017), it is not impossible that under certain circumstances these traits might become more prominent for both targets and perceivers in online compared to in-person employment interviews.

Context. The context of the first impression is defined here as the combination of physical, social, and environment-specific factors surrounding the impression formation. Physical factors relate to visual and/or auditory noise (e.g., Stacey et al. 2020), temperature (e.g., Williams, Bargh 2008), that may interfere with the formation of the impression.

Social factors relate to the presence of others, which is known to affect social processes in both face-to-face (e.g., Fridlund 1991) and telecommunication (e.g., Short, Williams, Christie 1976). In both communication settings social presence could be real (a person is actually present - e.g., they are physically in the same room or in the same videochat, etc.) or implied/felt (a person is not actually present but their presence is perceptible - e.g., awareness that a parent or a spouse are in the other room, or that a friend is on the same online discussion board). Presence tends to be more implied for Internet settings, but its intensity may be just as strong as real or implied presence in face-to-face settings.

It is important to note that in Internet settings there might be a combined effect of online and offline contextual factors. If we were to imagine again the employment interview scenario from the opening of the paper: You are seated in front of your computer and conversing with the interview panel. There is continuous loud noise from the construction site outside your window. Unknown to you, the room in which the panel is seated feels especially cold this morning due to malfunctioning of the air conditioning system. Both the noise and the temperature could interfere with impression formation by not allowing all verbal or nonverbal information contained in what you are saying to be delivered on the interviewers' end, and by making the interviewers more uncomfortable and guarded due to the cold ambiance. Thus, we need to acknowledge the possibility that first impressions on the Internet might be associated with more cognitive strain and uncertainty in the end result compared to in-person ones due to the overlay of on-and-offline stimuli.

Finally, environment-specific properties such as synchronicity, may also bias first impressions. In face-to-face encounters, which are synchronous, very first impressions are likely to occur along the automatic route - after all, this is the setting for which they emerged and for which automatic processing arose. The same principle is likely to apply to synchronous Internet settings. In asynchronous Internet settings, however, the automatic route may give way to the intentional processing. A temporal delay in the interaction allows for careful analysis of incoming information. In such cases, it is possible that Internet-based first impressions might result from higher-order cognitive processes.

Information. The information on which the impression is based may also differ, both in terms of quality and quantity, between Internet and face-to-face environments due to the affordances of each setting. For example, poor Internet connection might cause visual and/or auditory artifacts that disrupt an online meeting like our hypothetical employment interview. In addition, as suggested

above, different forms of Internet communication favour different perceptual modalities (e.g., visuals over sounds in the creation of profiles on social media). Finally, all perceptual modes are present in face-to-face interactions whereas the Internet is primarily visuo-auditory. Thus, it is reasonable to expect that first impressions on the Internet would be predominantly based on visual and auditory cues whereas first impressions formed in face-to-face interactions may also be influenced by the other perceptual modalities.

Overall, with respect to the input component, a conclusion could be drawn that, compared to face-to-face settings, the Internet simultaneously allows more control and places more restraints on information quality, quantity, and processing.

Process. The next component of the model, i.e., the process of impression formation, is characterized by two interrelated features - its *type* or *level of cognitive engagement* (automatic versus intentional) and the *speed* with which it takes place. Due to their interconnectedness these two features are discussed below together.

As discussed earlier, very first impressions are formed almost instantaneously and automatically (e.g., Bar, Neta, Linz 2006; Willis, Todorov 2006) due to their evolutionary significance. Undoubtedly, first impressions can also be formed and updated over longer periods of time and engage intentional higher-level analytical thinking (e.g., Brannon, Gawronski 2017). Each type of process is associated with specific neural correlates - spontaneous first impressions, which serve survival functions, automatically engage the limbic system (e.g., the amygdala, as reported by Winston et al. 2002), whereas deliberate impression formation reflecting analytical updating of social information activates a neural network engaged in higher-order social reasoning (e.g., the superior temporal sulcus, as reported by Winston et al. 2002).

Although evidence does suggest Internet-related changes in social cognition (Sparrow, Chatman 2013a; Sparrow, Chatman 2013b), these changes are mostly associated with higher-order cognitive processes related to the perception of the self and others, construction of social networks, and behavioural responses. Spontaneous first impressions are too fast and rudimentary to be influenced by the environment. They occur in the same way inside the fMRI scanner, on the street, or on the Internet - certain stimuli automatically engage certain brain structures and evoke certain social evaluations.

However, in the case of deliberate impression formation and updating of social information over time it is reasonable to assume that certain specifics of the Internet environment, which affect attention and memory (Sparrow, Chatman 2013a; Sparrow, Chatman 2013b) are also likely to affect the impression formation process and the nature of the underlying neural network. For example, if you choose to have your job interview over the Internet, you present the interviewers with the opportunity to divide their attention between listening to you (and nodding in agreement) on the one hand, and reaching out to online transactive memory by scanning through your application documents and searching for your profile on professional online platforms, on the other hand. They could also chat with one another and discuss things during the course of the talk. In this case, they have the chance to use multiple sources of information to quickly

and continuously update their impression of you. This would not be the case in a face-to-face interview where the multiple sources of information could only come once the talk is over. However, given the robustness of very first impressions (e.g., Gregg, Seibt, Banaji 2006), by that time the interviewers' impression of you would be significantly more difficult to overwrite.

In short, the automatic impression formation process is unlikely to differ between Internet and in-person interactions. The intentional impression formation process, however, may be affected by the specificities of the environment in such a way that impression updating is facilitated in computer-mediated settings. One needs to keep in mind though that this facilitation would only rely on information that is available, and as we have seen the Internet provides opportunities for careful curation of self-presentation, thus limiting the input into the impression formation process.

Output. The process of impression formation process results in the impression itself, which has been labelled as output in the current model. The output can be described by multiple characteristics that are essentially reduced to the *social cognition dimensions* the impression covers, the *accuracy* of the impression, and the impression's *potential for impact*.

Dimensions. Warmth and competence are referred to as universal dimensions of social cognition (Fiske, Cuddy, Glick 2007) because they are fundamental and guide processes such as impression formation in similarly structured ways under various circumstances. Evidence suggests that first impressions formed in Internet settings also align with the warmth and competence dimensions in the perception of both self and others (e.g., Tsankova, Tair 2022). In fact, even prior to the seminal universal dimensions publication of Fiske, Cuddy and Glick from 2007, Hancock and Dunham (2001) demonstrated that first impressions in both Internet and face-to-face interactions can occur for the same personality factors (NEO-FFI; Costa, McCrae 1991, cited in Hancock, Dunham 2001), but differ in terms of their breadth and intensity with Internet impressions being less broad and more intense than face-to-face ones.

Accuracy. Accuracy of first impressions refers to the correspondence between the impression and objective reality (not to be confused with consensus, which is the agreement between perceivers). The matter of the accuracy of first impressions is debatable. What could be added with respect to the ongoing discussion is that it is plausible that although informative in evolutionary respects very first impressions formed via the automatic route today are more likely to be erroneous than the ones formed via the intentional route. The former are based on very little information whereas the latter use more cues and update the output. Accuracy is likely to be a function of the amount and quality of available cues at the input stage and the level of cognitive engagement. The more information and time available, and the more accurate the information, the more accurate the resulting impression would be. There is no indication in the literature that either communication setting (Internet or in-person) is associated with higher accuracy of first impressions. The Internet does provide more opportunities compared to face-to-face settings for withholding, curating, and presenting information in a deceitful manner. At the same time the Internet also affords, or often imposes, intentional information processing.

Impact. With respect to the potential for impact there is no doubt that Internet provides ways to reach a wider audience in a shorter amount of time than do face-to-face interactions. A controversial statement made by a politician over the Internet can reach millions around the world within minutes. Overwriting the resulting impression would be a challenge. At the same time, we have learned to be very mindful of “fake news” and tend to take Internet content with a grain of salt. Therefore, it is possible that depending on the situation different weights would be assigned to Internet and face-to-face impressions, thus moderating the impressions’ impact. In the employment interview scenario it is likely that significant weight will be given to first impressions as this is the primary source of personal interaction with the candidate.

Overall, the above analysis leads to the conclusion that setting-specific differences between Internet and face-to-face communication may affect the outcome of the first impression formation process.

Conclusions

Summary

Motivated by the need to enhance understanding of social cognition in our hybrid face-to-face-and-Internet reality, this paper addressed a powerful phenomenon that sets the ground for all subsequent communication - first impressions. The work drew on the literature and intuitive judgment to compare the central components of first impressions between Internet and face-to-face interactions. The resulting main observation is that the communication setting is capable of influencing first impressions at the input, process, and output stages. However, it is not trivial to single out one or the other communication environment as superior or more advantageous. Both Internet and face-to-face interactions are part of everyday life and come with their unique characteristics. Communication efficiency and safety requires awareness of these characteristics, along with their related benefits and caveats, as well as fluency in their strategic utilization.

Limitations

This work does not come without shortcomings. To begin with, it follows a theoretical rather than empirical approach. It is necessary, however, to occasionally engage in similar theoretical analyses as they serve the function of integrating knowledge and identifying key points that may be omitted on the level of single empirical investigations. In addition, the nature of the arguments is occasionally highly speculative and, at times, provocative. This is on purpose - such arguments are intended to inspire research interest in areas where empirical evidence is lacking.

Final notes

This work set out to enhance understanding of first impressions on the Internet and possibly alleviate some concerns surrounding them. Hopefully, the presented analysis has revealed points of interest where misunderstanding or deceit could occur when first impressions are formed in computer-mediated communication. Generally, the intended message, arrived at as a result of the present work is that there is no reason for concern as long as there is a proper grasp on the overall characteristics of Internet communication and on the specifics of impression formation online.

So... Which communication setting would you choose for your dream job interview?

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