

Empathy, Kindness, and Moderation are not Just Formalities in Science

Alessandro Rovetta

Italy
Rovetta.mresearch@gmail.com
<https://orcid.org/0000-0002-4634-279X>

Lucia Castaldo

Italy
castaldolcu@gmail.com
<https://orcid.org/0000-0002-5316-1719>

Abstract. Science is a systematic approach to building and organizing knowledge through testable explanations and predictions. However, since scientists are human beings, they are fallible and subject to various systematic and random biases. The COVID-19 pandemic has definitively unmasked the humanity of scientists, who committed severe communication mistakes or even adhered to conspiracy hypotheses. Indeed, emotionality and rationality (if not epistemic) can foster intellectual dishonesty and compromise the effectiveness of critical thinking. This highlights the importance of the context in which a scientist works, as politeness and respect are essential to maintain lucidity, credibility, and transparency. However, outside of the academic context, many scientists do not behave with the same level of courtesy and carefulness required in scientific publishing. This happens despite communication – which is crucial for scientific investigation, dissemination, and debunking campaigns – being scientifically based on compassion. Specifically, an effective communication plan should be tailored to a specific audience, taking into account their emotional state, cultural and social background, and cognitive and psychological characteristics. The sole purpose must be to help and not to manipulate. Therefore, empathy, kindness, and moderation are essential tools for the success of science, from research to communication and education, and awareness campaigns and training courses should be instituted to promote such a message.

Keywords: communication; public health; ethics; science; infodemiology; media.

Empatija, geranoriškumas ir santūrumas nėra tik formalūs dalykai moksle

Santrauka. Mokslas yra sistemingas požiūris į žinių kaupimą ir organizavimą, pasitelkiant patikrinamus paaiškinimus ir prognozes. Kadangi mokslininkai yra žmonės, jie klysta ir yra veikiami įvairių sisteminių bei atsitiktinių šališkumų. COVID-19 pandemija galutinai atskleidė mokslininkų žmogiškumą, kurie padarė rimtų komunikacijos klaidų ar net laikėsi konspiracinių hipotezių. Iš tiesų emocionalumas ir racionalumas (jei ne episteminis) gali skatinti intelektualinį nesąžiningumą ir pakenkti kritinio mąstymo efektyvumui. Tai išryškina konteksto, kuriame dirba mokslininkas, svarbą, nes mandagumas ir pagarba yra būtini siekiant išlaikyti aiškumą, patikimumą ir skaidrumą. Tačiau už akademinio konteksto ribų daugelis mokslininkų nesielgia taip pat mandagiai ir atsargiai, kaip reikalaujama mokslinėje leidyboje. Taip atsitinka nepaisant to, kad bendravimas, kuris labai svarbus moksliniam tyrimui, sklaidai ir demaskavimo kampanijoms, mokslškai grindžiamas užuojauta. Konkrečiai, veiksmingas komunikacijos planas turėtų būti pritaikytas konkrečiai auditorijai, atsižvelgiant į

Received: 2023-05-21. **Accepted:** 2023-12-06.

Copyright © 2023 Alessandro Rovetta, Lucia Castaldo. Published by Vilnius University Press. This is an Open Access article distributed under the terms of the [Creative Commons Attribution Licence](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

jos emocijų būseną, kultūrinę ir socialinę aplinką, kognityvines ir psichologines savybes. Vienintelis tikslas turi būti padėti, o ne manipuluoti. Todėl empatija, geranoriškumas ir santūrumas yra esminiai įrankiai mokslui – nuo mokslinių tyrimų iki komunikacijos ir švietimo, tokiai žinutei skleisti turėtų būti rengiamos sąmoningumo didinimo kampanijos ir mokymai.

Reikšminiai žodžiai: komunikacija; visuomenės sveikata; etika; mokslas; infodemiologija; žiniasklaida.

Overview and objectives

We are researchers of public health and infodemiology. The motivations behind writing this paper stem from the communication errors made by a significant portion of the scientific community, including ourselves. It is crucial to understand that information is not a standalone entity but is inherently interconnected both with the way it is disseminated by the sender and with the (principally unconscious) tools through which it is processed by the receiver. Whether willingly or unwillingly, we all play communicative roles; as science-based individuals, we all must learn to adopt scientific methods for communication.

Practitioners' views

A brief introduction

COVID-19 has unleashed not only the largest viral pandemic but also the greatest infodemic – an epidemic of information – in human history (Pian et al., 2021). The overabundance of information – including dis-misinformation – has gripped both the general public and the scientific community, which had to navigate an unprecedented flood of data, publications, and opinions (Rousseau et al., 2023). As we will argue in this text, an infodemic is a multidimensional issue whose determinants and consequences are linked to complex and various psycho-social and cultural-ideological mechanisms. At present, the best evidence suggests that there is no communicative approach capable of fully addressing the infodemic issue, although much can be done both to limit and prevent its damage (OpenWHO, 2021).

What immediate actions can be taken?

The authors of this paper argue that the only comprehensive solution lies in a reformed education system that can ensure mastery of the intellectual and emotional tools to manage the information overabundance (infodemic resilience) (World Health Organization, 2021). This can be reached through games, laboratories, and preparatory exercises in schools. Indeed, any substantial change in the current intricate infodemiological situation would require a true international revolution at scientific, political, economic, and social levels, which seems unlikely in the short term. On the contrary, educating individuals to let them achieve strong analytical abilities appears to be more reasonable (Kont K.-R., 2023). In the interim, drawing on the most recent evidence available, we suggest that the impact

of the infodemic can be significantly curtailed by adhering to the guidelines put forth by the World Health Organization. Accordingly, we propose a series of recommendations for the global scientific community and health and educational authorities. We do not assert that such a list is conclusive, but rather hope it may serve as a catalyst for more comprehensive discussions and analyses.

- i) Implement and promote training courses on communication and infodemiology for all health, medical staff, and science teachers and people with a communicative role. Similar initiatives have been launched by international organizations such as the World Health Organization and private healthcare institutions, including the Mayo Clinic (OpenWHO, 2021; Mayo Clinic, 2019).
- ii) When participating in a dialogue with a firm skeptic on scientific matters, it's crucial to bear in mind that the objective of the communication is to reach the broader audience, not just the individual. As such, it's essential to steer clear of personal attacks (for instance, avoid disparaging their capabilities) and concentrate solely on addressing any discrepancies or gaps in the argument being presented. The tone should be consistently composed and respectful.
- iii) When participating in a dialogue on science, propose scientific evidence and, if available, the scientific community consensus on them. Additionally, it is essential to always present easily accessible and diverse sources (e.g., various international organizations along with independent institutions).
- iv) When participating in a dialogue on science, it's important to maintain authenticity, sincerity, and empathy, ensuring that these qualities resonate with the audience. Whenever feasible, incorporate narratives and real-world examples to foster a more direct and relatable approach.
- v) Try to understand the needs of the audience. For instance, in situations where the risk is underestimated, it becomes crucial to furnish data highlighting the potential hazards of the phenomenon. On the other hand, when the perceived risk exceeds the actual risk, it is recommended to provide reassurances rooted in adherence to general guidelines, ensuring neither exaggeration nor negligence.
- vi) Since the infodemic can lead to information overload and avoidance, when presenting a topic, go straight to the point using the simplest words possible. Whenever possible, create narratives using the SOCO approach (Single Overarching Communications Outcomes) provided by agencies like WHO and CDC (Centers for Disease Control and Prevention, n.d.).
- vii) In anticipation of a structured educational program, teachers, with the necessary backing from educational psychologists, should commence the introduction of simplified infodemiological issues and analyses to students in schools. This would kick-start the cultivation of critical thinking skills and aid in averting undesirable occurrences such as information overload.
- viii) As scientists and/or health professionals, no matter how challenging it may be, it is our responsibility to ensure that our actions in sensitive fields are always

consistent with the latest scientific evidence. This requires intellectual honesty to admit that we are human too, i.e., that we are emotional and subject to bias. Therefore, the central question I must always ask myself is: “Is what I am about to do (e.g., commenting on a Facebook post) dictated by my scientific knowledge?” In other words: “Do the most recent communication models support my action strategy?”

As a final note, we point out that science should be communicated as a mean to model our reality in order to improve our quality of life rather than the search of the truth. It is simply the method that has been most advantageous in reducing uncertainties associated with decisions so far. This would help people in understanding its role and relevance.

A sea of biases and determinants

During the COVID-19 pandemic we have witnessed serious communication mistakes even by health professionals and medical experts (Rovetta & Castaldo, 2022; Sule et al., 2023). For example, a common practice has been to publicly label individuals who do not follow scientific evidence as “stupid” or “ignorant.” Not only is this simplistic and inaccurate, but it is paradoxical because current scientific evidence suggests that: i) accepting conspiracy hypotheses is linked to ideological influences (such as religion and politics) and/or deep psychological mechanisms (e.g., lack of reasoning and knowledge but also low conscientiousness, reliance on heuristics, pathologies, disturbed personalities, and negative emotions) (Pennycook & Rand, 2021; Lawson & Kakkar, 2022; Stasielowicz, 2022; Purnat et al., 2023); ii) the current communication models agree in condemning the use of insults when dealing with the general public (OpenWHO, 2021; Purnat et al., 2023). Moreover, the conspiracy phenomenon manages to penetrate even the rational defenses of those well-versed in science, although individuals with less structured knowledge are generally more susceptible (Tsamakis et al., 2022; Bryanov & Vziatysheva; 2021). Even intelligent and cultured people can also act like lawyers, using their reasoning abilities to protect their identities and ideological commitments rather than to uncover the “truth” (Kahan, 2013; Nickerson, 1998). Emotion can also fuel the same phenomenon (Jung et al., 2014; Martel, 2020). In summary, emotionality and rationality (if not epistemic) can foster intellectual dishonesty and compromise the effectiveness of critical thinking (Kunda, 1990; Ståhl & van Prooijenb, 2018).

The “part-time” scientist problem

Aggressive language can undermine trustworthiness and credibility in scientific debates (König & Jucks, 2019). Negative reactions are related to the increase in emotional reactivity, i.e., the tendency to react impulsively when feeling stressed, angry, or hurt, and psychological reactance, i.e., the tendency to respond to limitations imposed on us by raising the value we assign to the limited item or behavior (Eman et al., 2019; Hateftabar

et al., 2022). These are among the reasons why scientific publishing explicitly demands politeness and respect (Dhillon, 2021). Nonetheless, outside the academic context, sarcasm and arrogance are often used by scholars to comment on disagreements with other people (König & Jucks, 2019; Rovetta & Castaldo, 2022). In this regard, it is essential to stress that the scientific method must be followed at all times and not only where it is convenient or comfortable to do so. Therefore, we all have the duty to follow the evidence wherever it leads and to adapt our behavior accordingly.

Communication is the cornerstone

Communication forms the foundation of all human relationships (Semin & Groot, 2013; De Netto et al., 2021). However, one of the primary historical barriers to a proper application of the related theory is the underestimation of its relevance (Waitzkin, 1984; Sharf, 1999; Biasio et al., 2018; Ifrim et al., 2022). Regarding the scientific scenario, the communication system is activated at three critical stages: within the scientific community (e.g., conferences), from the scientific community to policy makers (e.g., decision making), and from policy makers and scientists to the general public (e.g., information campaigns) (O’Hair & O’Hair, 2021). Therefore, since it is inherently embedded in the social and political context, upon which its survival (e.g., research funding) and practical utility (e.g., adoption of new technologies by society) depend, science has no tangible value unless well communicated. The characteristics that define a good communication theory include the ability to explain and predict, simplicity (parsimony), the potential to be proven false (falsifiability), internal consistency, the capacity to stimulate interest (heuristic provocativeness), and structural strength (organizing power) (O’Hair & O’Hair, 2021). Effective health communication should be tailored to the specific audience, taking into account people’s emotional state, cultural and social background, and cognitive and psychological characteristics (Jarrett et al., 2015; Kairys et al., 2023). For instance, many healthcare workers have been reluctant to express their concerns about COVID-19 vaccines, fearing their peers’ judgment (Heyerdahl et al., 2022; Heyerdahl et al., 2023). For these reasons, temperance and empathetic listening to the communities’ doubts, fears, and even skepticism, are crucial for the success of scientific discussions and communication, dissemination, and debunking campaigns (two-way communication) (Purnat et al., 2023). This is especially true when dealing with people who adhere to conspiracy thinking since examining and understanding the motivations that make the latter appealing is vital to counter the phenomenon (Drażkiewicz, 2022). Indeed, the goal of debunking is not to contradict a single person – which can reinforce their wrong beliefs due to reactivity, reactance, and possibly the so-called “backfire effect” (Swire-Thompson et al., 2020; Swire-Thompson et al., 2022) – but to inform all readers of the current scientific evidence on the subject discussed. The sole purpose must be to help and not to manipulate (Freiling et al., 2023).

References

- Biasio, L. R., Carducci, A., Fara, G. M., Giammanco, G., & Lopalco, P. L. (2018). Health literacy, emotionality, scientific evidence: Elements of an effective communication in public health. *Human vaccines & immunotherapeutics*, *14*(6), 1515–1516. <https://doi.org/10.1080/21645515.2018.1434382>
- Bryanov, K., & Vziatysheva, V. (2021). Determinants of individuals' belief in fake news: A scoping review determinants of belief in fake news. *PLoS ONE*, *16*(6), Article e0253717. <https://doi.org/10.1371/journal.pone.0253717>
- Centers for Disease Control and Prevention. (n.d.). *Single Overriding Communication Objective (SOCO) Worksheet*. Retrieved November 30, 2023, from <https://www.cdc.gov/healthywater/emergency/dwa-comm-toolbox/before/tools/Single-Overriding-Comm-Objective-Worksheet.docx>
- De Netto, P. M., Quek, K. F., & Golden, K. J. (2021). Communication, the Heart of a Relationship: Examining Capitalization, Accommodation, and Self-Constraint on Relationship Satisfaction. *Frontiers in psychology*, *12*, Article 767908. <https://doi.org/10.3389/fpsyg.2021.767908>
- Dhillon, P. (2021). How to be a good peer reviewer of scientific manuscripts. *The FEBS journal*, *288*(9), 2750–2756. <https://doi.org/10.1111/febs.15705>
- Drażkiewicz, E. (2022). Study conspiracy theories with compassion. *Nature*, *603*(7903), Article 765. <https://doi.org/10.1038/d41586-022-00879-w>
- Freiling, I., Krause, N. M., & Scheufele, D. A. (2023). Science and Ethics of “Curing” Misinformation. *AMA journal of ethics*, *25*(3), E228–E237. <https://doi.org/10.1001/amajethics.2023.228>
- Heyerdahl, L. W., Dielen, S., Dodion, H., Van Riet, C., Nguyen, T., Simas, C., Boey, L., Kattumana, T., Vandaele, N., Larson, H. J., Grietens, K. P., Giles-Vernick, T., & Gryseels, C. (2023). Strategic silences, eroded trust: The impact of divergent COVID-19 vaccine sentiments on healthcare workers' relations with peers and patients. *Vaccine*, *41*(4), 883–891. <https://doi.org/10.1016/j.vaccine.2022.10.048>
- Heyerdahl, L. W., Dielen, S., Nguyen, T., Van Riet, C., Kattumana, T., Simas, C., Vandaele, N., Vandamme, A. M., Vandermeulen, C., Giles-Vernick, T., Larson, H., Grietens, K. P., & Gryseels, C. (2022). Doubt at the core: Unspoken vaccine hesitancy among healthcare workers. *The Lancet regional health. Europe*, *12*, Article 100289. <https://doi.org/10.1016/j.lanepe.2021.100289>
- Ifrim, R. A., Klugarová, J., Măguriță, D., Zazu, M., Mazilu, D. C., & Klugar, M. (2022). Communication, an important link between healthcare providers: a best practice implementation project. *JBI evidence implementation*, *20*(S1), S41–S48. <https://doi.org/10.1097/XEB.0000000000000319>
- Jarrett, C., Wilson, R., O'Leary, M., Eckersberger, E., Larson, H. J., & SAGE Working Group on Vaccine Hesitancy (2015). Strategies for addressing vaccine hesitancy - A systematic review. *Vaccine*, *33*(34), 4180–4190. <https://doi.org/10.1016/j.vaccine.2015.04.040>
- Jung, N., Wranke, C., Hamburger, K., & Knauff, M. (2014). How emotions affect logical reasoning: evidence from experiments with mood-manipulated participants, spider phobics, and people with exam anxiety. *Frontiers in psychology*, *5*, Article 570. <https://doi.org/10.3389/fpsyg.2014.00570>
- Kahan, D. M. (2013). Ideology, motivated reasoning, and cognitive reflection. *Judgment and Decision Making*, *8*(4), 407–424. <https://doi.org/10.1017/S1930297500005271>
- Kairys, A., Jurkuvėnas, V., Mikuličiūtė, V., Ivleva, V., & Pakalniškienė, V. (2023). Characteristics of Older People's Belief in Real and Fake News. *Information & Media*, *97*, 49–68. <https://doi.org/10.15388/Im.2023.97.59>
- Kont, K.-R. (2023). Cyber Literacy Skills of Estonians: Activities and Policies For Encouraging Knowledge-Based Cyber Security Attitudes. *Information & Media*, *96*, 80–94. <https://doi.org/10.15388/Im.2023.96.67>

Kunda, Z. (1990). The case for motivated reasoning. *Psychological bulletin*, 108(3), 480–498. <https://doi.org/10.1037/0033-2909.108.3.480>

Lawson, M. A., & Kakkar, H. (2022). Of pandemics, politics, and personality: The role of conscientiousness and political ideology in the sharing of fake news. *Journal of experimental psychology: General*, 151(5), 1154–1177. <https://doi.org/10.1037/xge0001120>

Martel, C., Pennycook, G., & Rand, D. G. (2020). Reliance on emotion promotes belief in fake news. *Cognitive research: principles and implications*, 5(1), Article 47. <https://doi.org/10.1186/s41235-020-00252-3>

Mayo Clinic School of Continuous Professional Development. (2019). *COVID-19: Countering an "Infodemic" of Misinformation – For CME Credit - Online*. Retrieved October 15, 2023, from <https://ce.mayo.edu/online-education/content/covid-19-countering-infodemic-misinformation-%E2%80%93cme-credit-online#group-tabs-node-course-default1>

Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2(2), 175–220. <https://doi.org/10.1037/1089-2680.2.2.175>

O’Hair, H. D., & O’Hair, M. J. (2021). Managing Science Communication in a Pandemic. In H. D. O’Hair & M. J. O’Hair (Eds.), *Communicating Science in Times of Crisis: The COVID-19 Pandemic* (pp. 1–14). John Wiley & Sons Inc. <https://doi.org/10.1002/9781119751809.ch1>

OpenWHO. (2021). *Infodemic management 101*. Retrieved October 15, 2023, from <https://openwho.org/courses/infodemic-management-101>

Pennycook, G., & Rand, D. G. (2021). The Psychology of Fake News. *Trends in cognitive sciences*, 25(5), 388–402. <https://doi.org/10.1016/j.tics.2021.02.007>

Pian, W., Chi, J., & Ma, F. (2021). The causes, impacts and countermeasures of COVID-19 „Infodemic“: A systematic review using narrative synthesis. *Information processing & management*, 58(6), Article 102713. <https://doi.org/10.1016/j.ipm.2021.102713>

Purnat, T. D., Nguyen, T., & Briand, S. (Eds.). (2023). *Managing Infodemics in the 21st Century: Addressing New Public Health Challenges in the Information Ecosystem*. Springer Cham. <https://doi.org/10.1007/978-3-031-27789-4>

Rousseau, R., Garcia-Zorita, C., & Sanz-Casado, E. (2023). Publications during COVID-19 times: An unexpected overall increase. *Journal of Informetrics*, 17(4), Article 101461. <https://doi.org/10.1016/j.joi.2023.101461>

Rovetta, A., & Castaldo, L. (2022). Are We Sure We Fully Understand What an Infodemic Is? A Global Perspective on Infodemiological Problems. *JMIRx med*, 3(3), Article e36510. <https://doi.org/10.2196/36510>

Semin, G. R., & Groot, J. H. (2013). The chemical bases of human sociality. *Trends in cognitive sciences*, 17(9), 427–429. <https://doi.org/10.1016/j.tics.2013.05.008>

Sharf, B. F. (1999). The present and future of health communication scholarship: overlooked opportunities. *Health communication*, 11(2), 195–199. https://doi.org/10.1207/s15327027hc1102_5

Stähl, T., & van Prooijenb, J. W. (2018). Epistemic rationality: Skepticism toward unfounded beliefs requires sufficient cognitive ability and motivation to be rational. *Personality and Individual Differences*, 122, 155–163. <https://doi.org/10.1016/j.paid.2017.10.026>

Stasielowicz, L. (2022). Who believes in conspiracy theories? A meta-analysis on personality correlates. *Journal of Research in Personality*, 98, Article 104229. <https://doi.org/10.1016/j.jrp.2022.104229>

Sule, S., DaCosta, M. C., DeCou, E., Gilson, C., Wallace, K., & Goff, S. L. (2023). Communication of COVID-19 Misinformation on Social Media by Physicians in the US. *JAMA network open*, 6(8), Article e2328928. <https://doi.org/10.1001/jamanetworkopen.2023.28928>

Swire-Thompson, B., Dobbs, M., Thomas, A., & DeGutis, J. (2023). Memory failure predicts belief regression after the correction of misinformation. *Cognition*, *230*, Article 105276. <https://doi.org/10.1016/j.cognition.2022.105276>

Swire-Thompson, B., Miklaucic, N., Wihbey, J. P., Lazer, D., & DeGutis, J. (2022). The backfire effect after correcting misinformation is strongly associated with reliability. *Journal of experimental psychology. General*, *151*(7), 1655–1665. <https://doi.org/10.1037/xge0001131>

Tsamakis, K., Tsipsios, D., Stubbs, B., Ma, R., Romano, E., Mueller, C., Ahmad, A., Triantafyllis, A. S., Tsitsas, G., & Dragioti, E. (2022). Summarising data and factors associated with COVID-19 related conspiracy theories in the first year of the pandemic: a systematic review and narrative synthesis. *BMC psychology*, *10*(1), Article 244. <https://doi.org/10.1186/s40359-022-00959-6>

Waitzkin, H. (1984). Doctor-patient communication. Clinical implications of social scientific research. *JAMA*, *252*(17), 2441–2446. <https://doi.org/10.1001/jama.252.17.2441>

World Health Organization. (n.d.). *Infodemic*. Retrieved November 30, 2023, from <https://www.who.int/health-topics/infodemic>