Language Problems in Science Communication at a Multilingual Setting: A Review Study

Naba Raj Budhathoki[1,2]

[1] Central Department of English, Tribhuvan University; nrbudhathoki@gmail.com

[2] Department of Science and Humanities, Khwopa Engineering College, Purbanchal University, Bhaktapur, Nepal;

Corresponding email: nr.budhathoki@khec.edu.np

Received: February 20, 2025

Revised: March 30, 2025

Accepted: April 20, 2025

Published: June 30, 2025

DOI: https://doi.org/10.3126/kjour.v7i1.80106

How to cite this paper:
Budhathoki, N. R. Language Problems in Science Communication at a Multilingual Setting: A Review Study. *Khwopa Journal, 7*(1). https://doi.org/10.3126/kjour.v7i1.80106

ABSTRACT

Communicating scientific and technological discoveries to the public is seen as science communication as opposed to scientific communication. Technical language and style are extensively required for discussing scientific concepts and discoveries. In specialized disciplines, their use makes concepts more precise and clearer; however, it can present difficulties to communicate the scientific information to the public. This review examines the major components of scientific language, namely readability, sentence structure, and jargon usage. In addition to discussing methods for enhancing the readability and clarity of scientific literature, it looks into how these linguistic characteristics affect science communication, such as earthquake related communication. Additionally, the review highlights new research on how jargon and complex sentence structures coupled with frequent passive voice may affect the public's comprehension and acceptance of scientific knowledge in a multilingual situation, demanding setting-specific studies.

Keywords: Technical language, science communication, jargon, readability, sentence structure, accessibility, persuasion.

1. Introduction

Science communication grew as a discipline mostly in the 20th century, with its notable developments in recent decades (Broks et al., 2020). The expansion of media technologies and the explosion of scientific knowledge have widened the information gap across various societal sectors by

posing both possibilities and problems for science communication (Priest, 2010). To close this gap and engage a variety of audiences, there is now a greater need for good science journalism and communication (Priest, 2010). From conventional ideas to more sophisticated models that take into consideration the intricate relationships between scientific knowledge and the general public, the theoretical understanding of science communication has changed throughout time (Bucchi, 2008). Science communicators face a number of obstacles as the discipline grows. Linguistic barrier is one potential obstacle.

Science communication outcomes and feedback may be challenging to study scientifically; they necessarily happen in the real world, rather than the controlled environment of a research laboratory. It usually requires skills more from the social than the physical sciences. Deeper comprehension of science communication issues may be obtained using qualitative methods. It is also important to realize that significant long-term consequences of science communication may occur as participants contemplate their knowledge, confront other new experiences, and rationalize their reasoning.

The basis for the spread of scientific information is scientific language, which greatly influences how scientists communicate their findings and interact with diverse audiences. The scientific language is characterized by discipline-specific jargons and organized complex sentence structures, coupled with frequent passive voice that enable accurate communication amongst specialists. However, when communicating with non-specialist audiences, the same language characteristics that facilitate clarity inside scientific societies may become barriers. This potential language barrier requires a continuous discussion on the efficacy, readability, and accessibility of science communication. This review addresses the influence of lexical and syntactic aspects of language on public comprehension, along with suggestions to improve science communication's efficacy.

1.1. Science Communication against Scientific Communication

There are two categories of communicating science, namely science communication, which involves communicating science with non-experts, and scientific communication, which involves scientists discussing their work within their community. Scientists are mainly taught and trained to have a discourse over their expertise in a very specific language. This might make it problematic for the scientific community to communicate with non-experts. The whole population of scientists or those directly engaged in various aspects of the practice of science is considered to be the scientific community (Burns et al., 2003).

However, the meaning of science communication still lacks clarity. According to Burns et al. (2003), the terms "science communication," "public awareness of science," "public understanding of science," "scientific culture," and "scientific literacy" can all be used interchangeably. In essence, scientific discoveries are useless to society if they

have no social importance. Therefore, in addition to their participation in scientific activities, all participants should be actively involved in science communication. Science communication promotes AEIOU (Awareness, Enjoyment, Interest, Opinion-forming, and Understanding of science) feedback from its participants to improve public scientific perception, comprehension, education, and culture (Burns et al., 2003). An appropriate definition offers a conceptually straightforward foundation for assessing the effectiveness of science communication and is especially relevant to science outreach. Accordingly, science communication contributes to the assimilation of scientific knowledge and culture into the broader population. Additionally, it underscores the culturally subtle elements of science communication.

1.2. Science Communication Practice in Nepal

In the past, local communities depended on folk knowledge, religious teachings, and firsthand experiences to learn about agriculture, health, and natural catastrophes in Nepal. Indigenous practices and oral traditions were the primary means of transmitting scientific knowledge (Sharma et al., 2009). The modern period of scientific communication began in the middle of the 20th century when Tribhuvan University was founded in 1959 in the country. One of the most important factors in raising scientific knowledge was the advent of organized science instruction in schools and universities. However, English was primarily used for research and higher education activities, and this put many ordinary people at a disadvantage. Science communication activities grew in several forms along with the mass media expansion in 1990s. Science matters began to be published in the print and broadcast media, especially focusing on agriculture, health, and environmental sciences. Nepal Academy of Science and Technology (NAST) was founded in 1982 to promote science and technology in the country, with the initiation in publications and public participation. NAST has been attempting to increase public knowledge of science and technology in Nepal, and one remarkable initiation is science communication. Since its inception, it has been conducting many promotional programs, including science contests, science exhibitions, science quizzes, Olympiads, and workshops for potential science communicators. Additionally, especially in rural areas, it encourages schools to organize these activities on their own initiative. Beyond Katmandu Valley, more than 30 districts have directly participated in the program to cultivate a scientific mindset and expand scientific culture. The other goals are to raise public knowledge of science and technology in everyday life, allow schools to create basic science kits, and use locally accessible materials to illustrate scientific phenomena.

The lay people get scientific information mainly through mass media. There are several reasons to this. First, science and scientists are regularly featured on mass media, especially in developed countries. More importantly, media are much used by the general public, and in many cases, they are the only options available to receive information about scientific findings, debates, programs and research findings of

experts.

Science communication has grown even more in the twenty-first century with the emergence of digital media. Social media platforms have opened up new channels for sharing scientific information with a larger audience. Despite advancements in communication technology and social media raising awareness, evidence-based information remains a low priority in Nepal's science communication landscape (Adhikari et al., 2023). A large portion of scientific discourse is still performed in English. While communicating science to society through different media, Nepali is mostly used language, while few other languages are used. Moreover, English words, technical terms and complex sentence structures are likely to be used though Nepali is used for communication. Hence, there may be linguistic difficulties in making scientific knowledge accessible in Nepali and other regional languages in Nepali Society. The science–society dialogue is not developing with a genuine communication in science and technology. This may mar the smooth development of the sector.

1.3. Science Communication in a Multilingual Setting

Language becomes a significant concern when conveying scientific information to the general population in developing countries. This is particularly evident in regions where English is exclusively used in formal contexts and as the primary medium of instruction in academic institutions. The problem is exacerbated in places where the majority of people do not speak English as their first language and where scientific words are more often conveyed in English. For instance, earthquake scientists emphasize the importance of constructing resilient structures, and the primary focus of earthquake engineering communication revolves around risk communication. However, in a place like Nepal, it seems that the general population is not sufficiently aware of the potential dangers posed by earthquakes, despite specialists' warning that such disasters can occur at any time in the country's future. This situation underscores the urgent need for effective communication of earthquake-related matters to both the general public and professionals.

Taking a particular case, Nepal is a linguistically varied country that reveals its rich ethnic and cultural variety (CBS, 2021), with more than 124 languages spoken in different parts of the country. The official language and lingua franca is Nepali, although several native languages, including Maithili, Bhojpuri, Tamang, and Newari, are highly valued in the region. Effective communication may be hampered by this multilingual environment, especially when conveying technical or scientific knowledge to linguistically heterogeneous audiences. In line with the Sapir-Whorf hypothesis, people understand scientific content in their mother tongue effectively and adopt the knowledge practically (Kay et al., 1984). Even when scientific content is available in Nepali, it may be challenging for readers due to complex phrase patterns and jargon. In such a context, communicating scientific knowledge in a language characterized by

lexical and syntactic complexity may be more challenging.

2. Materials and Methods

Technical language, science communication, jargon, readability, sentence structure, accessibility and persuasion are the key words used alone and in combination for literature search. A comprehensive search was conducted using Google, Google Scholar, Research Gate, Springer, Academia, ProQuest, and RemoteXs offered by Tribhuvan University Central Library (TUCL), among other search engines. It involved reviewing relevant conceptual, theoretical, and empirical literature that has been accessible to the present day from private, institutional, and community libraries. It also investigated miscommunication in the aftermath of the Gorkha earthquake as a case.

With the above-mentioned literature exploration, this review synthesizes the results of several studies that looked at how jargon, sentence structure, readability, and public perception affect science communication. Studies that examine textual complexity, experimental results on persuasion and risk perception, and methods to increase the efficacy of communication are all included. The evaluation also takes into account research that quantifies how technical language affects public understanding and interest in science.

3. Results and Discussions

There is a notable scarcity of science communication research literature focused on the developing world. Most empirical studies over the challenges of science communication majorly emerge from developed and English-speaking countries (Massarani, 2015). Moreover, the role of language elements in impacting the willingness of experts in a multilingual society, like Nepal, to engage with the public has been largely overlooked in research on scientists' public communication practices.

3.1. Miscommunication in Aftermath of the Gorkha Earthquake

Two million people got displaced, and more than 8,000 people lost their lives as a result of the 2015 Gorkha earthquake (Mw 7.8) (Hall et al., 2017). Although the immediate effects were catastrophic, misunderstandings and linguistic limitations in earthquake risk communication made the aftermath even more difficult. The distribution of conflicting and jargon-filled aftershock warnings was one of the most serious mistakes, resulting in subsequent accidents, needless evacuations, and public panic. It was challenging for the general public to comprehend the true risk since government organizations and scientific institutes used extremely technical jargon in their comments. Frequent use of technical language hinders understanding and has a detrimental effect on perceptions of expertise and trustworthiness (Therese Joiner et al., 2002). In Nepali expert interviews, terms like 'liquefaction,' 'epicenter,' 'tectonic plate,' and 'magnitude' were most commonly used, and even in Nepali texts,

भुकम्प, **परकम्प**, and **पराकम्पन** were among the jargon used in earthquake communication. However, they were not adequately explained to lay audiences. The worst is **परकम्प**, **पर कम्पन**, **पराकम्पन**, etc., were confusingly used, for instance. Misinterpretations of technical terms, like "high probability of aftershocks," caused inflated panic because the public confused probability with certainty. Many misunderstood the instructions given for earthquake safety measures, so they died as they came inside to hide under the table or bed, even when they were out in the open spaces during the earthquakes. Earthquake communication may be lacking precise, effective lexical and syntactic features of language.

The media and general public were confused by the disparate aftershock risk assessments provided by the US Geological Survey and the Nepal Earthquake Monitoring and Research Centre. Some media sources disseminated false headlines like "A larger earthquake is imminent!" by sensationalizing or simplifying difficult material. Inaccurate information was disseminated by local officials and community leaders, many of whom lacked technical expertise, which increased panic.

When locals misinterpret the hazards and lack proper warnings, evacuations could be delayed, according to studies of earthquake survivors (Ando et al., 2011). During the 2016 Kumamoto Earthquake, many locals misinterpreted aftershock information from several sources due to their pre-existing knowledge and awareness (Kimura et al., 2017). The lack of broadband access and the need for volunteer-based emergency workforces pose particular difficulties for rural towns in terms of emergency planning and response. The safety of first responders and citizens' capacity to prepare for catastrophes are jeopardized by these issues, which also make it difficult to get and disseminate vital information (Doke et al., 2020). According to the research, word-of-mouth communication is crucial to evacuation practices during emergencies, especially in rural regions where access to reliable information is restricted. In the aftermath of the Gorkha earthquake, public faith in government agencies and scientific organizations was eroded by the dissemination of conflicting and technical earthquake warnings. Afterwards, many individuals started to disregard earthquake warnings, believing them to be inflated or untrustworthy. Clear, understandable, and linguistically appropriate seismic communication is essential, as demonstrated by the misunderstandings surrounding the 2015 Gorkha earthquake. In order to avoid confusion and fear, the catastrophe disclosed communication issues, such as the necessity of quick, understandable, and compassionate information transmission. Lessons learnt include the need for a Nepal-centric approach to disaster management, the development of local leadership, and the need of community engagement in disaster response (Hall et al., 2017). In order to provide timely and easily available information during the crisis, effective communication strategies—like those used by @LastQuake on Twitter—are essential (Corradini et al., 2021). Important words should be explained, and earthquake risk communications should be devoid of superfluous jargon.

The 2015 Gorkha earthquake case serves as an example of how the public might become alarmed, more vulnerable, and distrustful of authorities due to technical language, inadequate translation and explanation, and contradicting messages. In the case of another earthquake, disaster response organizations may contribute to the reduction of false information and the enhancement of public safety by emphasizing communication that is clear, accessible, and grounded in science.

3.2. Jargon in Science Communication

Jargon refers to specialized vocabulary used within a specific field, often inaccessible to those outside the discipline. While it enhances precision among experts, it can hinder communication with lay audiences. Many everyday words, such as 'work,' 'power,' 'stress,' and 'energy,' have distinct scientific meanings, contributing to potential misunderstandings.

Scientific discourse conducted in the target audience's native language may result in increased engagement, motivation, and optimism as well as better ties to ideas in the culture of the intended audience. Experts frequently employ technical language while speaking to lay audiences, according to research (Sharon et al., 2014). While many have observed that the usage of scientific language hinders comprehension (Brooks, 2017), the current study additionally examines if jargon, which is employed here as a shorthand for scientific language, influences thoughts and results that go beyond comprehension. According to dictionary definitions, jargon is described as specialized terms or idioms used by a certain group or profession that are hard for outsiders to grasp (dictionary.com). Jargon may also be seen more generally as the language of science (Krieger, 2017), which describes communication meant for highly skilled audiences that aims to provide technical information on the current status of research in the medical and STEM domains. These definitions raise concerns about the usage of jargon, which Krieger and Gallois (2017) point out should make scientific content harder to understand for lay audiences. While all of these deficiencies are problematic and contribute to negative opinions about science in general (Brooks, 2017; Krieger & Gallois, 2017), the approach for designing messages that would address comprehension problems and accessibility issues could differ.

Jargon is often used to disseminate expert knowledge, display competency, or relate to highly specific ideas (Grupp et al., 1975). In addition to being technical, jargon is more often used or understood by those who belong to a certain group or profession, such as scientists, attorneys, or medical professionals, and is less common among those who do not (Sharon et al., 2014). According to research on the adverse effects of jargon (Grupp et al., 1975; Sharon et al., 2014), non-experts' inability to completely grasp jargon-laden material is the reason why negative consequences are observed. According to previous studies, processing fluency can be affected by linguistic difficulties (Shulman et al., 2018). In particular, compared to simpler language, the employment of more

difficult words considerably decreases processing fluency. However, unfamiliarity is linked to a challenging processing experience, which produces negative results including skepticism (Nelson et al., 1998), risk (Song et al., 2009), and a depletion of trust, liking, and comprehension (Shulman et al., 2018).

The existing global scientific environment has a language bias that affects non-native English speakers and keeps them from actively engaging in the scientific process as citizens and scientists (Márquez et al., 2020). English was acknowledged as the international language of science in 1967 (Gordin, 2015), and it still controls most scientific activities worldwide. English's linguistic dominance is also evident in scientific media throughout the world, which mostly relies on English-only sources. The English language can act as a watchman to scientific conversation, even if sharing worldwide a single language of science encourages the sharing of information across national and cultural borders (Tardy, 2004). Traditional mass media (such as newspapers and magazines), social media, and scientific publications disregard the cultures and viewpoints of non-English speaking groups by overlooking other languages. Even when communicating science in other local languages, such as Nepali in Nepal, this type of linguistic pressure may have resulted in the frequent use of English terminology.

3.3. Sentence Structure in Science Communication

Scientific writing frequently employs complex sentence structures, including the passive voice, which can make texts less engaging and harder to comprehend for the general public. Passive constructions are common in scientific literature because they emphasize results rather than researchers. However, studies suggest that simplifying sentence structures enhances readability and comprehension. Snow (2010) highlights the difficulties associated with academic language in science, pointing out that complicated grammatical structures and a wide vocabulary can make understanding difficult. Together, these findings highlight how important grammatical decisions are in forming scientific communication and imply that thoughtful evaluation of sentence structure and style might improve the impact and accessibility of scientific communications.

Effective science communication depends on clear, concise, and engaging structures that bridge the gap between scientific expertise and public understanding. Grammatical choices, particularly concerning sentence type and voice, have an important role in shaping the accessibility and impact of scientific messages. In support of a connectivity-based model of phrase memory, Gentner (1979) showed that verbs with greater semantic links between nouns improve sentence recall. This suggests that simple sentences, with their straightforward subject-verb-object structure, enhance comprehension and recall, especially for non-specialist audiences. Complex sentences, while offering greater flexibility for expressing intricate relationships, can overload cognitive processing and impede understanding. However, judiciously employed

complex sentences, with clear clause boundaries and logical flow, can be effective for conveying detailed information to more knowledgeable audiences. The active voice, where the subject performs the action, generally fosters clearer comprehension and reader engagement compared to the passive voice (Christie, 1999). According to research, the passive voice causes readers to become more psychologically detached from the text, which results in a more abstract interpretation of the content (Chan & Maglio, 2020). In the ongoing discussion about active vs passive voice in scientific writing, Inzunza (2020) argues in favor of the active voice because it is clear and succinct, even though it may be perceived as colloquial. Passive voice can be strategically employed in specific contexts, such as when the agent is unknown or irrelevant, or when emphasizing the result of an action Expert authors may find the passive voice to be a helpful tool, but its careless and overuse can worsen its detrimental effects on reader comprehension and engagement (Carpenter, 2022). Therefore, while deciding between active and passive voice structures, authors ought to carefully consider the context and objective.

In addition, long and complicated sentences may have confounding effects on readability and comprehension, according to related research. Scientists and engineers contend technical texts' intelligibility is most impacted by sentence structure. However, according to Glazer (1974), sentence length alone might not be a solid index of readability. Instead, while assessing and improving text readability, textual features like grammatical intricacy, structural indicators, and the specific requirements of different reader groups should be taken into consideration. Shorter sentences are often supposed to be easy to comprehend, especially in scientific articles. Expert communicators can help to reduce the gap between scientific ideas and public experiences by using analogies and metaphors (Niebert et al., 2012). The literature directs research attention to emphasizing the use of simple sentence structures and active voice in communicating science to society for optimal public intelligibility and public engagement, although tactical use of complex sentences, passive voice, and other stylistic choices can satisfy a need of more knowledgeable readers. This discussion manifests the importance of considering syntactic elements when communicating science to ordinary people.

3.4. Impact of Jargon on Public Perception

Venhuizen et al. (2019) focused their study on the terminology used in water and flooding and found that the experts and non-experts understand the terms significantly differently. Such differences in understanding can cause miscommunication leading to reduced engagement with scientific content. Similarly, Bullock et al. (2019) investigated as to how the frequent used jargon impact on public perspectives of ever-growing field of science and technology. Their research suggests that excessive use of jargon diminishes public grasp, increases perceived risks, and reduces public support of scientific achievements Simplifying language can bring about better public involvement and acceptance of new developments in science.

Bullock et al. (2019) described how jargon impacts public metacognitive processes, reducing their ability to gauge trustworthiness of scientific contents. Song et al. (2009) demonstrated that when information is harder to process, people tend to perceive it as riskier, which affects trust in scientific messages. Additionally, language fluency influences perceptions of credibility, as non-native speakers with strong accents are often deemed less trustworthy. Riggs et al. (2022) studied how technical language influenced COVID-19 vaccine communication. They found that jargon reduced message clarity and credibility, lowering public willingness to receive vaccines. However, they also discovered that adding infographics mitigated these negative effects, suggesting that visual aids can enhance comprehension and reduce resistance to complex scientific messages.

3.5. Readability and Public Understanding of Science Communication Texts

Readability is influenced by lexical and syntactic complexity. Bailin and Grafstein (2016) argue that the familiarity of vocabulary and sentence structure affects how easily a text can be understood. Just and Carpenter (1980) further support this by emphasizing that readability measures both lexical difficulty and sentence complexity.

Baram et al.'s (2020) study looked at the usage of jargon and readability in papers published in Public Understanding of Science during a thirty-year period. The findings indicated that science communication texts have become less readable over time, with an increase in technical language and the use of uncommon words. This kind of change hints at a growing communication gap between scientific knowledge and public understanding.

3.6. Strategy for Effective Science Communication

Studies have indicated that the frequent use of jargon and use of complex sentence structures coupled with passive voice hinders experts' communication with lay audiences. Willoughby et al. (2020) created an R script to measure technical terms in scientific publications and modify information according to the target audience. For various readerships, their findings set jargon thresholds. When speaking to public audiences, scientists tend to use less jargon, according to a standard measure for jargon use in spoken texts established by Sharon & Baram-Tsabari (2014). To detect jargon in written texts, Rakedzon et al. (2017) developed the De-jargonizer, a tool that was verified by comparison with pre-existing word lists and other studies. Their research showed that more jargon than was advised for general public comprehension was included in even plain summaries of scientific publications. When writing scientific information for audiences with different educational backgrounds, Funkhouser (1969) showed quantifiable variances. By minimizing the use of jargon, these studies jointly highlight the significance of customizing scientific communication to particular audiences.

This strategy provides an evidence-based way to customize scientific communication for various audiences. Science communicators can use a few crucial

tactics to increase public comprehension. Clarity can be improved by reducing passive constructs and substituting jargon with concepts that are widely understood. Short, straightforward phrases make writing easier to comprehend by dividing difficult concepts into manageable chunks. Additionally, as noted by Riggs et al. (2022), using visual aids like infographics and diagrams may reinforce textual explanations and improve understanding.

4. Conclusion

Scientific language is essential for precise communication within specialized fields, but it may pose challenges for broader public engagement. Jargon and complex sentence structures can hinder comprehension, reducing the effectiveness of science communication. Studies suggest that jargon minimization and audience-specific content adjustments improve public understanding.

The 2015 Gorkha earthquake made clear how vital it is to communicate effectively during disasters. According to Baniya (2022), technical communicators are essential in giving accurate information and refuting disinformation during emergencies. To avoid public fear and lessen vulnerability, communication must be clear, understandable, and grounded in science. The necessity of clear, concise disclosures and openness regarding ambiguities in seismology is emphasized by experts. To avoid false information and conflicting alerts, all earthquake-related communications should be supervised by a single, reliable government agency. Accurate reporting of scientific data and its interpretation should be taught to media workers.

Therefore, it becomes essential to explore how experts, such as earthquake scientists and engineers, convey information about earthquakes, with a particular focus on language aspects like technical jargon and the use of passive voice and complex sentence structures in the language they choose to communicate scientific and technological information to the ordinary people. Researchers can create an efficient language strategy to get past these barriers by looking at the language barriers of scientific communication. This type of activity might help close the gap between the general public and scientists by facilitating improved communication between the two groups and increasing public understanding of scientific topics. Future studies should concentrate on creating context-specific science communication language tactics for multilingual settings such as Nepal. This should involve evaluating the effects of bilingual science education, investigating how cultural variables affect how science communications are received, and examining how well scientific concepts translate into local languages. Multidisciplinary partnerships in research among linguists, scientists, and communication specialists can enhance public comprehension of scientific discovery in linguistically varied contexts and assist in closing linguistic gaps.

References

Adhikari, R., Dhungel, S. & Poudel, B. R. (2023). Science Communication and Role of

Media in Nepal. *Nepal Journal of Science and Technology* 22(1), 98-114.

Ando, M., Ishida, M., Hayashi, Y., & Mizuki, C. (2011). Interviews with survivors of Tohoku earthquake provide insights into fatality rate. *Eos, Transactions American Geophysical Union,* 92(46), 411-412.

Bailin, A., & Grafstein, A. (2016). Introduction to a New Approach to Readability. Readability: Text and Context, 1-9.

Baniya, S. (2022). How can technical communicators help in disaster response? *Technical Communication*, 69(2), 58–74.

Baram-Tsabari, A., Wolfson, O., Yosef, R., Chapnik, N., Brill, A., & Segev, E. (2020). Jargon use in Public Understanding of Science papers over three decades. *Public Understanding of Science*, 29(6), 644-654.

Broks, P., Gascoigne, T., Leach, J., Lewenstein, B. V., Massarani, L., Riedlinger, M., & Schiele, B. (2020). *Communicating science: a global perspective* (p. 994). ANU Press.

Brooks, C. F. (2017). Student identity and aversions to science: A study of translation in higher education. *Journal of Language and Social Psychology,* 36(1), 112-126.

Bucchi, M. (2008). Of deficits, deviations and dialogues: Theories of public communication of science. *In Handbook of public communication of science and technology* (pp. 71-90). Routledge

Bullock, O. M., Colón Amill, D., Shulman, H. C., & Dixon, G. N. (2019). Jargon as a barrier to effective science communication: Evidence from metacognition. *Public Understanding of Science,* 28(7), 845-853.

Burns, T. W., O'Connor, D. J., & Stocklmayer, S. M. (2003). Science communication: a contemporary definition. *Public understanding of science,* 12(2), 183-202.

Central Bureau of Statistics (CBS). (2021). *National Population and Housing Census 2021*. Kathmandu: Government of Nepal.

Carpenter, J. M. (2022). The Problems, and Positives, of Passives: Exploring Why Controlling Passive Voice and Nominalizations Is about More than Preference and Style. Legal Comm. & Rhetoric: JAWLD, 19, 95.

Carpenter, P. A., & Just, M. A. (2013). The role of working memory in language comprehension. *In Complex information processing* (pp. 51-88). Psychology Press.

Chan, E. Y., & Maglio, S. J. (2020). The voice of cognition: Active and passive voice influence distance and construal. *Personality and Social Psychology Bulletin,* 46(4), 547-558.

Corradini, M., Fallou, L., Bossu, R., & Roussel, F. (2021, April). Communicating in the aftermath of an earthquake: when Twitter proves to be a trustworthy and empathetic information channel. In *EGU General Assembly Conference Abstracts*

(pp. EGU21-147).

Doke, K., Yuan, Q., Gasco-Hernandez, M., Sutherland-Mitzer, M., Gil-Garcia, J. R., Bogdanov, P., & Zheleva, M. (2020). Supporting resilience in rural emergency preparedness and response through improved information access. *Get Mobile: Mobile Computing and Communications,* 24(2), 5-11.

Gordin, M. D. (2015). Hydrogen Oxygenovich: Crafting Russian as a language of science in the late nineteenth century. *History of Science,* 53(4), 417-437.

Grupp, G., Heider, M., & Day, S. B. (1975). Non-overlapping disciplinary vocabularies. *Communication of Scientific Information*. Basel: Karger, 28-36.

Hall, M. L., Lee, A. C., Cartwright, C., Marahatta, S., Karki, J., & Simkhada, P. (2017). The 2015 Nepal earthquake disaster: lessons learned one year on. *Public health*, 145, 39-44.

Joiner, T. A., Leveson, L., & Langfield-Smith, K. (2002). Technical language, advice understandability, and perceptions of expertise and trustworthiness: The case of the financial planner. *Australian Journal of Management*, 27(1), 25-43.

Kay, P., & Kempton, W. (1984). What is the Sapir-Whorf hypothesis? *American anthropologist,* 86(1), 65-79.

Kimura, R., Ohtomo, S., & Hirata, N. (2017). A study on the 2016 Kumamoto earthquake: Citizen's evaluation of earthquake information and their evacuation and sheltering behaviors. *Journal of Disaster Research,* 12(6), 1117-1138.

Krieger, J. L., & Gallois, C. (2017). Translating science: Using the science of language to explicate the language of science. *Journal of Language and Social Psychology,* 36(1), 3-13.

Márquez, M. C., & Porras, A. M. (2020). Science communication in multiple languages is critical to its effectiveness. *Frontiers in Communication,* 5, 31.

Massarani, L., Aguirre, C., Pedersoli, C., Reynoso Haynes, E., & Lindegaard, L. M. (2015). RedPOP: 25 years of a science communication network in Latin America.

Nelson, G., Ochocka, J., Griffin, K., & Lord, J. (1998). "Nothing about me, without me": Participatory action research with self-help/mutual aid organizations for psychiatric consumer/survivors. *American journal of community psychology,* 26, 881-912.

Niebert, K., Marsch, S., & Treagust, D. F. (2012). Understanding needs embodiment: A theory-guided reanalysis of the role of metaphors and analogies in understanding science. *Science Education*, 96(5), 849-877.

Priest, S. H. (2010). *Doing media research: An introduction*. Sage.

Rakedzon, T., Segev, E., Chapnik, N., Yosef, R., & Baram-Tsabari, A. (2017). Automatic

jargon identifier for scientists engaging with the public and science communication educators. *PLOS ONE*, 12(8), e0181742.

Riggs, E. E., Shulman, H. C., & Lopez, R. (2022). Using infographics to reduce the negative effects of jargon on intentions to vaccinate against COVID-19. *Public Understanding of Science*, 31(6), 751-765.

Sharma, S., Bajracharya R., and Sitaula B. (2009). Indigenous technology knowledge in Nepal—*a review*.

Sharon, A. J., & Baram-Tsabari, A. (2014). Measuring mumbo jumbo: A preliminary quantification of the use of jargon in science communication. *Public Understanding of Science* 23(5), 528-546.

Shulman, H. C., & Sweitzer, M. D. (2018). Varying metacognition through public opinion questions: How language can affect political engagement. *Journal of Language and Social Psychology 3*7(2),224-237.

Snow, C. E. (2010).Academic language and the challenge of reading for learning about science. *science* 328(5977), 450-452.

Song, H., & Schwar, N. (2009). If it's difficult to pronounce, it must be risky: Fluency, familiarity, and risk perception. *Psychological Science* 20(2), 135-138.

Tardy, C. (2004). The role of English in scientific communication: lingua franca or Tyrannosaurus rex ?. *Journal of English for academic purposes,* 3(3), 247-269.

Venhuizen, G. J., Hut, R., Albers, C., Stoof, C. R., & Smeets, I. (2019). Flooded by jargon: how the interpretation of water-related terms differs between hydrology experts and the general audience. *Hydrology and Earth System Sciences*, 23(1), 393-403.

Willoughby, J., et al. (2020). Assessing technical language levels in written scientific communication.