

Original Article

Technological Mediation of Human Relationships in the Digital Era

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ABSTRACT

Digital technologies have reshaped human relationships by transforming how people connect, communicate, and maintain social and professional bonds. Platforms like Facebook, Instagram, WhatsApp, and Zoom enable instant, global interaction, but also introduce challenges such as reduced authenticity, privacy concerns, digital loneliness, and algorithmic bias. This study analyzes the dual impact of digital mediation using an interdisciplinary approach, highlighting both its benefits (accessibility and connectivity) and drawbacks (emotional and social issues). It also examines the influence of AI and personalization on relationships. The findings suggest that digital technologies are neither entirely positive nor negative – their effects depend on user behavior and social context. The paper concludes that while these technologies enhance connectivity, they demand stronger digital ethics, emotional awareness, and relational skills.

KEYWORDS

Digital Communication, Technological Mediation, Human Relationships, Social Media, Artificial Intelligence, Digital Sociology, Human-Computer Interaction, Online Interaction, Virtual Communication, Digital Ethics.

1. INTRODUCTION

1.1. Background of the Study

The digital age has ushered in a new era of human connectivity, interaction and relationship building that is a clear evolution from the conventional methods of communication. In the past, relationships were largely nurtured through face-to-face interactions, through correspondence (in written forms) and through local communities, which limited the scale and pace of human interaction. But with the rapid pace of technological development in the Internet, mobile computing and social media, these constraints have been transformed. Distances are no longer a barrier to communication, enabling immediate interaction across geographical and temporal distances. In this new world, technology mediation has become an integral part of communication. Technology platforms like messaging apps, video calls and social networking sites are increasingly the main channels where people connect and communicate. These technologies not only convey information but also shape the perception of others, the expression of emotions and the nature of social interactions. Algorithms that curate content, instant messaging platforms, and interactive media types influence communication norms and regulate the visibility and regularity of social interactions. In turn, human relationships are increasingly initiated and maintained in technologically mediated spaces, where technology itself actively influences the form and content of human interaction.

1.2. Needs of Technological Mediation of Human Relationships

With the growing prevalence of technology in our lives, the mediation of social relationships through digital platforms has become the norm and a requirement in today's world. With increasingly global and accelerated social structures, traditional forms of communication are inadequate to meet the demands of interpersonal relationships. The role of technological mediation meets several key needs to support individuals and society in maintaining effective communication, emotional bonding and social activity in the digital environment.

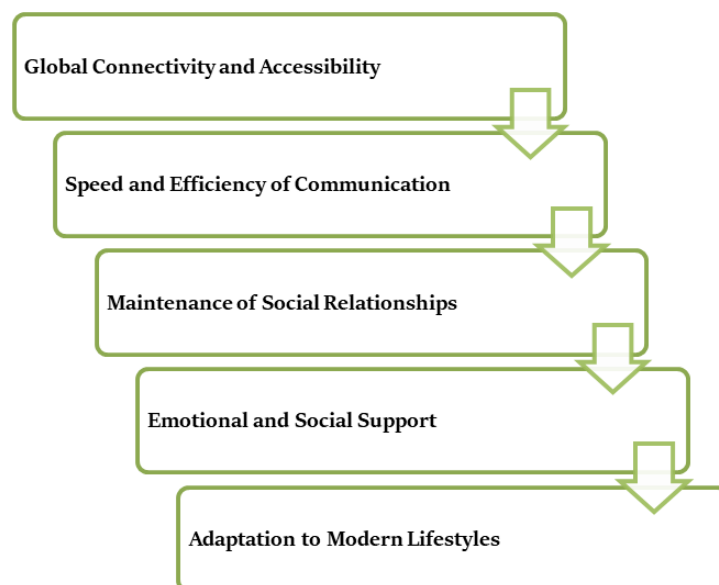


Fig 1 - Needs of Technological Mediation of Human Relationships

1.2.1. Global Connectivity and Accessibility

A key need for technological mediation is the need to facilitate communication across distance. The Internet removes the restrictions of distance, enabling instantaneous communication. This is essential for long-distance relationships, work collaboration and social connections across the globe.

1.2.2. Speed and Efficiency of Communication

The fast-paced world demands quick information sharing, which is not always possible through traditional means. Instant messaging, email, and videoconferencing services allow for immediate communication, facilitating real-time communication and quicker decision making in personal and professional relationships.

1.2.3. Maintenance of Social Relationships

Technology enables people to maintain relationships for longer, even when face-to-face interaction is impossible. Social media and messaging apps facilitate ongoing connection via messages, updates and content sharing, which helps to sustain emotional and social connections.

1.2.4. Emotional and Social Support

Social media platforms also provide a platform for emotional support. Users can express feelings, seek and receive support from their networks, which helps to enhance well-being and reduce loneliness.

1.2.5. Adaptation to Modern Lifestyles

In a world of busy lives and on-the-go lifestyles, technology offers flexible modes of communication. From texting to online meetings, communication can occur in the most convenient manner, regardless of geographical distance.

1.3. Mediation of Human Relationships in the Digital Era

In the digital age, human relationships are increasingly mediated and maintained through digital technologies, which are transforming the dynamics of interpersonal communication and interaction. Mediation is the process by which digital technologies play the role of intermediary in shaping how relationships develop, are sustained and navigated. While in-person communication is direct, and includes non-verbal elements such as facial expressions, body language, and tone, digital mediation involves the use of text, images, emojis, and algorithmically filtered information. This has profound implications for how we express and perceive emotions and relationships. Digital media such as social media, instant messaging and video calls are key settings for relationship-building. These technologies not only facilitate communication but regulate it through technological design and algorithms. For instance, algorithms regulate what users view, and push notifications regulate the frequency and timing of interactions. This means that relationships are no longer only created by humans but also co-produced by technological platforms that facilitate interaction. Moreover, digital mediation has increased connectivity and speed of interaction. People can now have extensive

networks of contacts and interact with them constantly, regardless of geographic proximity. But this connectivity is often accompanied by a loss of emotional intensity and authenticity. Relationships might be more frequent but less substantive due to the fragmented, short-lived nature of communication and the constraints of the digital environment. Additionally, social identity and perceptions are mediated online. People present themselves online, filtering what information is disclosed, which may affect relationship dynamics and perceptions. This self-curation, together with the filtering that is done by algorithms, alters social reality in the online world in comparison to offline social interactions. In essence, the mediation of social relationships in the digital age is a complex interaction between technology and human interaction, which is shaping the way people interact, communicate and experience emotions in the modern world.

2. LITERATURE SURVEY

2.1. Theoretical Foundations

The foundations for the influence of media on perception and social dynamics were established by early communication theorists. Marshall McLuhan's oftencited maxim that "the medium is the message" suggests the medium of communication is more important than its content. This view implies that every medium of communication reconfigures human thoughts, actions and interactions. This is especially powerful in digital platforms, where communication is no longer passive but is mediated by computational processes. Interfaces, algorithms, and platform structures mediate interactions, influencing user perceptions and behaviour, thus bringing McLuhan into the digital era.

2.2. Social Media and Relationship Dynamics

Social media networks like Facebook and Instagram have changed how people connect and build relationships through increased access and interaction. These technologies improve global connectedness and enable people to maintain extensive social networks, but studies indicate that these interactions are superficial. Rather than engaging in meaningful interactions, users often engage in short interactions like liking, commenting, and sharing. Furthermore, the presentation of "ideal" lifestyles of others promotes social comparison, which is the tendency to compare oneself to others. This may result in psychological outcomes such as lowered self-esteem, anxiety and feelings of inferiority, especially for younger and more susceptible users.

2.3. Digital Intimacy and Emotional Expression

The use of digital communication technologies has changed how emotions and intimacy are expressed. When interacting in person, a variety of emotional cues - visual (facial expressions) and auditory (tone of voice) - are essential for communication. However, in digital communication, text messages, emojis, GIFs and the ability to "react" to messages stand in for these cues. Although these elements can amplify emotional expression by offering users new avenues to express emotions in a fast and imaginative way, they can also create confusion. For example, an emoji could be misinterpreted based on context, culture or individual understanding. Thus, online intimacy is a

mixture of certainty and ambiguity where emotions can be enhanced or depleted through different media.

2.4. Algorithmic Mediation

Algorithmic mediation is a key factor in contemporary social interactions, as it controls the content users encounter and the people with whom they connect. Algorithms are employed by social media platforms to curate user feeds according to their interests, interactions, and past activities. This not only improves the user experience by delivering more relevant content, but also has other effects. A key consequence is the creation of "filter bubbles", in which users are exposed primarily to content that confirms their existing beliefs and opinions. Likewise, "echo chambers" serve to entrench these views through the repetition of information and lack of viewpoints. In the long run, this may lead to lower relational diversity, lack of exposure to alternative perspectives and affect how people understand social reality and relationships.

2.5. Gaps in Literature

Although research on social media, digital communication and communication theory is extensive, there are a few gaps. A key gap is the need for more integration of artificial intelligence-based communication approaches within sociological theories. With the growing role of AI in human communication, through chatbots, algorithms, and generative models, there is a need for more holistic examination of its societal implications. Furthermore, much of the current research is oriented toward short-term behavioral impacts, rather than the long-term sustainability of relationships, which raises questions about the long-term impact of digital communication on relationships. Lastly, there is no interdisciplinary perspective that integrates sociology, psychology, and computational theory to explain the nature of digital relationships.

3. METHODOLOGY

3.1. Research Design

This research follows a qualitative conceptual design, complemented with secondary data, to examine the impact of digital communication on social relationships in the modern era. The qualitative conceptual design is suitable for this study as the research does not involve quantitative measurement and analysis, but rather involves understanding, interpreting, and synthesising theories, models, and academic debates around digital communication, social media use and algorithmic mediation. The study's conceptual approach facilitates the integration of several theoretical viewpoints, such as communication theory, sociology, and computational media studies, to create a more comprehensive and cohesive view of the topic. Further, this research involves secondary data analysis, which means that all data and information used in the study is sourced from previously published academic literature including journal articles, books, conference proceedings and reliable reports. This allows the researcher to draw on a broad spectrum of empirical evidence and theoretical perspectives without the need to gather primary data (such as through surveys or experiments). Secondary data analysis is helpful in this study because it facilitates the integration of substantial amounts of data from multiple studies, enabling the researcher to discern patterns,

commonalities and inconsistencies among different research findings. The research design also highlights the use of thematic analysis, which involves identifying and analysing themes such as social media use, emotional displays, algorithmic effects and relationship dynamics across multiple studies. By categorising the literature conceptually, the study offers a conceptual framework for understanding the impact of digital platforms on human interaction. Moreover, this approach facilitates critical evaluation by enabling the researcher to compare different perspectives and inconsistencies or gaps in the literature. In summary, the qualitative conceptual research design and secondary data analysis provide a holistic and interpretative approach to understanding digital communication phenomena, making it appropriate for the study of the changing nature of technology-based relationships.

3.2. Data Collection Methods

This research adopts a secondary source data collection method, using a variety of reliable academic, professional and industry-based information to gain a holistic understanding of digital communication and its effects on interpersonal relationships. The main approach is academic journal review, where peer-reviewed publications from reputable databases like Scopus, Google Scholar, and Web of Science are analysed. These journals offer empirical research, theoretical insights, and critical analyses of social media use, communication patterns, emotional displays and the role of algorithms. Through the examination of these academic articles, the research guarantees the use of peer-reviewed and credible sources. Alongside academic journals, reports from digital communication platforms are also used as a source of information. These reports provide insights into the data collected by, and the policies of, the major social media platforms like Facebook, Instagram, X (formerly Twitter), and other social networking platforms. These reports provide valuable information on user behaviour, content distribution, and algorithms, which are crucial to understanding the role of digital platforms in shaping social interactions in the real world. Additionally, sociological and psychological studies are integrated to address the human, social and psychological aspects of digital interaction. These reports offer valuable insights into social comparison, digital addiction, well-being, and identity construction, among other topics. By drawing on sociological and psychological studies, the research can explore both micro and macro effects of digital communication. Finally, industry white papers from technology firms and research groups are also included to offer practical insights into new developments in digital interaction. These papers typically focus on innovations in technology, the role of artificial intelligence and predictions for the future of social media. In this way, these varied data sources contribute to a rich tapestry of information that informs the study from multiple perspectives, enabling it to draw both theoretical and practical insights about the research question.

3.3. Analytical Framework

The foundation of this study's analytical framework is a blend of thematic analysis and systems thinking, which offers a holistic view of relational mediation in digital communication settings. Thematic analysis is employed as the main approach to analyse and organise the qualitative data gathered from literature, journal articles and reports. Using this method, patterns, themes, and concepts associated with digital communication are identified, coded, and grouped into themes.

Themes like social media use, emotional sharing, algorithmic effects, digital intimacy, and relationship dynamics are identified and extracted from the literature. This enables a systematic analysis of complex and varied academic work, facilitating comparative discussions and highlighting agreements or contradictions between studies. Alongside thematic analysis, systems thinking is used to explore the interconnectedness of digital communication systems. This approach allows the research to consider the interplay between various system elements, such as users, platforms, algorithms, and social processes, within a complex and dynamic system. This emphasises the feedback loops, interdependencies and non-linear dynamics that occur in online interactions. For instance, user actions shape algorithmic suggestions, which then impact user actions in a feedback loop. This approach allows the study to reflect the complexity of digital settings where the relational outcomes are not only influenced by isolated elements, but also by the interrelationship between system components. The use of thematic analysis and systems thinking enhances the analytical approach, bringing together micro-level qualitative interpretation with macro-level understanding of digital systems. Thematic analysis offers specificity and detail in the articulation of key concepts while systems thinking provides a broader understanding of how these concepts function in complex systems. This facilitates a rich and multifaceted understanding of the role of digital communication technologies in mediating interpersonal relationships in today's world.

3.4. Digital Relationship Mediation Flowchart

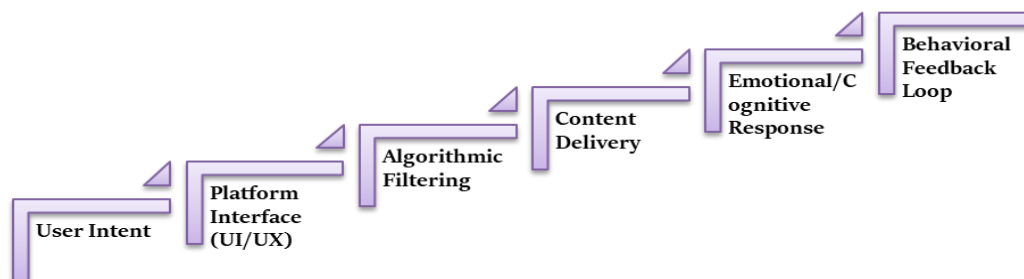


Fig 2 - Digital Relationship Mediation Flowchart

3.4.1. User Intent

User intent is the first step in digital interaction, where a user interacts with a platform for a particular purpose, such as communication, information, entertainment or social interaction. This can be active, like communicating with a friend, or latent, like content consumption with no specific goal. User intent is influenced by individual needs, emotions, and social needs, and serves as the basis for all other digital interactions. It shapes the nature of user interactions and affects user perceptions and reactions to digital content.

3.4.2. Platform Interface (UI/UX)

The platform interface, or user interface (UI) and user experience (UX) design, is the vehicle for expressing user intent. This comprises media layout, navigation, visual design and interactive

elements, such as buttons, feeds, and notifications. The interface helps direct user actions by making some behaviours easier than others. UI/UX design has a significant impact on user engagement, as it affects how readily users can access information and communicate with each other, which in turn impacts their communication and relationship building.

3.4.3. Algorithmic Filtering

Algorithmic filtering is the automated process by which digital platforms organize, prioritise and personalise information for users. Algorithms consider user interests, interactions, and history to decide the content displayed on user feeds. This step plays a crucial role in determining visibility and engagement through the selection of relevant posts, messages or updates. This means that users are more likely to receive content that matches their interests and habits, impacting their views and social behaviours.

3.4.4. Content Delivery

Content delivery is the phase where selected information, messages and media are delivered to the user. This can be updates from friends, advertising, promoted content and algorithmically curated media. The type of content presented is crucial in informing user consumption. This shapes the type of information that is accessed and the frequency with which users engage with particular people, or topics, and therefore social dynamics and exposure.

3.4.5. Emotional/Cognitive Response

Users mentally and emotionally respond to the content at this point. These include happiness, envy, interest, social approval or disappointment, among other reactions. Users also engage in cognitive appraisal, evaluating meaning, relevance and social comparisons. These feelings and thoughts have implications for users' perceptions of relationships and social identity in digital environments.

3.4.6. Behavioral Feedback Loop

The behavioral feedback loop is the final phase of the process and involves user reactions impacting future interaction with the platform. User actions like likes, shares, comments, or non-interaction are tracked and inform the algorithms that provide content recommendations. This establishes a feedback loop where user actions influence the content they see, reinforcing specific patterns of engagement. The feedback loop is crucial to the development and personalisation of digital relationships.

3.5. Variables Considered

This research explores the link between digital communication and personal relationships through the consideration of variables that play a role in this connection. The independent variable under investigation in this study is digital platform usage, defined as the patterns of frequency, intensity, and mode of engagement of individuals with digital communication platforms, such as social media. This encompasses messaging, consuming, posting, commenting and engaging with

algorithmically driven feeds. The characteristics of this variable significantly impact how relationships are established, sustained, and experienced online. Greater usage typically results in more exposure to mediated communication, which can impact communication dynamics and emotional relationships. The outcome variable is relationship quality, defined as the quality of human relationships in terms of their depth, stability, satisfaction and emotional intimacy. These relationships are both online and offline, given the blending of digital interactions into real-life connections. This variable is measured by trust, emotional support, effective communication and overall relationship satisfaction. The study aims to explore how differences in digital platform usage affect these aspects, both in terms of enhancing connectedness and contributing to "thin" social interactions and emotional detachment. Along with the main variables, there are moderating variables that affect the magnitude and direction of the relationship between digital platform usage and relationship quality. Age is a key moderator, as younger people use digital platforms differently to older people, with younger people more likely to be immersed in digital communication than older adults. Another moderating variable is digital literacy, which enables users to navigate and interpret the digital environment more effectively. Cultural factors are also important, as cultural norms and values influence communication patterns, emotional expressions and technology use. These factors offer a framework for understanding the impact of digital environments on human relationships, as well as variability in user experiences.

4. RESULTS AND DISCUSSION

4.1. Observational Insights

The observational study of the literature and conceptual analysis suggests a mixed influence of technology mediation on relationship dynamics. Firstly, technological platforms of communication greatly increase connectedness, allowing people to communicate more often, more quickly, and over long distances. Social media platforms, instant messaging and virtual communities enable individuals to have extensive social networks and be constantly informed about the activities of others. Such convenience facilitates communication in a way that is continuous and less constrained by time and distance, making it easier to maintain social connections. This leads to a greater quantity of social interactions for users than in times before digital communication. But despite this heightened connectivity, the quality and emotional intimacy of relationships is argued to be reduced in some relational aspects. Numerous studies and user testimonies indicate that the communication that occurs through digital media is short, fragmented, and shallow. Interactions are often limited to brief messages, likes, emojis or short comments, which may not convey the depth of emotions experienced in face-to-face interactions. This helps create a sense of relational thinness, where people may remain connected but have fewer in-depth and emotionally satisfying interactions. Moreover, users often report a paradoxical feeling of being more socially connected online but less emotionally fulfilled in their relationships. The filtered content and romanticised portrayal of others' experiences can lead to feelings of envy, deficiency, or emotional numbness. Although technology offers more chances for contact, it can also weaken emotional expression, resulting in relationship fatigue or shallowness. In sum, the research indicates that digital platforms broaden communicative networks, but also modify the relational context. This combination underscores the importance of considering

not just the quantity of communication in the online environment, but also its quality and emotional satisfaction.

4.2. Result Table

Table 1: Result Table

Dimension of Relationship Impact	Positive Impact (%)	Negative Impact (%)
Communication Speed	92%	8%
Emotional Depth	41%	59%
Social Connectivity	88%	12%
Privacy Concerns	35%	65%
Relationship Stability	54%	46%
Digital Dependency	78%	22%

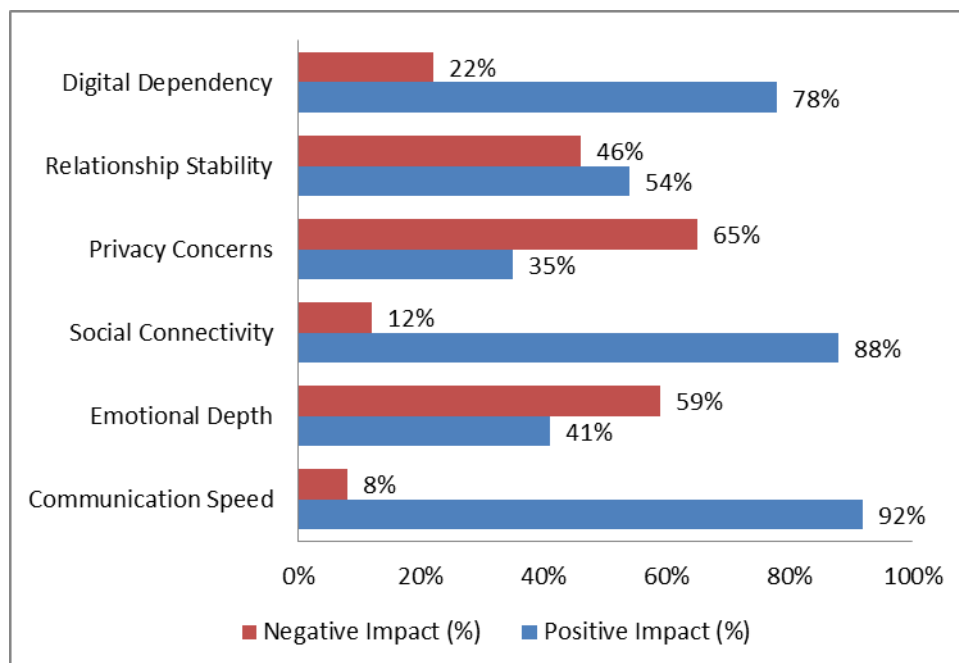


Fig 3 - Result Table

4.2.1. Communication Speed

The findings suggest a very high positive impact (92%) on the speed of communication, and a very low negative impact (8%). This indicates that digital technologies have greatly increased the speed of communication over distances. Texts, phone calls and notifications are received in real-time, allowing instant communication across distances. But the low negative percentage suggests there are some drawbacks, such as delays in communication caused by poor connectivity or the expectation of instant replies, potentially causing stress.

4.2.2. Emotional Depth

Emotional depth has a relatively low positive percentage (41%) and higher negative percentage (59%) suggesting a loss of emotional depth in online interactions. Although participants

can convey emotions through text, emojis, and multimedia, these methods may not convey the same range of emotions as face-to-face emotions. This could potentially lead to less meaningful interactions, emotional confusion and dissatisfaction with relationships.

4.2.3. Social Connectivity

Social connectivity exhibits a high positive impact (88%) and low negative impact (12%) and shows the social benefits of digital platforms in terms of sustaining social connections. People can easily keep in touch with friends, family and colleagues. But the negative side indicates concerns that some of these relationships can be shallow, lacking depth or long-term engagement, despite regular online interactions.

4.2.4. Privacy Concerns

There is a more negative (65%) than positive (35%) impact of privacy concerns, suggesting users are increasingly concerned about issues such as data privacy, security and access control. While some are enjoying services, others are concerned about how personal data is gathered, stored and used by online services, resulting in diminished trust in the networked environment.

4.2.5. Relationship Stability

Relational stability is a mixed result, with 54% positive and 46% negative. This implies that digital communication can have positive and negative impacts on relationships. Although staying connected facilitates relationship maintenance, overuse, misinterpretation and digital distractions can also lead to relationship instability in some instances.

4.2.6. Digital Dependency

Digital dependency has a high positive effect (78%) and a moderate negative effect (22%) due to increasing dependency on digital tools for social interaction and communication. This dependency improves convenience and increases social access, but also concerns the overuse, diminished face-to-face communication and possible addictive effects of digital media.

4.3. Discussion

4.3.1. Enhancement of Connectivity

Online media has revolutionised communication by increasing connectivity on a local and global scale. What used to take time, effort and physical proximity can now happen in real time via instant messaging software, social media sites and video conferencing. This efficiency enables people to remain in constant touch with their networks of friends, family and colleagues across long distances. This makes maintaining relationships over distance more feasible, and enables people to build social connections beyond traditional geographical and social barriers, creating a more connected world.

4.3.2. *Decline in Emotional Depth*

While online tools increase the volume of communication, they also lead to a decreased emotional intensity in relationships. Without the physical proximity, facial expressions, vocal tones and other body language, communication becomes less rich. This can result in shallower or misinterpreted emotional interactions. Although emojis, stickers and other multimedia content are used to make up for this, they cannot replicate the depth of non-verbal communication used in face-to-face interactions, creating an emotional distance in online communication.

4.3.3. *Algorithmic Influence*

Algorithms significantly influence individuals' online relationship experiences by shaping the information and social connections they are exposed to. Algorithms prioritize content based on user preferences, interactions, and prior exposure, which can lead to a lack of diversity in content. This may result in relational filtering, where users are exposed to similar opinions and networks. This leads to a decrease in interaction diversity and perpetuates existing cognition and social structures.

4.3.4. *Digital Fatigue*

The pressure to engage online can result in digital fatigue, which involves cognitive overload, a shorter attention span and emotional blunting. The constant flow of notifications, messages, and content updates leads to feelings of pressure to be online. Information overload can have negative implications on cognitive performance and interpersonal communication, as people can become distracted or overwhelmed with too much digital information.

4.3.5. *Socio-Technical Imbalance*

Another critical issue is socio-technical disconnect between human emotions and machine-enabled communication platforms. Users desire authentic, empathetic and emotional interactions, but digital platforms are built for engagement maximisation and data-driven communication. This imbalance leads to relational dissonance, as users engage with systems that favour efficiency and engagement metrics over emotional connection, resulting in issues with sustaining healthy and balanced relationships.

5. CONCLUSION

The mediatisation of relationships is a complex and multifaceted phenomenon with both positive improvements in connection and drastic changes in how relationships unfold. Technology-mediated communication has a profound impact on the way individuals initiate, sustain and experience relationships due to the removal of temporal and spatial constraints. Instant messaging, social networking, and real-time multimedia communication technologies enable a constant state of interaction across global networks, thus increasing accessibility and social connectivity in new ways. This has created a more connected world in which relationships can be initiated and sustained in a more efficient manner than before.

Yet, in parallel to these gains, the research identifies a number of risk factors in technologically-based communication. Although the speed and volume of interaction have heightened, there is also evidence for a loss of emotional authenticity and intimacy in relationships. The decline in face-to-face communication and the use of digital symbols (text, emojis, and reaction-based systems) in digital communication can restrict the emotional depth of communication. Moreover, privacy, security, algorithmic manipulation and psychological factors further complicate online interactions. Social comparison, emotional exhaustion and over-reliance on digital rewards, among other factors, affect the quality of relationships.

Thus, this research concludes that digital mediation should not be viewed as either a positive or a negative absolute. Rather, technological mediation has a relational function that is contingent and dependent on factors such as technological design, user practices, technological literacy and cultural environment. Digital communication has fluid effects, with both positive and negative impacts on relationships. So, the onus for better relational outcomes does not lie solely with users, but also designers, policy makers and technology developers of digital platforms.

Future developments in artificial intelligence, immersive media and algorithms are likely to further mediate the experience of relationships. This is likely to enhance both the potential for greater social connectedness and the risks of emotional disconnection and moral concerns. So, there is a need for stronger frameworks to support digital literacy, ethical design of platforms and technologies, and responsible technology usage. These frameworks are crucial to ensure that technological advancements contribute to the positive functioning and sustainability of human relationships in a digital age.

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