
Perspective

The Reconfiguration of Social Bonds in the Digital Age: Virtual Connections vs. Face-to-Face Relationships

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ABSTRACT: The article examines how smartphones and social media are transforming human interactions, challenging traditional concepts of friendship, intimacy, and belonging. Phenomena such as “phubbing” and constant connectivity are explored, highlighting the negative impacts of hyperconnectivity on the quality of face-to-face interactions and emotional well-being. While these technologies expand the reach of connections, they often lead to more superficial relationships, altering family, educational, and professional dynamics. Anthropological analysis is emphasized as essential for understanding these changes, revealing how digital practices vary across different cultural and social contexts. Ethnographic studies and innovative methodologies are suggested to investigate how digital technologies reshape identities, communities, and social hierarchies. The importance of an interdisciplinary approach, combining anthropology, psychology, and data science, is underscored to address the emerging challenges of the digital era and foster more authentic and healthy human relationships.

Keywords: Digital relationships; Phubbing; Hyperconnectivity; Digital anthropology; Face-to-face interactions



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1. Introduction

The rise of smartphones and social media has profoundly transformed human interactions, challenging and reshaping traditional concepts of friendship, intimacy, and belonging [1,2]. These digital technologies have become central mediators of social relationships, redefining how individuals build and maintain connections across diverse cultural and social contexts [3–5]. At the same time, new interaction dynamics are emerging, not only expanding communication possibilities but also reconfiguring values and practices, emphasizing the need for anthropological investigations to understand the impacts of these digital mediums on contemporary forms of sociability [6,7].

From an evolutionary perspective, social interactions have played a central role in human survival and development [8]. The process of primary socialization, which takes place during childhood and is fundamental to the construction of identity and the formation of emotional bonds, has traditionally been mediated by face-to-face interactions [9]. However, the rise of digital devices has altered this landscape, restricting fundamental experiences essential for emotional and cognitive development. The absence of eye contact, the impoverishment of verbal interactions, and the reliance on screen-mediated communication may undermine crucial social skills, such as empathy and the ability to interpret others' emotions. These changes are far from trivial, as they impact the very evolutionary mechanisms that have facilitated the consolidation of human societies throughout history.

These changes also significantly impact family relationships, creating new challenges for coexistence. Family members often isolate themselves in their rooms or even in each other's presence, preferring to interact with digital devices rather than share moments of face-to-face connection [10]. In social settings outside the home, such as restaurants or gatherings, an interpersonal disconnection is frequently observed, as individuals remain engaged with digital networks, with little to no meaningful interaction among themselves [5,11].

The impact of digital technologies extends to the educational environment, where schools and classrooms face the challenge of balancing the pedagogical use of technological tools with the negative effects of excessive usage [12]. Students, and even teachers, often struggle to disconnect, creating an atmosphere of friction and difficulties in the teaching and learning process [13]. Excessive attention to devices can disrupt concentration, engagement, and interaction dynamics within the school setting, exacerbating obstacles to building a productive and harmonious educational environment [14].

The global health crisis caused by the COVID-19 pandemic brought to light and intensified social dynamics that were already being shaped by digital mediation, revealing new layers of complexity in human relationships [15,16]. Social isolation imposed during the pandemic heightened dependence on digital technologies as the primary means of interaction, turning apps and social networks into essential channels for maintaining connections [17,18]. This reliance, however, also underscored challenges related to mental health, including loneliness, anxiety, and difficulties in achieving deep communication [19]. Although the trend of social isolation had already been underway due to the predominance of digital interactions, the pandemic exacerbated these patterns, creating a new normal in which physical distancing perpetuated a reality of predominantly screen-mediated interactions [20]. This situation highlights the need to understand the implications of these shifts for contemporary sociability, as well as the long-term effects on how individuals connect and experience intimacy and belonging.

These scenarios underscore the urgency of investigating how digital technologies are reshaping not only individual relationships but also collective interaction structures, such as family and educational environments.

2. The Impact of Smartphones and Social Media on Interpersonal Bonds

The intensive use of smartphones and social media platforms has significantly altered the dynamics of interpersonal relationships. Studies suggest that communication mediated by digital devices can diminish the quality of face-to-face interactions, impacting the depth of human connections. The phenomenon known as ‘phubbing’—ignoring those nearby in favor of smartphone use (Figure 1)—illustrates how divided attention can weaken social bonds [21,22].

‘Phubbing’ has emerged as one of the most prominent phenomena associated with the rise of digital technologies. This practice reflects profound changes in contemporary social dynamics, marking a shift away from full attention in face-to-face interactions and a transfer of intimacy to digital devices [23,24]. While smartphones provide uninterrupted connectivity, they also create invisible barriers to human interactions, negatively impacting the quality of interpersonal relationships, particularly in family, academic, and professional settings [25].

The reconfiguration of family interactions due to the intensive use of mobile devices has direct implications for child development. Studies indicate that children whose parents devote more time to their smartphones during direct interactions exhibit difficulties in language development and lower social engagement [26,27]. Most young children show signs of stress or frustration when their parents prioritize phone use during moments of interaction [28]. Moreover, excessive smartphone use by caregivers is directly linked to an increase in negative behaviors in children, such as tantrums, hyperactivity, and emotional difficulties [29,30].

Studies indicate that ‘phubbing’ has significant implications for mental health and emotional well-being. It is associated with feelings of exclusion, reduced relationship satisfaction, and increased interpersonal conflicts [22,31]. In romantic contexts, for instance, the constant use of smartphones during shared moments can lead to feelings of neglect and emotional dissatisfaction, undermining perceptions of mutual support and intimacy between partners [32,33]. Similarly, in family settings, this practice can weaken the bond between parents and children, compromising the development of emotional connections and healthy communication [34].

The phenomenon of ‘phubbing’ has profound impacts on the mother-child relationship and primary socialization processes [35,36]. Eye contact and parental responsiveness are fundamental for the development of secure attachment, a crucial aspect of developmental psychology. However, the fragmentation of attention due to the constant use of digital devices can hinder the formation of this bond. Research indicates that infants whose parents frequently use their smartphones during direct interactions exhibit lower emotional responsiveness and delayed language development [37,38]. This phenomenon is even more concerning when observed during early childhood, a critical period for the development of social and cognitive skills.

Beyond its emotional impact, ‘phubbing’ also has broader consequences for social dynamics (Figure 1). In academic settings, it is identified as a factor that affects concentration, classroom interaction, and student engagement with in-person activities [39,40]. In workplace environments, this practice can undermine productivity and team cohesion, as continuous partial attention hinders the development of trust and the effective resolution of group problems [41].

From an anthropological perspective, ‘phubbing’ illustrates how digital devices are reshaping everyday practices, establishing new behavioral norms that often conflict with traditional values of face-to-face interaction. This practice highlights a paradigmatic shift in the allocation of attention, revealing a tension between physical and digital presence that calls for further scientific investigation [23,24]. Through cultural and ethnographic studies, it is possible to understand how ‘phubbing’ manifests in different social and cultural contexts and the meanings individuals assign to this behavior.

For Anthropology, ‘phubbing’ emerges as an essential and evolving object of study for understanding the cultural and social impacts of digital technologies. This phenomenon not only transforms daily practices but also redefines fundamental concepts of presence, attention, and intimacy crucial to human interactions. By acknowledging “phubbing” as a field of analysis, anthropology can explore how these changes unfold across diverse sociocultural contexts, mapping variations in the meanings attributed to this behavior and the adaptive strategies employed by communities. Such an approach sheds light on how contemporary technologies are reconfiguring traditional values and creating new paradigms in social relationships.

Finally, ‘phubbing’ represents not only a challenge to interpersonal relationships but also an opportunity to reflect on the conscious use of digital technologies. Developing strategies to mitigate its negative impacts, such as promoting awareness campaigns and intentional disconnection practices, is essential to balance the benefits of digital connectivity with the need for meaningful human interactions.



Figure 1. The image illustrates ‘Phubbing’, where individuals in close physical proximity ignore each other in favor of digital interactions. The disconnection in the digital age: Physically close yet emotionally distant, the scene symbolizes the impact of smartphones and social media on interpersonal bonds. The cold glow of screens highlights the growing divide between them, emphasizing how technology can isolate rather than unite. This image was created with the assistance of the DALL·E artificial intelligence.

3. Reconfiguration of Friendship and Intimacy

The digital revolution, driven by the proliferation of smartphones and social media, has profoundly reconfigured traditional notions of friendship and intimacy (Figure 2) [1]. Digital platforms provide an unprecedented ease in establishing and maintaining social connections, enabling individuals to cultivate a significantly larger number of relationships than would be feasible in offline contexts [42,43]. However, this quantitative expansion does not always translate into emotional depth or meaningful intimate bonds [44].

Studies suggest that while social media expands the reach of connections, it often results in more superficial interactions [45]. The nature of these platforms tends to favor brief and public communications, which can limit the depth of interactions and, consequently, the formation of intimate bonds [46]. Additionally, constant exposure to

information about others' lives may lead to social comparisons and feelings of inadequacy, negatively impacting the perception of intimacy and satisfaction in personal relationships [47].

Adolescence is a crucial period for the development of social identity, and the rise of digital interactions has profoundly transformed this stage of life. Recent studies indicate that adolescents who spend more time interacting virtually rather than in person exhibit lower levels of empathy and a reduced ability to read emotional cues [48,49]. Data suggest that young individuals who excessively use social media for more than three hours per day report feelings of loneliness and dissatisfaction with their personal relationships [50,51]. This reconfiguration of digital friendships and intimacies may affect the maturation of socio-emotional skills, limiting the depth and authenticity of interpersonal bonds.

Digital anthropology emphasizes that the quality of face-to-face interactions remains crucial for the development of intimate bonds [52]. In-person communication allows for the reading of nonverbal cues, such as facial expressions and body language, which are essential for building trust and empathy [53,54]. These elements are often absent or diminished in online interactions, potentially limiting the depth of connections formed in digital environments [5].

The management of identity on social media, where individuals often present idealized versions of themselves, can create barriers to forming authentic relationships [55,56]. The careful curation of shared information can lead to distorted perceptions and unrealistic expectations, hindering the development of genuine intimacy [57].

Anthropology, when addressing contemporary transformations in human relationships, must acknowledge the emergence of algorithm-based applications and programs that foster affective connections as a new and significant subject of study. These platforms not only redefine how connections are initiated and maintained but also raise new questions about how intimacy and friendship are mediated by digital technologies [58,59]. Anthropological analysis of these tools can uncover how affectionate relationships are shaped by algorithmic logic, highlighting the cultural, emotional, and ethical implications of this reconfiguration. Understanding this phenomenon is crucial to broadening the debate on the social and subjective impacts of technological mediation in human relationships.

While social media provides valuable opportunities for maintaining connections and expanding social networks, it cannot replace the depth and quality of face-to-face interactions essential for developing meaningful friendships and intimacies (Figure 2) [52,60]. Understanding these dynamics is crucial for navigating the contemporary social environment in a healthy way, balancing online and offline interactions to foster authentic and fulfilling relationships [61].

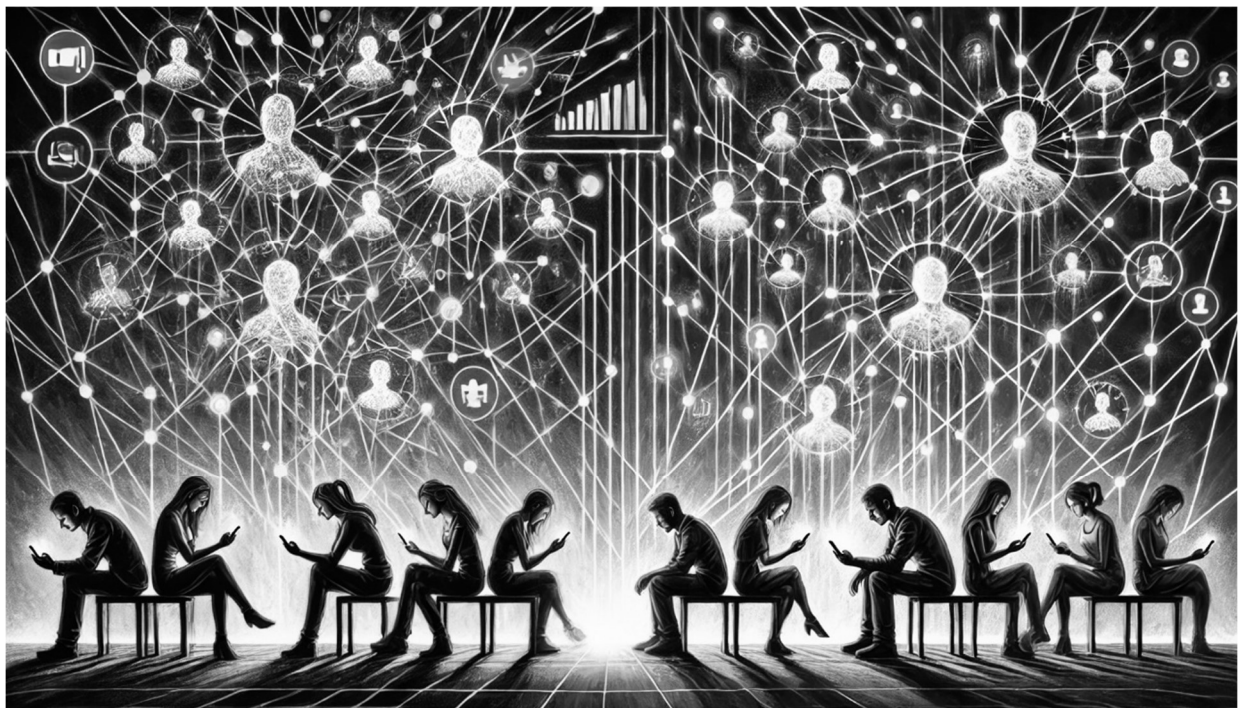


Figure 2. The Reconfiguration of Friendship and Intimacy in the Digital Age: As online connections multiply, face-to-face emotional bonds weaken, illustrating the tension between quantity and depth in contemporary relationships. This image was created using DALL·E artificial intelligence.

4. Consequences of ‘Constant Contact’

The constant connectivity provided by smartphones has profoundly transformed the dynamics of human interactions, creating a state of ‘constant contact’ that impacts both individuals and their social relationships (Figure 3). From an anthropological perspective, this phenomenon can be understood as an extension of physical presence, where digital availability is perceived as a means of maintaining social bonds, yet it often leads to emotional and social overload [44,62]. The pressure to remain continuously available and to respond promptly to messages generates what some researchers term ‘connectivity fatigue’, characterized by stress, anxiety, and a sense of exhaustion in the face of digital social demands [63].

Constant exposure to digital interactions also impacts concentration capacity and time perception. The phenomenon of ‘connectivity fatigue’ has been increasingly documented in psychological studies [64]. Research reveals that individuals who check their smartphones every few minutes experience a significant decline in their ability to focus on prolonged tasks [65]. Moreover, excessive connectivity is associated with increased levels of anxiety and stress, as the lack of breaks in digital communication prevents the cognitive and emotional regeneration necessary to maintain a healthy balance in social life [66].

The social overload caused by constant contact is not homogeneous; it varies depending on cultural contexts and social norms of connectivity. In some cultures, such as Japan, the expectation of immediate responses may reinforce social hierarchies and collective obligations, whereas in others, like the United States, connectivity is often associated with productivity and individual efficiency [67,68]. This cultural variability highlights the need for an anthropological analysis of digital practices to understand how constant contact is negotiated and interpreted across different contexts.

Constant contact profoundly alters the perception of time and space in social interactions (Figure 3). Communication mediated by digital devices introduces a simultaneity that collapses the boundaries between public and private life, work and leisure, and even the different social roles individuals perform [69,70]. This blurring of spheres can lead to a fragmentation of time and attention, hindering full engagement in face-to-face interactions and negatively affecting the depth of relationships [5].

The anthropological perspective also sheds light on the strategies individuals develop to cope with the demands of constant contact. Practices such as “intentional disconnection” are attempts to regain control over time and social space, while others, such as prioritizing face-to-face interactions, represent efforts to balance the benefits of digital connectivity with the need for intimacy and focused attention [71]. These practices highlight how individuals not only react to but also actively reconstruct their social realities in response to the demands of the digital world.

Anthropology, when examining the implications of ‘constant contact’, must recognize this phenomenon as a new and significant subject of study, essential for understanding transformations in contemporary social dynamics. This state of hyperconnectivity challenges traditional norms of interaction and sociability, creating new forms of belonging and exclusion that affect both social structures and individual experiences [72]. The consequences of continuous contact, such as connectivity fatigue and time fragmentation, raise fundamental questions about how digital technologies are reshaping human relationships, social hierarchies, and perceptions of intimacy. By analyzing these issues, anthropology can provide valuable insights into the social and cultural impacts of digital connectivity and propose pathways toward a more balanced coexistence between the digital world and face-to-face relationships.

‘Constant contact’ not only challenges the boundaries between public and private domains but also redefines how intimacy and belonging are experienced (Figure 3). For some, digital connectivity serves as a tool for inclusion, while for others, it becomes a source of alienation and loneliness [44]. A more in-depth anthropological approach can help to understand these dynamics and propose ways to balance the demands of digital connectivity with the pursuit of well-being and quality in human interactions.



Figure 3. The Consequences of ‘Constant Contact’: The pressure of uninterrupted digital availability leads to emotional exhaustion and anxiety, highlighting the challenges of modern connectivity. This image was created using DALL·E artificial intelligence.

5. The Need for Anthropological Research

The social transformations driven by the integration of digital technologies into daily life demand a reassessment of traditional anthropological approaches. The practice of ‘phubbing’ exemplifies how mobile devices are redefining social interaction norms, impacting the quality of interpersonal relationships and individual well-being [33,73]. Similarly, the constant connectivity enabled by smartphones creates a state of ‘constant contact’, which can lead to social overload and a decline in the quality of human interactions [63].

In this context, it is imperative for anthropology to develop new theoretical and methodological perspectives to understand these emerging dynamics (Figure 4). Ethnographic studies focusing on interactions mediated by digital devices can uncover the nuances of how different cultures and social contexts adapt to these changes, exploring the everyday practices associated with smartphone and social media use [52]. Such investigations are crucial for understanding the new forms of identity and community building in the digital age, as well as the impacts of these technologies on power relations, privacy, and intimacy [74,75].

Digital anthropology must take into account the ethical and political implications of emerging technologies, examining how they influence social structures and modes of subjectivity. A mixed-methods approach, combining qualitative and quantitative analyses, can enhance the understanding of the complex phenomena associated with digital technology use, enabling a more comprehensive analysis of contemporary social interactions [76].

To adequately investigate new digital environments and the emerging conditions of human relationships, anthropology must design and test innovative methodologies that adapt to ever-evolving technological and cultural dynamics (Figure 4). Traditional methods such as observation and interviews should be complemented by techniques that enable the analysis of online interactions, including digital ethnography, data mining on social platforms, and the use of artificial intelligence to map virtual sociability patterns. These approaches facilitate the exploration of the complexities of digital relationships, capturing nuances such as the performativity of online identities, the formation of virtual communities, and the tensions between connectivity and disconnection.

It is, therefore, essential for anthropologists to consider developing tools to study the long-term effects of these transformations on social structures and individual behaviors. Collaborative experiments with other disciplines, such as data science, psychology, and sociology, can enrich anthropological methods, enabling an interdisciplinary approach that reflects the intersection of culture, technology, and subjectivity. Participatory methods, where digital technology users themselves contribute to the design and execution of research, can also provide valuable insights into the motivations, anxieties, and expectations that shape digital practices.

These methodological innovations are crucial for expanding the horizons of anthropology in studying contemporary human relationships. Ultimately, the need for anthropological research addressing new social interaction issues, such as “phubbing” and constant connectivity, is urgent. By developing new theoretical and methodological perspectives, anthropology can significantly contribute to understanding the challenges and opportunities that digital technologies present for human relationships in the modern era.



Figure 4. The Need for Anthropological Research: The coexistence of traditional interactions and digital immersion highlights how mobile devices are transforming social norms and redefining human behavior. The image was generated using DALL·E artificial intelligence.

6. Conclusions

The impact of new technologies on human sociability should not be seen merely as an inevitable transformation but as a phenomenon that demands critical reflection and mitigation strategies. Regulating screen time, particularly in family and educational contexts, should be considered a priority to prevent adverse effects on social and cognitive development. Research on the impact of excessive smartphone use on human behavior needs to be expanded to support public policies that promote a more balanced digital coexistence. Raising awareness through campaigns on healthy technology use can help restore the importance of face-to-face interactions and preserve the richness of human connections amid the digital revolution.

The digital age presents significant challenges and opportunities for human relationships, demanding in-depth analyses of how smartphones and social media reshape social bonds, intimacy, and everyday values. Phenomena such as ‘phubbing’ and constant connectivity underscore the need for strategies that balance digital connectivity with meaningful face-to-face interactions. Anthropology, with its holistic focus and ethnographic perspective, provides valuable tools to understand the nuances of these transformations across diverse cultural contexts, uncovering tensions between physical and digital presence. By exploring these dynamics, the discipline contributes to the development of policies and practices that encourage a more conscious use of technologies, strengthening social bonds and enhancing the quality of human interactions in contemporary society.

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