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THE RISE OF TECHNO-AFFECTION: EXAMINING HUMAN EMOTIONAL ATTACHMENT TO DIGITAL DEVICES

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1. Introduction

Digital devices have become increasingly integrated into daily human life, leading to what we term “techno-affection” – the development of emotional bonds between humans and their digital devices. This phenomenon raises important questions about human-computer interaction and its psychological impacts. Through analysis of recent literature, we aim to identify key factors contributing to this trend and discuss implications for human-computer interaction, social psychology, and product design.

2. Key Findings

2.1 Anthropomorphism and Social Response

Users frequently anthropomorphize their devices, treating them as social entities. For example, studies of Roomba owners found that “21 had given it a name and 16 had categorized it as male.” [6]. This behavior persists even when users recognize its irrationality, suggesting a deeply ingrained cognitive bias [5].

Bartneck explains this tendency through an evolutionary lens: “People anthropomorphise almost any form of technology because the ability to recognise other life forms is deeply rooted in our evolutionary brains.” [10] This anthropomorphization manifests in multiple ways:

1. Social Etiquette: Users apply human social norms to devices, such as saying “excuse me” when bumping into robotic vacuum cleaners.

2. Emotional Responses: Users exhibit frustration, encouragement, and other emotional reactions typically reserved for social interactions, as demonstrated in Forlizzi’s study of Roomba users who would say things like, “Hey, come on over here. You’ve already done that.” [4]

3. Naming and Gendering: Beyond naming devices, users often arbitrarily assign them gender identities, reflecting a transfer of social schemas to inanimate objects. Some companies deliberately manage this tendency. Multiple companies currently tend to assign human characteristics not only to their robotic products, but to AI agents in order to enhance user interaction [1]. This tendency has become especially notable with advanced AI language models, where users might end developing emotional connections despite full awareness of interacting with artificial intelligence. It is consistent with the broader pattern of techno-affection observed with physical devices.

The researchers observed that users projected their own desires and emotions onto digital devices, treating them as "a pure, clean, simple mediation" [11]. This phenomenon presents both opportunities and challenges for designers, who must balance enhanced user engagement against the risk of fostering unrealistic expectations about device capabilities.

2.2 Responsiveness and Dependency

Digital devices, particularly smartphones, demonstrate a high degree of responsiveness and create persistent attention demands that foster emotional attachment. Vincent describes how these devices create "personal mobile worlds" – ethereal spaces where users maintain constant connection with their social networks. These devices have become "virtually a social necessity" [8, p. 33], serving not just as communication tools but as expressions of personal identity.

Recent research by Zhang et al. found that AI-chatbots can function as a "safe haven" for users, helping to modulate their emotional states [11]. This mirrors crucial aspects of human attachment relationships, particularly the parent-child bond. As Drouin observes, "responsiveness is one of the crucial elements of parenting... Hence through my responsiveness to my phone's demands, I have nurtured it as well" [3].

This relationship is reinforced through multiple design mechanisms:

1. Multisensory Engagement: Devices employ visual, auditory, and haptic notifications, creating pavlovian responses that prompt regular checking behavior.

2. Need Fulfillment: Modern devices address multiple levels of Maslow's hierarchy:

- Safety needs through emergency functions and health monitoring;
- Love and belonging via social connectivity;
- Esteem needs through social validation;
- Self-actualization through educational and creative tools.

3. Constant Availability: As Turkle notes in "Reclaiming Conversation," this perpetual connectivity can generate anxiety when users are separated from their devices, further reinforcing attachment patterns [7].

However, this responsive design presents paradoxical effects. While fostering device attachment, it can impair human relationships through what Roberts terms “phubbing” (phone snubbing), where constant device checking implicitly communicates that the device takes priority over present company [2].

The dependency pattern is particularly evident in users’ unwillingness to be separated from their devices, as well as to always keep them fully charged. Vincent mentions the “development of the apparently symbiotic and emotional relationship between device and user” [9, p. 71].

2.3 Emotional Engagement Over Reliability

Apparently, emotional engagement with devices (and more recently – with AI services) frequently supersedes concerns about their technical reliability or functional limitations. This finding challenges traditional assumptions about consumer behavior and product satisfaction in human-computer interaction. According to Beki Grinter, associate professor at Georgia Tech’s College of Computing, “They’re more willing to work with a robot that does have issues because they really, really like it [...] If we can design things that are somewhat emotionally engaging, it doesn’t have to be as reliable” [6]. Drouin observations support this, noting, “Certainly, there are costs: it is my biggest distraction from my work, family and friends... I still recognize myself as prey, and that leaves me discontented.” [3] Yet, such awareness does not diminish the emotional attachment.

This buffer against technical frustration is manifested in concrete behavioral adaptations, with users making physical alterations to their living spaces to accommodate the robot’s limitations. When the users interact with the AI services, they often do it not out of necessity, but rather because of the feelings of isolation that may drive individuals toward AI companionship [1].

3. Implications

This phenomenon has significant implications for:

- Product Design: Designers may intentionally incorporate features fostering emotional attachment;
- Human-Computer Interaction: Traditional models focusing solely on functionality may need revision to incorporate emotional dimensions;
- Mental Health: Devices and AI services contribute to new forms of “electronic emotion” affecting psychological well-being, while emotion-laden interaction with AI may affect personal identity and emotional dependency patterns;
- Social Dynamics: Device attachment is reshaping communication patterns and societal norms.

4. Conclusion

Techno-affection emerges as a complex phenomenon rooted in human psychology and intentional design strategies. As AI technology advances, these

emotional connections are likely to intensify and evolve, especially with AI models that can engage in sophisticated social interactions. While these emotional connections can provide benefits, they also raise concerns about impacts on human-to-human relationships and psychological well-being, as users may develop attachments not just to physical devices but to the intelligent software systems that inhabit them.

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