

From Surveys to TV Series: Study of the Role of Haptic in Social Interaction

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Abstract: Here we discuss the role of haptic technology in social interaction. We report the first steps of a project where we want to study the use of a non-visual tactile-auditory device to connect physically distant individuals engaged in non-intimate activities. First, we report the result of a survey to investigate the significance of touch in social interactions. Second, we detail the analysis of touch in some tv shows.

1 INTRODUCTION

In the wake of the pandemic, the surge in remote interactions particularly in professional relationships, has become a prevailing norm. However, the challenges of remote work, including potential isolation and less effective communication, highlight the need for innovative solutions. The limitations of distance communication, often exacerbated by the absence of non-verbal cues, which play an important role in conveying true intentions (Ruth and Warne, 2022), raise questions about the role of touch in bridging this gap.

As we navigate the evolving landscape of remote professional relationships, we question whether the incorporation of touch could play a more significant role. Particularly during virtual meetings on platforms like Zoom, the prospect of introducing haptic feedback, whether tactile or thermal, on the forearm or shoulder seems desirable. To explore the viability of this concept, we undertook two comprehensive studies. One involved an in-depth analysis of tactile interactions in popular TV shows, unveiling that shoulders and the outside of the arm are commonly touched during non-intimate communication. The second study comprised a survey, seeking insights from individuals, further contributing to our understanding of the acceptability and desirability of touch in remote professional interactions.

This article delves into the intersection of haptic

technology and social interaction, addressing the challenges posed by remote work and emphasizing the potential of touch to enhance virtual professional engagements. Against the backdrop of the fundamental role of social interaction in sociology and psychology, we explore how haptic technology can contribute to the evolving dynamics of communication, empathy, and engagement in the remote professional landscape.

Several studies have shown that the role of touch remains ambiguous in social relationships, varying across cultures and individuals. It is known that touch can be used to express joy, affection, love, support, empathy, understanding, reassurance, tenderness, etc. In the iFeel_IM! study, a sophisticated touch sensing system is introduced for remote communication (Tsetserukou and Neviarouskaya, 2010). This system employs six haptic devices alongside visual stimulation, aiming to enhance emotional experiences during online conversations. Elements such as physiological changes (heart rate and body temperature), physical stimulation (tickling), social touch (hugging), and emotional haptic design contribute to conveying a spectrum of emotions, with a notable prevalence of positive emotions like joy. The system successfully elicits emotions, emphasizing the potential of haptic technology to amplify emotional experiences through touch.

In the realm of haptic technology, studies like HugMe (Cha, Eid, Rahal and El saddik, 2008) underscore the significance of touch in conveying

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emotions. Designed for lovers and remote children caring, HugMe functions as a haptic audio-visual tele-conferencing system. It simulates the comforting sensation of a hug, effectively conveying positive emotions associated with human touch and connection. The development of such systems emphasizes the role of touch in fostering emotional connections, contributing to the exploration of haptic technology's potential in enhancing social interactions.

Continuing the exploration of haptic communication technologies, The POKE (Park and Tek-Jin, 2013) device introduces an innovative approach to express emotions through touch during phone calls. Featuring an inflatable surface on the device's front, POKE enables callers to share tactile interactions, including pokes and poke backs. This approach opens avenues for developing affective tactile languages, providing a non-verbal means to convey a range of emotions such as comfort, affection, or support during phone calls.

Embarking on a nuanced exploration of haptic communication, this study delves into the realm of air jet-based tactile stimulation to unravel emotional dimensions (Tsalamlal, Ouarti and Martin, 2015). The experimental research, involving sixteen participants, revealed that the intensity and movement velocity of the air jet stimulation significantly influenced the evaluations of valence, arousal, and dominance. In the context of interpersonal communication, existing studies emphasize the role of nonverbal channels, with touch being a prominent means of expressing and recognizing emotions. Touch, as part of nonverbal communication, serves as a tool for conveying aspects such as status, power, or dominance. Specifically, dominance can be effectively communicated through tactile interactions on areas such as the arm, face, shoulder, or waist (Norah and Dunbar, 2015).

2 OBJECTIVES

Our research aims to investigate the use of a nonvisual, tactilo-auditive device to connect physically distant individuals engaged in non-intimate activities. Given that humans are social creatures but also have a need for privacy, the use of non-visual feedback can provide a significant advantage in many everyday situations that may not be achievable with visual means. Previous research has shown that touch and sound can play an important role in establishing a trusting relationship between individuals (Menelas, Picinali, Bourdot and Katz,

2014) (Schenker, Castro and Casado-Kehoe, 2017). Therefore, to come up with a device that can grasp the full possibilities of such a communication, our research project will involve a comprehensive study to explore the importance of touch in social interaction and determine the contexts in which touch is allowed and considered appropriate. Subsequently, we will design and develop a smart tactile-sound sleeve, equipped with sensors, actuators, and microcontrollers, that will be used to enhance communication between distant individuals. This innovative device will enable individuals to connect through haptic and auditory channels, allowing them to share information about their immediate environment and interact with each other in a non-visual manner.

3 METHODOLOGY

This research constitutes the first step of this project, here we want to characterize touches that occur during conversations of non-intimate persons. Two studies are carried out in order to confirm that shoulders and the outside of the arm are the parts of the body that are likely to be touched during communication between non-intimate individuals. To do so, in one study we analysed how tactile interactions are exploited in some TV shows; in another study we conducted a survey to collect ideas of people.

3.1 A Survey to Investigate the Significance of Touch in Social Interactions

In this study on the significance of touch in social interactions, we collected responses from 143 participants of diverse genders and nationalities. The survey included several questions regarding the importance of touch, specifically on the shoulders and arms, during conversations, particularly in friendly, professional, and familial contexts. The questionnaire was conducted online using the LimeSurvey platform of our university. By utilizing this platform, we created various question blocks to thoroughly explore the participants' attitudes and perceptions concerning the significance of touch in their social interactions, including interactions that take place at a distance. These data will be analyzed to understand the role of touch in human communication and examine how it can be utilized to enhance social interactions, even in remote scenarios.

3.1.1 Questionnaire

The survey consisted of fifteen questions, with some containing sub-questions. Q1 inquired about gender to understand the significance and representation of touch among various genders. Q2 asked respondents about their nationality to ensure diversity in responses from different countries. Q4 inquired whether it is acceptable to touch the arm or shoulder of an interlocutor during non-romantic conversations (e.g., friendly, professional, etc.) We sought to discern specific patterns of touch within these distinct scenarios, delving deeper into the nuances of interpersonal interactions. By analyzing responses, we aim to uncover subtleties in participants' perceptions and attitudes towards touch, exploring how cultural and contextual factors influence the acceptability of physical contact in both friendly and professional conversations. For those who responded "no," a sub-question (Q7 and) explored the reasons behind their response, while for those who answered "yes," (Q5) asked them to specify the contexts in which they find it acceptable (e.g., friendly, professional, familial, Other) with multiple choices provided.

Q8 aimed to determine if it is possible to convey emotions to an interlocutor through touch during a conversation. For those who answered "yes," Q9 provided multiple choices for the emotions that can be transmitted through touch and an option to add any other emotion if not listed. Additionally, Q10 asked those who responded positively to describe a situation in which they had either received or given a significant touch on the arm or shoulder to someone.

Furthermore, in Q13, we sought to determine respondents' interest in a device that could introduce touch during remote conversations. As part of our ongoing research, we plan to propose such a device to enhance the sense of touch in distance interactions. We asked if they believe such a device would be valuable. For those who responded positively, we offered the option to express their willingness to be contacted for participation in the next phase of our research.

The survey results cover responses gathered between February 2, 2022, and July 20, 2023. It is important to note that this study received ethical approval from our university's ethics committee.

A total of 143 respondents participated in our survey, with 65.73% being female. The majority of respondents were from Canada, and there were also participants from other European, African, and American countries.

3.1.2 Results and Discussion

As we delve into the survey results, it is crucial to address the significance of specific questions. For Q4, among the 143 participants, 107 individuals (74.83% of the responses) accepted being touched on the arm or shoulder during non-romantic conversations, as shown in Fig. 1. Conversely, 36 participants indicated that they did not find touch desirable due to reasons such as discomfort, unnecessary intrusion, or feeling awkward.

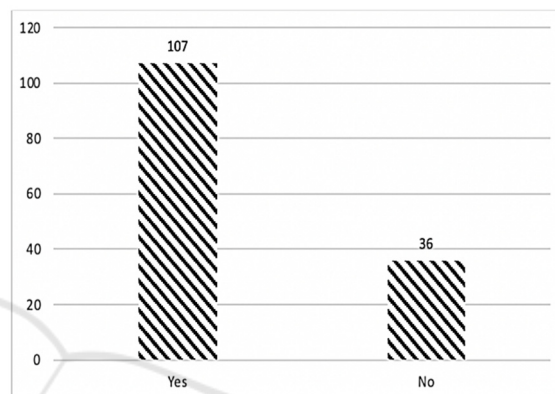


Figure 1: Acceptability of touch in non-intimate activities.

We also inquired whether participants believed it was possible to convey emotions to their conversation partner through touch. Out of the 143 respondents, 128 individuals (89.51%) answered affirmatively (Fig. 2), recognizing the crucial role of touch in conversations and its ability to transmit various emotions and sentiments (Fig. 3), including trust, joy, security, comfort, sadness, sympathy, empathy, and more.

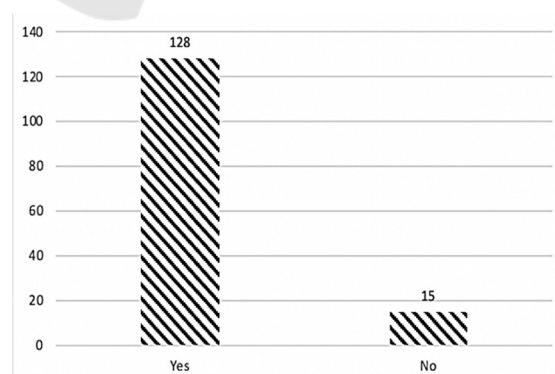


Figure 2: Is it possible to convey emotions through touch during a conversation?

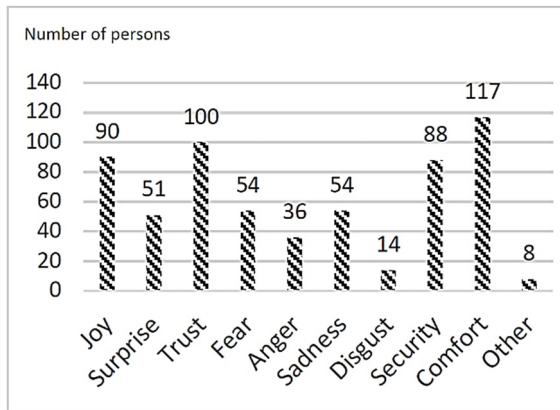


Figure 3: Emotions that can be conveyed through touch.

Subsequently, we addressed the topic of incorporating touch into remote communication, which has evolved from traditional phone calls to video calls. Among the 143 participants, 73 individuals expressed that the addition of touch in remote communication would be beneficial, particularly in consoling someone, providing reassurance, supporting others, communicating with isolated or ill individuals, engaging in romantic conversations, or fostering a sense of presence. On the other hand, 70 participants had concerns, citing the challenges of conveying real touch and associated emotions at a distance.

Lastly, we asked participants for their opinion on the potential value of a device that enables touch during remote conversations. As we can see in (Fig. 4) Out of the 143 participants, 102 individuals responded positively and expressed interest in such a device, while 41 participants believed that such a device would not be beneficial.

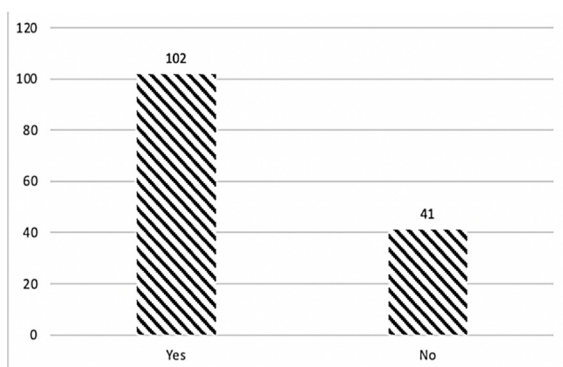


Figure 4: Interest in a Device for Facilitating Touch in Distant Conversations.

The survey results underscore the significance of touch in various conversations and its ability to

convey emotions, even in non-romantic interactions. After analyzing the responses, we found that individuals are generally accepting of being touched on specific parts of the body, such as the shoulder, arm, or hand, during non-intimate conversations, as long as the touch occurs within a friendly, professional, or familial context. Respondents also acknowledge that emotions and sentiments can be effectively conveyed through touch, and some even provided personal situations where touching played a significant role, such as congratulating a colleague with a touch on the shoulder or grabbing someone's attention, offering consolation and encouragement during sad moments.

Furthermore, the survey indicated a noteworthy interest among participants in a device that facilitates touch during remote communications. This finding serves as a promising stepping stone for the development and enhancement of our proposed device. With this valuable insight, we are motivated to explore further possibilities and opportunities to create a device that fosters meaningful connections and enhances communication in distant interactions.

3.2 Analysis of Some TV Shows: How Touch Is Exploited in Our Society

In this research, we conducted an analysis of various international TV shows to explore the portrayal of touch in social interactions. Deliberately selecting scenes from popular series in their respective countries, which offer a more comprehensive reflection of touch in society and closely mirror our daily interactions, we focused on distinct acceptable areas of touch, including shoulders, arms, forearms, and hands, within conversational contexts. The primary objective was to scrutinize both the context of these tactile interactions and the emotions they convey.

In the Brazilian series "3%", Episode 1, at 3 minutes and 9 seconds, a touch on the arm portrayed the deep bond of love between two sisters. As one of them was saying goodbye and preparing to move to another place, the tender touch conveyed the emotions of affection and care, showcasing the strong connection between them even in the face of separation.

Similarly, at 22 minutes and 58 seconds, a touch on the arm conveyed deep sympathy in the relationship between a worker and a candidate. This touching moment occurred between background actors, and it was significant as it took place right after the candidate was eliminated from the competition. The subtle yet powerful touch

demonstrated the worker's compassion and support for the candidate during a difficult and emotional moment. Non-verbal cues like this touch can speak volumes about the underlying emotions and connections between individuals, even in the context of background interactions.

In the American series "You," Episode 1, at 41 minutes and 7 seconds, a touch on the shoulder provided comfort and sympathy as a neighbor consoled a sad child. This touching moment occurred after the child had experienced stress and sadness due to the loss of a book given by the neighbor to read. The child's distress was caused by his mom's boyfriend, who made the book go missing. The gentle touch on the child's shoulder conveyed understanding and support, helping him feel comfortable and reassured during a difficult time. It illustrates how a compassionate touch can serve as a powerful means of expressing empathy and offering solace in emotionally challenging situations.

In the Moroccan series "Rdat lwalida," Episode 2, at 4 minutes and 30 seconds, a touch on the shoulder and forearm expressed sympathy between a mother and her son. This familial touch symbolized the profound love and support of a mother towards her son during difficult moments.

In the Japanese series "My Boss My Hero," Episode 3, at 8 minutes and 56 seconds, a touch on the arm expressed gratitude in the relationship between a leader and a valet. The simple yet meaningful touch conveyed genuine appreciation and acknowledgment from the leader to the valet, leaving the valet feeling happy and fulfilled with his actions. This impactful display of gratitude symbolizes the significance of such gestures in strengthening professional bonds and fostering a positive work environment.

In the British-American series "Outlander," Episode 1, at 3 minutes and 3 seconds, a touch on the arm conveyed happiness in a friendship within the army. This scene occurred after people received the joyful news that the war was over, prompting them to express their emotions beyond words. The significant takeaway from this scene is the powerful sharing of happiness, one of the most positive emotions for humans.

Similarly, at 19 minutes and 45 seconds, a touch on the shoulder evoked feelings of satisfaction as friends were rendering a service. This regular context showcased how expressions like "thank you" can be conveyed through various forms, with touch sometimes carrying even more profound significance.

In the French series "Lupin," Episode 1, at 31 minutes and 10 seconds, a touch on the shoulder and

back expressed sympathy between a little child who lost his father and a lady. This touching moment highlights the power of physical contact, especially during difficult moments like grief.

At 33 minutes and 35 seconds, a touch on the arm conveyed familiarity and a sense of comfort in a context where a man needed to feel at ease with the police. This illustrates how professionals often utilize physical touch to provide a sense of security.

The American series "SEE" is about a visually impaired society where people rely heavily on touch to understand their surroundings and replace the use of sight. In the first episode, at 3 minutes and 8 seconds, a touch on the hand and stroking of the forearm conveyed a profound sense of care and compassion between two ladies. The context was that of supporting a lady who was giving birth and going through a challenging experience.

For instance, in the same EP at 29 minutes and 46 seconds, a lady reads a negative braille message (a message read through touch) and immediately senses something ominous. The touch-based reading evokes feelings of sadness and fear, demonstrating that blind individuals can interpret emotional content through tactile communication.

Based on the analysis of these series from different countries, it is evident that Japanese series depict fewer touching moments during non-romantic conversations, taking into account the cultural norms of the country. Conversely, French, Brazilian, and Moroccan series feature a greater number of touch moments, particularly in friendly, professional, and familial contexts. The depiction of touch in these series provides valuable insights into how different cultures perceive and incorporate touch in their social interactions, showcasing its role as a significant non-verbal communication tool.

4 CONCLUSIONS

With the survey, it appears clearly that people would feel comfortable with friendly, professional, or familial touch in their arm, shoulder etc. Furthermore, come express an interest for a device may convey touch during remote communications.

The analysis of various series highlights touch's powerful role in conveying emotions and fostering meaningful connections. Touch serves as a universal language of emotions, enriching social interactions across contexts. These findings inspire further research and technology development to facilitate touch in distant conversations.

This finding serves as a promising stepping stone for the development and enhancement of our proposed device. With this valuable insight, we are motivated to explore further possibilities and opportunities to create a device that fosters meaningful connections and enhances communication in distant interactions.

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