

Understanding Desire to Touch Using Large-scale Twitter Data

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Abstract

I and research colleagues investigated people's desire to touch by collecting and analyzing a large amount of text data that contain phrases such as "want to touch" on Twitter. We revealed the relationship between the body part that people want to touch and the touch gesture. We also revealed the effects of the COVID-19 pandemic on the desire to touch. Specifically, we observed "skin hunger," i.e., the strong desire for physical communication, and variation of touch avoidance toward objects such as doorknobs. Our results will be beneficial for understanding human behavior as well as for the further development of haptic technology.

Keywords: desire to touch, Twitter, haptics

1. Background

People physically touch many targets throughout the day. For instance, people may make physical contact with familiar people or animals to communicate with them, touch targets to evaluate their texture, or use equipment such as pliers to determine their condition. There are targets that people desire to touch and others that they do not. From the perspective of understanding human behavior, it is crucial to comprehend what people want to touch. Recognizing the desire to touch is also beneficial for the development of consumer applications that satisfy such desire using haptic displays.

The COVID-19 pandemic required a sudden cessation of physical contact, and the extended lockdown had left many people in isolation. This unprecedented dissociation from touch has affected people's mental and physical well-being. Some people may experience "skin hunger," i.e., the strong desire for physical communication, and a public health crisis has been addressed in the major mass-media outlets [1] as a result of a life without touch. For the scientific study of human behavior as well as the development of technology that enables social touch at a distance, it is crucial to comprehend how people's desire for touch changed as a result of the COVID-19 pandemic [2].

Previous research [3] examined the desire to touch through laboratory experiments in which participants saw or touched specific objects that are rarely touched in the course of a day then responded to questions on the degree to which they felt a desire to touch. Therefore, the desire to touch was not addressed. The methods for investigating the desire of people to touch targets placed in front of them do not enable investigation of the desire to touch that people may have felt in the past.

We chose Twitter for our analysis to aggregate the self-reporting of what people desire to touch. Twitter accumulates a large amount of users' spontaneous reports (tweets) about their intention at various times throughout the day. By analyzing tweet texts, we aimed to understand people's desire to touch and how it changed due to the COVID-19 pandemic.

2. Desire to touch in daily lives

We analyzed the text data posted on Twitter containing each of the seven phrases such as "want to touch" (as shown in leftmost column in **Table 1**). The phrases were defined by referring to exploratory procedures [4]. Each phrase corresponded to different touch gestures. We then conducted preprocessing, such as noise reduction, on the text data and syntax

Table 1. The relationship between popular targets of touch desire and touch gesture.

Phrases corresponding to touch gesture	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
want to touch	breast	hair	buttocks	cat	abdomen	cheek	dog	body	ear	hand
want to statically contact	you	people	skin	cat	hand	warmth	animal	human skin	object	lip
want to stroke	head	cat	dog	abdomen	buttocks	hair	me	back	child	cheek
want to grab	waist	hand	buttocks	tail	arm	hair	ankle	breast	tongue	leg
want to push	button	stamp	cart	abdomen	card	whorl	key	everyone	mole	chair
want to hit/tap	drum	buttocks	keyboard	head	hand	shoulder	something	iron	them	cheek
want to trace	line	abdominal muscle	eyebrow	muscle	back	clavicle	blood vessel	crack	tooth	ditch

analysis using a machine-learning model to extract the targets that people expressed a desire to touch.

We determined the popular targets for each touch gesture, as shown in Table 1, showing the relationship between targets of touch desire and touch gesture.

We found that body parts were more popular than objects. We visualized the geometric relationships between touch gesture and body part by mapping them into a whole-body illustration (see Fig. 1). In this illustration, each touch gesture (e.g., “grab”) is mapped to body parts where occurrence probability of the touch gesture (e.g., corresponding to “want to grab” in the first row of Table 1) is higher than that in the gesture of general “touch” (corresponding to “want to touch” in the table). We also mapped the gesture of general “touch” when occurrence probability of the body part was higher than that for other touch gestures.

In accordance with this visualization, for example, we see that the head is the desired target of stroking. This might be due to multiple factors such as people feeling pleasure by stroking hair. It might be also due to communicative and cultural aspects because in Japan, people stroke the child’s head as an expression of affection.

3. The impact of the COVID-19 pandemic on desire to touch

Similar to the analysis in the previous section, we analyzed the data from before the outbreak of the COVID-19 pandemic to quantitatively investigate the change in the desire to touch before and after the pandemic began. The difference-in-differences method was used to analyze how the desire to touch people/animals changed after the outbreak of the pan-

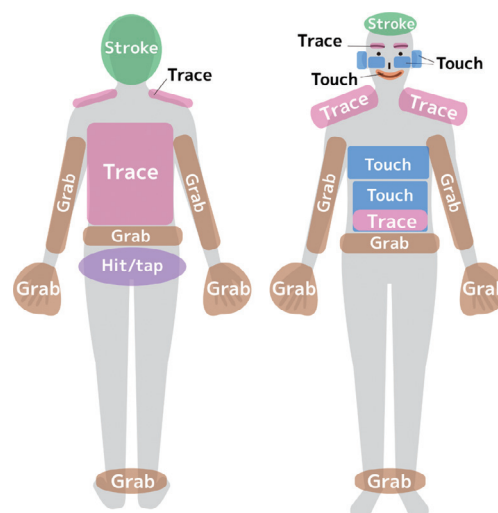


Fig. 1. The relationship between desired body parts and touch gesture.

demic. **Figure 2** shows the amount of text data that contains the phrase “want to touch people/animals.” Concerning the desire to touch people/animals, we can see that it was at a normal level immediately after the outbreak of the pandemic but became stronger when the first state of emergency was declared in Japan and has continued to become stronger. This indicates that skin-hunger may have become chronic. This change in desire to touch may have occurred due to the effect of requests to social distance and stay at home after the outbreak of the pandemic.

The same analysis was conducted on the avoidance to touch objects such as doorknobs. **Figure 3** shows the amount of text data that contains the phrase “don’t want to touch objects (e.g., doorknobs).” The avoidance

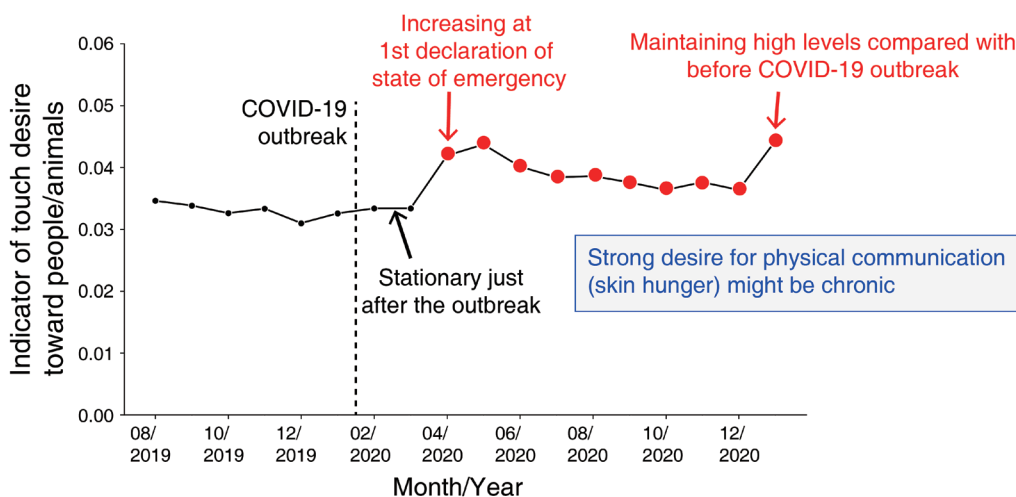


Fig. 2. Change in desire to touch people and animals.

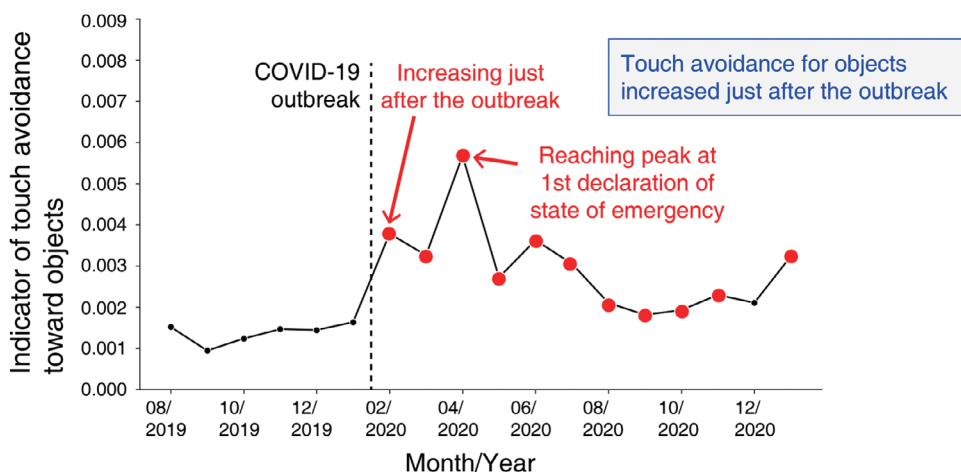


Fig. 3. Change in touch avoidance toward objects (e.g., doorknobs).

to touch objects has become stronger since the outbreak of the pandemic.

When the graphs in Figs. 2 and 3 are compared, we can see that the change over time in the desire to touch people/animals and avoidance to touch objects. The desire to touch people/animals did not change immediately after the outbreak but began to change around the time a state of emergency was first declared in Japan. The avoidance to touch objects changed immediately after the outbreak and temporarily increased when a state of emergency was first declared. This difference in the characteristics of temporal change might be related to the human ten-

dency to prioritize risk avoidance.

4. Conclusion

This study clarified people’s desire to touch and how it changed due to the COVID-19 pandemic. The findings can be applied to a wide range of problems and contribute to elucidating the psychological mechanism of when humans want to touch something and the development of haptic technology for providing the experience of touching something consumers would naturally want to touch.

References

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