

Stroke, Tickle, or Squeeze: Do the Different Affectionate Touch Actions Have Their Own Social and Bodily Topographies?

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Introduction

- Research suggests that affectionate touch is supported by a specialized neurological system named the C-tactile (CT) system. CT afferents were found only on hairy skin but not on glabrous sites.
- While affectionate touch may involve various actions, the existing literature has treated them interchangeably and focused primarily on only one action, pleasant stroking.
- Such practice was implemented because stroking stimulated the CT system the most. Other actions are although often performed to express affection and are associated with tactile pleasure, they were seldom considered in existing research on affectionate touching.
- Existing work leaves open whether the different affectionate touch actions are interchangeable or instead are functionally distinct with specialized roles in human interactions.
- This study aimed at investigating whether and how various affectionate touch actions differ in terms of their social and bodily topography
- We asked whether affectionate touch may be more differentiated and explored such differentiation by examining the bodily and social patterns of different touch actions as a function of the toucher's sex.

Questions

- (1) Do typical touch topographies of stroking and other affectionate touch actions match with the distribution of CT afferents?
- (2) Do the other affectionate touch actions present touch patterns that are different from stroking?
- (3) Are there sex differences in the touch pattern of various actions?

Method

Eighty participants (40 women) were recruited to complete an online questionnaire on their last week's tactile experience with eight different common affectionate touch actions (leaning, petting, squeezing, stroking, embracing, holding, tickling and kissing).

For each touch action, participants answered questions about the type of individuals they felt comfortable touching and filled in a body outline indicating where they would direct their touch.

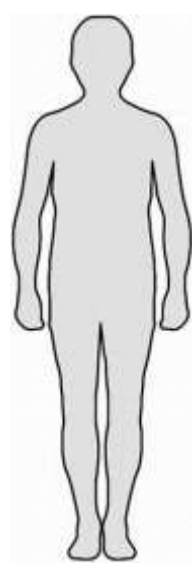


Fig.1 on the left illustrates a sample of body map that participants color on to indicate where they touch another person. The back and front touch topographies were collected for each action.

Results

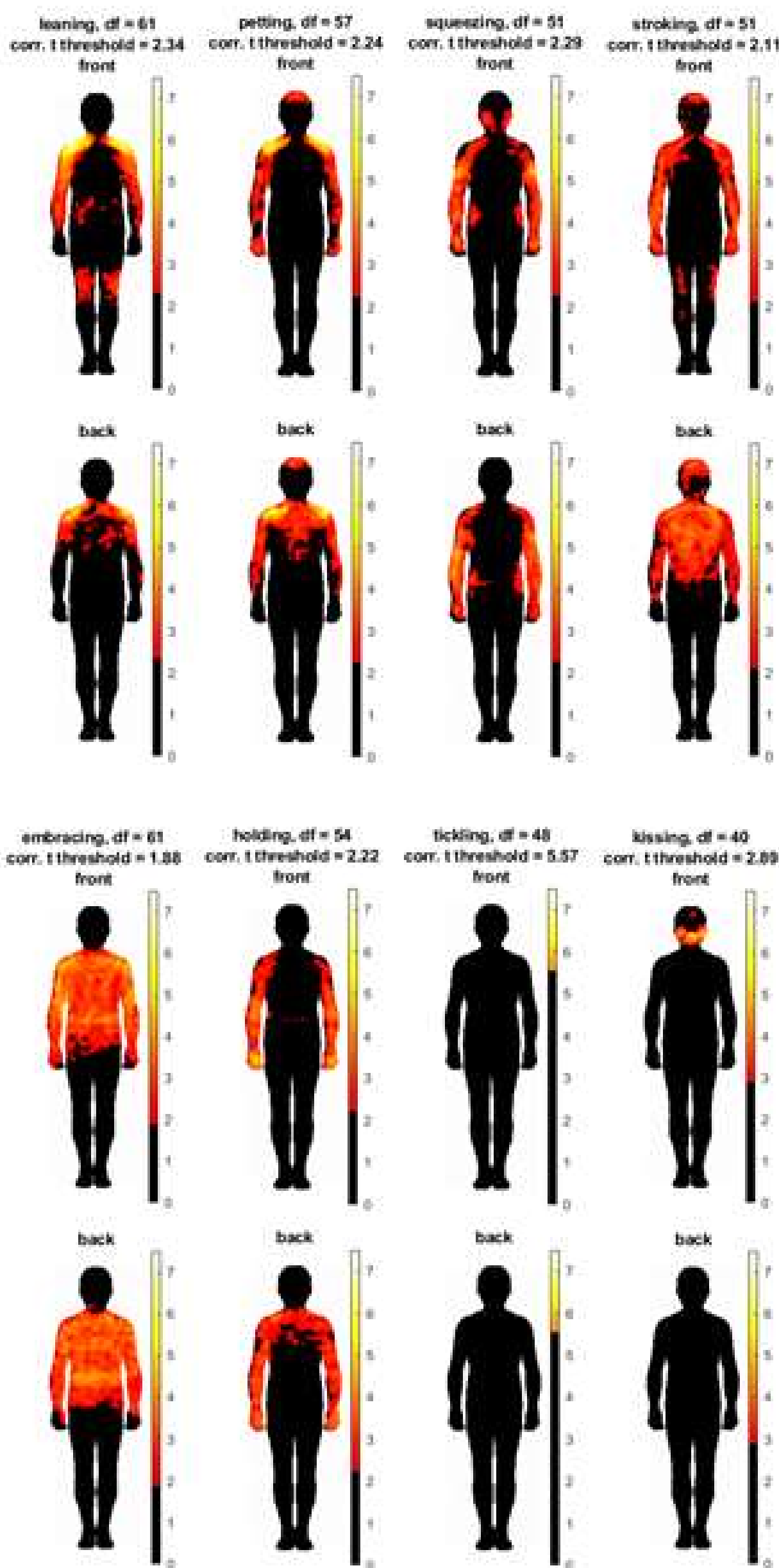


Fig. 2. T-maps of the 8 types of touch actions ($P < 0.05$, FDR corrected)

T-maps were computed for each action with mass univariate t-tests. Independent t-tests between the color-maps of male and female participants yielded non-significant differences

Results (cont.)

| | | Predicted categories | | | | | | | | colour bar (%) |
|-------------------------|-----------|----------------------|---------|---------|---------|---------|-----------|----------|----------|----------------|
| | | embracing | holding | kissing | leaning | petting | squeezing | stroking | tickling | |
| Observed categories (%) | embracing | 80.7 | 3.23 | 1.61 | 4.84 | 0 | 1.61 | 6.45 | 1.61 | 100 |
| | holding | 3.64 | 80 | 0 | 9.09 | 3.64 | 0 | 3.64 | 0 | 90 |
| | kissing | 0 | 2.44 | 95.1 | 0 | 0 | 2.44 | 0 | 0 | 75 |
| | leaning | 1.61 | 3.23 | 0 | 87.1 | 4.84 | 0 | 0 | 3.23 | 60 |
| | petting | 0 | 6.9 | 0 | 5.17 | 82.8 | 3.45 | 1.72 | 0 | 45 |
| | squeezing | 0 | 5.77 | 1.92 | 1.92 | 1.92 | 84.6 | 1.92 | 1.92 | 30 |
| | stroking | 1.92 | 7.69 | 3.85 | 1.92 | 7.69 | 0 | 75 | 1.92 | 15 |
| | tickling | 0 | 10.2 | 2.04 | 8.16 | 2.04 | 0 | 2.04 | 75.5 | 0 |

Fitted model: $n = 431$ cases used in estimation; 431 observed/ predicted pairs with 82.4 % accuracy

Fig. 3. Prediction-accuracy table of the linear discriminant analysis. The diagonal indicates the percentage of cases that were accurately categorized into their corresponding actions.

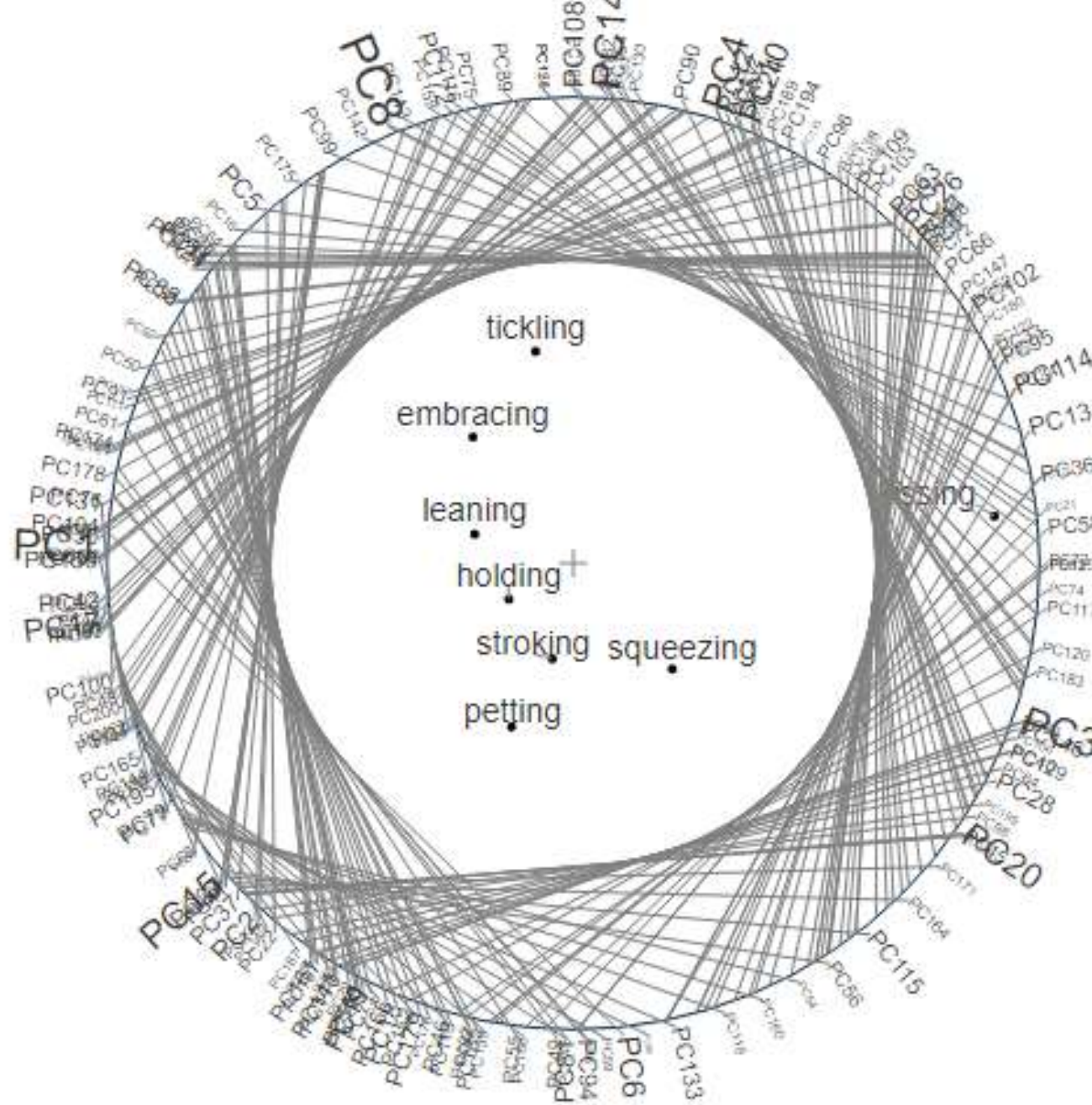


Fig. 4. Moon Plot of the LDA results. The closer the action labels are, the more similar they are in terms of topography.

The maps entered a linear discriminant analysis (LDA) and their respective actions could be identified with an 82.4% accuracy rate against 12.5% chance level. The results indicated that kissing was the most distinctive topography while stroking displayed more spatial similarities with petting.

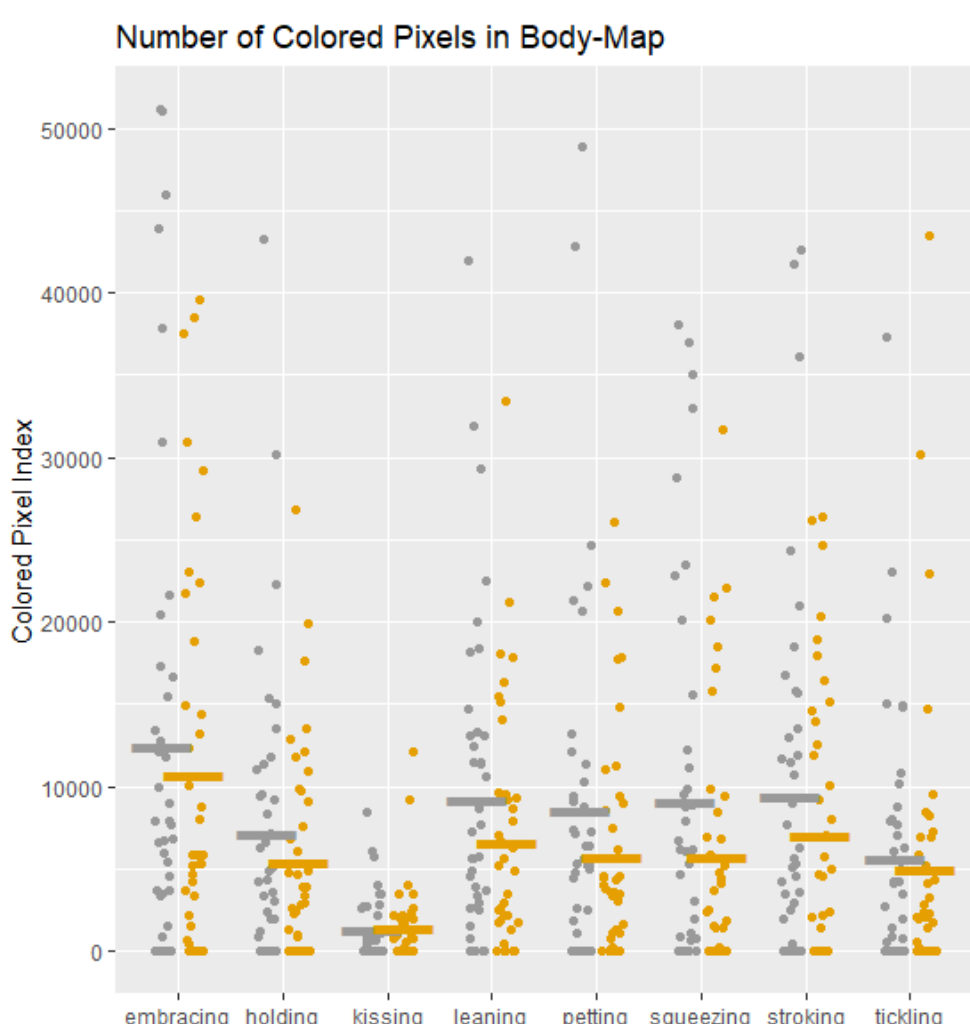


Fig. 5. Total number of colored pixels in body maps of each action by sex of the participants

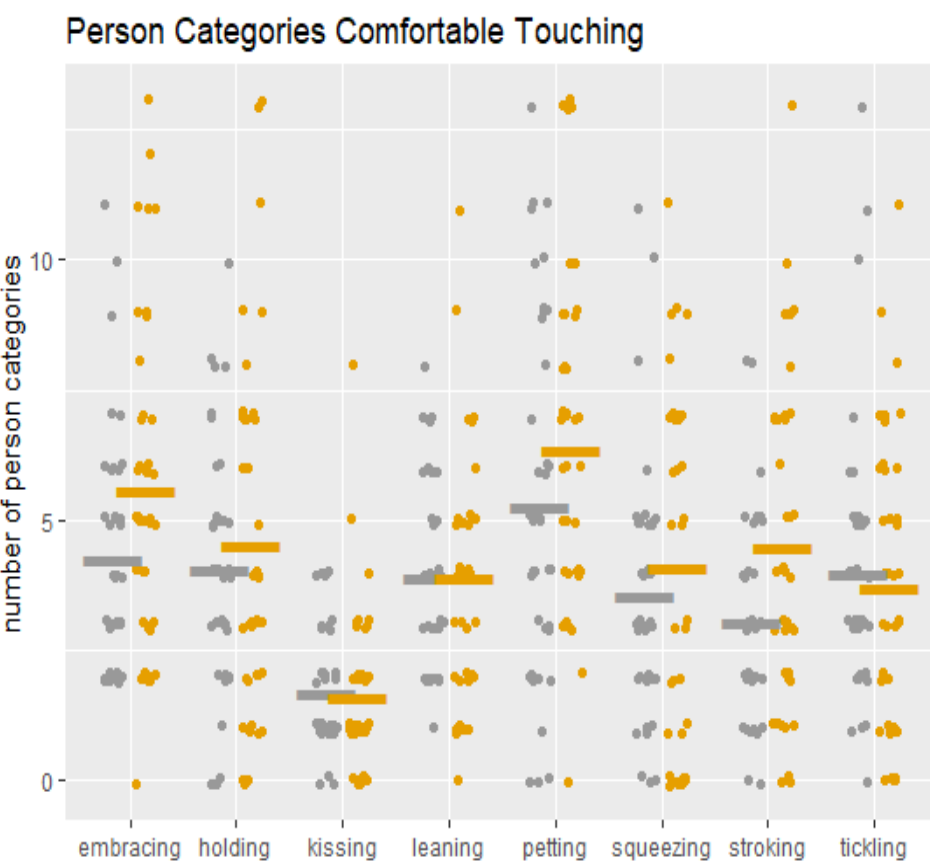


Fig. 6. Total number of social categories selected as comfortable touching with each action by sex of the participants

The total touch area was calculated by summing the number of colored pixels on the map. The summed score was then subjected to a two-way mixed ANOVA with action as a repeated measures factor and sex as a between-subject factor. The number of social categories of comfortable touching was used as an evaluation of social pattern. It was examined using a similar two-way mixed ANOVA.

Both tests yielded significant main effects of actions ($p < .001$) while there was no significant differences between sex.

Discussion

- Topography of typical stroking mapped onto hairy areas rich of CT afferents.
- Petting had relatively similar topography with stroking which may provide support for its higher association with the CT system.
- The results here offer first evidence that different touch actions have their unique bodily patterns. They were also different in terms of total touch area and number of social categories selected as comfortable touching. Kissing, for example, was the most distinctive and intimate type of action that mapped on glabrous skin without CT. This may provide evidence that some affectionate touch features do not rely on information relayed by the CT afferents.
- Sex differences were non-significant. .
- Taken together, the findings also highlight that different affectionate touch actions may serve different roles in social interactions in that they target different groups of individuals and different body areas. Thus, affectionate touch is not a unitary phenomenon but fairly differentiated, it may be better understood by pursuing multiple instead of only one touch action.

Answers

- (1) Topography of stroking mapped onto anatomical distribution of CT afferents suggested by previous studies. Topography from most of other actions also displayed some overlapping with such distribution.
- (2) Yes, each action displayed some distinctiveness with social and physical pattern of stroking. Kissing was the most distinctive action among all.
- (3) Sex differences were non-significant across all tests.