



A Study on the Association between Physical Warmth and Social Warmth in High School Students of Taiwan

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Abstract

Some evidence supported the hypothesis that the perception of physical warmth is associated with social warmth. In this study, we tested this hypothesis in the Chinese teenager population in Taiwan to evaluate whether cultural and age factors may influence this association. Participants were given to hold a cold drink (n=10) or a hot drink (n=12), and they then provided friendliness score on the scale of one (less friendliness) to five (more friendliness). It was found that the scores from participants holding a hot drink and from participants holding a cold drink were 3.42 and 2.5, respectively (p=0.072). The frequency of participants holding a hot drink who gave higher scores (equal to and greater than 3) was 83%, whereas 50% of participants holding a cold drink gave higher score (p=0.102). The results indicated that individuals holding a hot object tended to show more friendliness than individuals holding a cold object, albeit without statistical significance. Larger sample size may be needed to have clear conclusion on the connection between physical warmth and social warmth, and it is also likely that this connection may be influenced by other factors, such as culture, age with different social experience, and environmental warmth.

Introduction

"Warm" and "cold" have been regarded as essential personality traits, and they appear to play a crucial role in generating the initial impression of an individual's personality [1]. The psychological warmth and coldness are also considered to be related to interpersonal perception and social connection, and warmth is considered as one dimension of social cognition [2]. Thus, the warm and cold personalities are believed to be the important predictors of personal social behaviors [3]. The warm personality attribute usually is associated with personal friendliness, affection and enthusiasm, and it may convert into social warmth to promote face-to-face trustworthiness and interpersonal interaction. The feeling of belonging and connection with others is known as social warmth.

Accumulating data suggest that the perception of physical warmth is connected to social warmth, the feelings of social connection and interpersonal warmth. It has been shown that the exposure to hot objects was associated with a warmer disposition and selecting a present for a friend [4]. Higher oral temperature and tympanic temperature has also been shown to be linked to the greater feeling of social connection [5,6]. Conversely, persons with social exclusion appeared to give a lower estimate of room temperature and tended to have greater desire for warm food and drink, suggesting that social exclusion may be related to the cold feeling [7]. It was also found that physical coldness was linked to loneliness feeling and the tendency to have warm baths [8]. In primates, contact warmth and comfort with the mother monkey were found to be more significant to the infant monkey than food in maternal-infant bonding, and physical warmth was connected with reasonably normal social development following maturation [9]. Therefore, people are more likely to spend time with "warm" individuals. It was also suggested that physical warm and social warmth share a common neural mechanism [10]. Thus, it appears that body heat can transmit information from the body to the brain and intellect.

Despite of some evidence for the connection between physical warmth and social warmth, as mentioned above, the information for this connection in different ethnic and age populations with different culture and social experience is lacking. Therefore, in this study, we tried to evaluate whether individuals generate social warmth when they experience physical warmth in Chinese teenagers, so that we could evaluate whether cultural and age factors can affect the connection between physical warmth and social warmth.

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Table 1: The scores of friendliness provided by participants holding a hot drink and participant holding a cold drink.

	Holding hot Drink	Holding cold Drink	P value
The average score [#]	3.42	2.5	0.072
Percent of participants answer a score equal to or over 3	83%	50%	0.102

[#] On the scale of 1 to 5, higher score indicates more friendliness

Participants and Methods

Participants

Persons who volunteered to participate in this study were recruited from Kang Chiao International School, Taipei, Taiwan. Participants were healthy sophomore students of high school. Both genders were equally included in this study. Total 22 students were recruited into this study. Informed consents for participating this study were obtained from all participants and their parents.

Study design

Participants were randomly assigned to two groups, cold drink group and hot drink group. During the study period, each of participants was given a cold drink for the cold drink group and a hot drink for the hot drink group. This study was designed in the double-blind manner, so that the researcher did not know what kind of drink each participant was holding. After holding a drink for minutes, participants were given a scoring sheet to rate the feeling of friendliness. Personal friendliness was rated on the scale of 1 (unfriendly) to 5 (friendly). Data were collected from March to April in 2022.

Statistical analysis

The non-parametric Mann-Whitney test was utilized to test the significance of the difference between cold drink group and hot drink group. Chi-squared test was used for the statistical analysis of frequency. P-values were calculated, and when p-value was less than 0.05, it was considered significant.

Results

Participants in this study were Chinese students of a high school in Taiwan. The friendliness scores were obtained from participants holding a cold drink (the cold drink group) and from participant holding a hot drink (hot drink group). It was found that the average score of the cold drink group was 2.5 (standard deviation =1.08), whereas the average score average score of the hot drink group was 3.42 (standard deviation =1.16). Therefore, it appeared that participants hold a hot drink gave higher scores and felt more friendliness than participants hold a cold drink, although the difference in friendliness score between two groups did not reach statistical significance (Mann-Whitney test $p=0.072$) (Table 1).

We then calculated the frequencies of participants' answers with higher scores (equal to and greater than 3) for the cold drink and hot drink groups. It was found that 83% (10/12) of participants holding a hot drink and 50% (5/10) of participants holding a cold drink gave higher scores. Our findings indicated that individuals holding a hot drink have a higher chance of thinking a person is friendlier than those holding a cold drink. However, the difference in the frequency of participants' answers with higher scores between two groups did not reach statistical significance (Chi-squared test $p=0.102$).

Discussion

Interpersonal warmth is important for the friendly relationships between peoples in the society. We frequently encounter new people,

and it is important to make other people to give you a positive impression. We also tend to spend more time with those who we perceive as friendly. Impression-making can be determined in different ways, and it is possible that physical feeling of warmth can give a warm feeling in the heart and influence the impression on peoples we encounter. In other words, it is hypothesized that physical warmth may be connected to social warmth.

In this study, we tested the hypothesis of the connection between physical warmth and the social warmth by allowing participants to hold a cold drink or a hot drink. This study was conducted in the Chinese teenager population, so that we were able to analyze whether culture and age factors can influence the connection between physical warmth and social warmth. It appeared that, compared with people holding something cold, people holding something warm were more likely to think another person is friendly and therefore presumably were more likely to have a stronger social connection, although the difference between two groups was not statistically significant in this study. Our results showed discrepancy with the results from other studies. The major weak points of this study are that study groups have relatively small sample sizes, and that warm weather and environment in Taiwan could be a major confounding factor. Larger sample size may be needed to have clear conclusion on the connection between physical warmth and social warmth in this Chinese teenager population. However, it is also likely that the significance in the connection between physical warmth and social warmth is eliminated by other factors, such as culture, age with different social experience, and environmental warmth.

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