



Love is Soft and Heavy: Exploring the Concept of Love from a Sensory Perspective

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How to cite this paper: Liao, Y.F. (2026) Love is Soft and Heavy: Exploring the Concept of Love from a Sensory Perspective. *Open Access Library Journal*, 13: e14935.
<https://doi.org/10.4236/oalib.1114935>

Received: January 24, 2026

Accepted: February 11, 2026

Published: February 14, 2026

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Abstract

Love is a mysterious concept. From the perspective of conceptual metaphor theory, the concrete experience of our bodies may contribute to the formation of the concept of love. The present research investigated the relation between perceptions of softness and weight and the concept of love. Study 1 was conducted at night and found that love was perceived as soft and heavy. Study 2 and Study 3 were conducted to contrast different wordings of love. Results showed that, in the morning, different wordings of love (love, romantic love, love between men and women) and opposite-sex friend's love were perceived as soft. In the evening, females believed that love was softer than opposite-sex friend's love; males' perception of love and opposite-sex friend's love were similar in terms of softness. The weight perception of love displayed changes from morning to evening. Possible explanations were discussed.

Subject Areas

Psychology, Linguistics

Keywords

Love, Metaphor, Softness, Weight

1. Introduction

Love is accompanied by bodily experience. Tactile information was salient when people hold hands, hug, and kiss. In fact, tactile information is closely associated with love [1]. Conceptual metaphor theory proposes that individuals often rely on concrete concepts to understand abstract concepts [2]. Therefore, the concept of love may be shaped by the concrete experience of bodily sensations.

Softness is shown to be related to care, help and support. The famous experi-

ment conducted by Harlow displayed that softness was crucial to the formation of love for the Rhesus monkey [3]. For humans, a soft object can also serve as a security base. For example, individuals preferred soft stuff to hard stuff when facing uncertainty [4]. Soft objects were also preferred when individuals experienced negative social interactions [5] [6]. Therefore, softness can represent security and comfort. Another line of studies suggested that softness was an inherently pleasant sensory experience [7] [8]. According to these empirical findings, love may be associated with softness metaphorically.

Weight perception is formed based on sensory information. When an individual holds a gift, she/he can feel the weight of it. If the gift was prepared for the lover, the perception of weight may be associated with the concept of love. Intimate interactions can also make individuals aware that love is accompanied by bodily contact and that love can be associated with a sensory experience of weight. Furthermore, both sexual arousal and holding something heavy increase heart rate [1] [9]. Thus, one may perceive that love is like something heavy.

Love has several components, for example, passionate love, nurturant love and companionate love [10]. It was shown that sexual desire had unique autonomic nervous system responses whereas nurturant love did not [11]. Therefore, the sensory experiences of these components are different. Although the primary goal of the present work was to explore the concept of love, the different components of love were also examined in an exploratory way. It was expected that these components were connected in different ways to the perceptions of weight and softness.

There are different expressions of love. The word “love” is a broad concept including romance, care and passion in Chinese culture. “Love between men and women” focuses on the sexual aspects of love, highlighting the biological aspects and attraction between men and women. “Romantic love” emphasizes the romantic experience of love as well as sexual attractiveness. Finally, “opposite-sex friend’s love” usually refers to non-romantic love. In the present study, these different wordings were contrasted to explore the links between these components of love and perceptions.

To summarize, the present study aimed to investigate the conception of love from a sensory perspective and two hypotheses were generated:

H1: Love is perceived as soft rather than hard.

H2: Love is perceived as heavy rather than light.

2. Study 1

2.1. Participants

Forty participants (31 females) were enrolled from the Credemo platform, with ages ranging from 21 to 49 years old ($M = 30.6$, $SD = 7.14$).

2.2. Procedure

The survey was labeled as the Affective Experience Task. Participants first consented to the study and then completed a semantic categorization task. The se-

semantic categorization task included two questions: 1. Love is light/heavy. 2. Love is soft/hard. The options were randomized and presented. The word “love” was translated as “恋爱” and the task was presented in Chinese.

After filling in demographic information, participants answered two questions about their experience of intimate relationships: 1. Have you ever been in love before? 2. Are you in an intimate relationship now? Each participant received 1 RMB after they completed the questionnaire. This study was conducted in September and all responses were collected between 22:00 and 24:00.

2.3. Results

All participants reported experiencing romantic love, and 87.5% were in intimate relationships. There were no significant effects of sex or intimate relationship status ($ps > 0.16$).

Love was classified as soft in 85% of the responses, which was significantly higher than the chance level (Binomial test, $p < 0.001$). H1 was supported.

Love was classified as heavy in 67.5% of the responses, which was significantly higher than the chance level (Binomial test, $p = 0.038$). H2 was supported.

3. Study 2

3.1. Participants

One hundred and sixty participants (107 females) were enrolled from the Credemo platform. Their age ranged from 19 to 58 years old ($M = 32.08$, $SD = 8.63$).

3.2. Procedure

The survey was labeled as the Affective Experience Task. Participants first consented to the study and then were randomly assigned to one of four conditions to complete a semantic categorization task and a rating task. The wording of love was different across conditions. “恋爱” was used for love. “浪漫之爱” was used for romantic love. “男女之爱” was used for love between men and women. “异性间的友爱” was used for opposite-sex friend’s love.

The semantic categorization task included two questions: 1. Love is light/heavy. 2. Love is soft/hard. The options were randomized and presented. The word “love” was replaced by “恋爱” “浪漫之爱” “男女之爱” “异性间的友爱” in different conditions.

The rating task included one question: Do you think ____ match the concept of love? The blank was filled with the same word as the semantic categorization task. To avoid repetition, the prototype word “love” at the end of the sentence was translated as “爱情”, which is formal and commonly used in Chinese culture. Participants rated on a 5-point scale (1 = completely irrelevant, 5 = completely matched) to indicate how much the word used in the semantic categorization task matched the prototype of love.

Participants also reported demographic information and answered questions

about their experience of intimate relationships as in Study 1. Each participant received 1 RMB after they completed the questionnaire. The study was conducted in the daytime between 9:00-12:30 in October.

3.3. Results

Preliminary analysis

94.38% of participants reported experiencing romantic love. 71.88% of participants reported that they were in intimate relationships. Typicality ratings differed significantly across conditions (**Table 1**), $F(3, 156) = 18.6, p < 0.001, \eta_p^2 = 0.26$. Post hoc analysis suggested that the typicality ratings of friend's love were significantly lower than others ($ps < 0.001$). The friend's love seemed less matched to the concept of love compared to other wordings. Thus, words used in the semantic categorization task can be grouped into two categories: the prototype love category and the friend's love category. The friend's love served as a comparison group for the prototype concept of love. An additional independent t test revealed that males' ratings were higher than females', $t(158) = 2.27, p = 0.025$, Cohen's $d = 0.38$. The interaction effect of sex and condition was not significant ($p > 0.3$).

Table 1. Descriptive statistics.

	Love	Romantic love	Love between men and women	Friend's love
Proportion of "heavy"	45%	67.5%*	72.5%*	47.5%
Proportion of "soft"	97.5%***	80%***	82.5%***	77.5%***
Typicality rating ($M \pm SD$)	4.33 \pm 0.53	4.20 \pm 0.65	4.33 \pm 0.73	3.23 \pm 1.10

* $p < 0.05$, chance level = 0.5. *** $p < 0.001$, chance level = 0.5.

Main task

Softness perception. Binomial test revealed that participants tended to choose softness across all conditions ($ps < 0.001$). H1 was supported. Love was perceived as soft. Chi-square test suggested that the effect of condition was marginally significant, $\chi^2(3) = 7.35, p = 0.062$, Cramer's $V = 0.21$.

Weight perception. Binomial test suggested that "love between men and women" and "romantic love" were classified into the "heavy" class ($ps < 0.05$); in the cases of "love" and "friend's love", the responses were not significantly different from the chance level. Therefore, H2 was partially supported. Chi-square test revealed that the proportion of "heavy" option varied significantly across conditions, $\chi^2(3) = 9.53, p = 0.023$, Cramer's $V = 0.24$.

Sex effects. Chi-square test revealed that males were more likely to choose "heavy" than females, $\chi^2(1) = 3.13, p = 0.077$, Cramer's $V = 0.14$. A closer examination suggested that 66.7% of males chose "heavy" for "love", significantly higher than females (32%), $\chi^2(1) = 4.55, p = 0.033$, Cramer's $V = 0.34$. Sex effects were not significant in other conditions.

4. Study 3

4.1. Participants

One hundred and sixty participants (94 females) were enrolled from the Credemo platform. Their age ranged from 19 to 51 years old ($M = 29.8$, $SD = 7.30$).

4.2. Procedure

The procedure was the same as Study 2. However, this study was conducted at night between 20:00 and 22:00 in October.

4.3. Results

Preliminary analysis

87.5% of participants reported experiencing romantic love. 73.75% of participants reported that they were in intimate relationships. It was found that participants who were in intimate relationships were more likely to choose the “heavy” option than participants who were not in intimate relationships (67.80% vs 47.62%), $\chi^2(1) = 5.38$, $p = 0.02$, Cramer’s $V = 0.18$. No significant effects related to romantic experience were detected.

Typicality ratings differed significantly across conditions (Table 2), $F(3, 156) = 16.4$, $p < 0.001$, $\eta_p^2 = 0.24$. Post hoc test suggested that the typicality ratings of friend’s love were significantly lower than other wordings ($ps < 0.001$). No significant sex effects were detected ($ps > 0.27$). Therefore, words used in the semantic categorization task can be grouped into two categories as in Study 2: the prototype love category and the friend’s love category.

Table 2. Descriptive statistics.

	Love	Romantic love	Love between men and women	Friend’s love
Proportion of “heavy”	67.5%*	60%	67.5%*	55%
Proportion of “soft”	87.5%***	95%***	90%***	77.5%***
Typicality rating ($M \pm SD$)	4.05 \pm 1.06	4.38 \pm 0.67	4.10 \pm 0.84	2.95 \pm 1.26

* $p < 0.05$, chance level=0.5. *** $p < 0.001$, chance level = 0.5.

Main task

Softness perception. Binomial test revealed that participants tended to choose softness across all conditions ($ps < 0.001$). Therefore, H1 received support. Chi-square test revealed that the proportion of “soft” option didn’t differ significantly across conditions, $\chi^2(3) = 5.94$, $p = 0.11$. Note that the four conditions can be grouped into two categories: the prototype love category (including love, romantic love, and love between men and women) and friend’s love category. Chi-square test revealed that the prototype love category differed from the friend’s love in softness perception, $\chi^2(1) = 4.88$, $p = 0.027$, Cramer’s $V = 0.18$. A closer examination found that only in females the prototype love was more likely to be “soft”

than the friend's love (92.5% vs 74%), $\chi^2 (1) = 5.89, p = 0.015$, Cramer's $V = 0.25$.

Weight perception. Binomial test suggested that "love between men and women" and "love" were classified into the "heavy" class ($ps < 0.05$); in the cases of "romantic love" and "friend's love", the responses were not significantly different from the chance level. Therefore, H2 was partially supported. Chi-square test revealed that the proportion of "heavy" option didn't differ significantly across conditions, $\chi^2 (3) = 1.92, p = 0.59$. When responses were combined into the prototype love category (including love, romantic love, and love between men and women) and friend's love category, chi-square test revealed no significant differences, $\chi^2 (1) = 1.28, p = 0.26$. No significant sex effects were detected ($ps > 0.13$).

5. Discussion

Love was perceived as soft across studies, which is in accordance with the notion of conceptual metaphor theory [2]. The concrete, soft experience is integrated into the concept of love. Softness is related to pleasantness [8] and it was found that human-like softness elicits high tactile pleasantness [7]. Furthermore, softness may be related to sensory feelings of nurturant love. For example, soft, comfortable contact was related to security [3]. In Chinese, love (恋爱) and attachment (依恋) share the same word "恋", which suggests that the concepts of love and attachment share similarities in Chinese culture.

In several cases, love was perceived as heavy rather than light. The effect was most pronounced in the case of "love between men and women". This pattern seems unlikely to be a result of associating love with holding a gift, given that the weight perception of love changed a lot across different wordings. A more plausible explanation is that the weight perception of love is related to passionate love. Firstly, the experience of sexual arousal may serve as a cue for weight perception [11]. Secondly, cuddling was related to sexual intimacy [12] and the experiences of bodily interactions may influence the perception of weight.

Study 2 found that males and females differed in the weight perception of "love", with males giving higher estimations. Generally, males have stronger sexual desire than females [13] and are more likely to interpret vague information sexually [14]. The word "love" may be vague because it does not convey salient information about sex. When the sexual aspects of love were emphasized (e.g., "love between men and women"), the sex differences disappeared.

It is intriguing to explore the timing when participants entered the survey. Study 1 was conducted in the evening and all participants submitted the questionnaires between 22:00 and 24:00. In contrast, Study 2 was conducted in the morning between 9:00 and 12:30. Because healthy males experience elevations of plasma testosterone and sexual arousal in the early morning [15]-[17], it's possible that different perceptions of love were evident between males and females in Study 2. These effects were not salient in Study 1 possibly because sexual activities were common for both sexes at night.

It was displayed that softness perceptions of love and friend's love were differ-

ent. In the morning, love was perceived as quite soft. At night, females perceived love as softer than friend's love. Generally, females are more likely to provide emotional support and are perceived as tenderer than males [18]-[20]. When friend's love was considered, attention may be directed to the friend and females' softness perception of opposite-sex friend's love was not very high. When love was considered, the participants may rely on bodily experiences. Taken together, both softness perception and weight perception help to distinguish love from friend's love; females may be sensitive to softness and males may be sensitive to heaviness.

Passionate love, nurturant love and companionate love are regarded as components of love [10]. The present study illuminated how they are integrated into the concept of love from the perspective of sensory perceptions. The perception of softness was closely related to love, which was in accordance with the finding that the nurturant aspect was embedded in the concept of love [21]. The perception of weight was evident in the case of "love between men and women", reflecting the association between weight perception and passionate love. Across studies, the tendency to choose the "heavy" option for friend's love did not differ significantly from the chance level, suggesting a lack of intense feeling. The moderate level of softness perception of friend's love may facilitate cooperation and negotiation with friends, reflecting signals of companionate love.

The temporal model of love posited that love evolved across time [10]. The present study provided a micro perspective of temporal dynamics and raised the possibility that the perception of love could vary from morning to night. In the morning, different wordings of love were perceived differently; at night, the similarities of these wordings were more evident. The perceptions of "opposite-sex friend's love" and "love between men and women" were relatively stable across Study 2 and Study 3, suggesting that these concepts are clear and stable for Chinese adults. In contrast, the generic term "love" is vague and the perception of it is sensitive to the time.

The present study also contributed to the emotional reaction theory of attractiveness [22]. The concept of love is richer than hypothesized before. In the morning, love was perceived as something like friendship. The nurturant love was believed to occur when one provides support to another. Present findings suggested that some aspects of the nurturant love also exist in the concept of "love" and "romantic love". There may be more signals of love than what the theory proposed.

There were several limitations of the present study. Firstly, the cross-sectional method may result in selection bias because individuals active in the morning may be different from individuals attending the survey at night. Therefore, future research may consider the timing of measurement and adopt more rigorous methods to explore the concept of love. Secondly, the present findings may be limited to the fall season since the research was conducted in September and October. Because subjective mood fluctuated across the year [23], the concept of love may evolve as well. Further research is needed to address this question. Finally, the

weight perception of love showed considerable variations across studies. It's unclear whether the weight perception of love comes from stable individual differences or contextual factors, and these possibilities should be investigated in the future. Because Study 3 found that the current status of intimate relationships influenced the weight perception of love, further work can explore the mechanism of the link between relationship status and the weight perception of love.

6. Conclusion

Present research found that love was consistently perceived as soft. The weight perception of love was dependent on the time of day and specific wordings.

Ethics Statement

All participants were involved in the study voluntarily. Informed consent was obtained prior to the study and all responses were anonymous. Study 1 was approved by College of Design and Innovation at 2025/9/15. Study 2 and Study 3 were approved by College of Design and Innovation at 2025/9/22.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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