



“Inquiring Love of This World”: An Implicit Love Theory of Chinese University Students

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Abstract

This paper reports a preliminary descriptive approach to the representation of the concept of love. Based on Spreading Activation Model, the word of love was presented as a stimulus to which 278 college students were asked to respond with at least 15 words/phrases that came to mind. Then top 100 love-related words/phrases with frequency above 4.3% were collected as units of analysis. Based on the interrelations among those words/phrases, a complete-linkage cluster analysis reached 5 high-order clusters, i.e. the five facets of the representation of love concept: 1) ethics and responsibilities; 2) romantic experience; 3) conflict and pain; 4) rationality; 5) friendly care. The results show that word associations can fundamentally reflect some differences in cognition and culture of love. Compared with Sternberg's triangular theory of love, the findings show differences in two clusters: “conflict and pain” and “rationality”, which are not included in the triangle of love. More importantly, this research contributes to literatures on Chinese people's love and will also inspire future research with some meaningful results.

Keywords: Love, Conceptual representation, Word association, Cluster analysis, Social cognition, Interpersonal attraction

1. Introduction

Love, as the highest form of interpersonal attraction, is an age-old and eternal topic. However, the significance of it has not been sufficiently reflected in the psychological science. Even in the west, a decision by the National Science Foundation (NSF) in the 1970s for funding an \$84,000 study on liking and love was strongly opposed by Senator William Proxmire (Wu, Dai & Feng, 2000). Up till today, there have been only a few social psychologists who had conducted researches on this subject and advanced some theories. We believed that, love as a social construct which has strong cultural features, must contain rich meanings or connotations. These implications are different from each other because of various cultures and different groups which people belong to. When psychologists start to study love, the first thing is to work out the concept of love, and how many basic components it contains, or the question of the representation (or structure) of love.

In the west, Zick Rubin (1970,1973) first initiated the difference between love and liking; Robert J. Sternberg's (1986, 1988) triangular model of love is another major conceptualization of love, which suggests each love relationship contains three basic components, i.e. intimacy, passion and commitment. Intimacy refers to feelings of closeness, connectedness, and bondedness in loving relationships, as well as admiring and wanting to take care of the loved one, and it can bring up warm feelings. Passion is a state of intense longing for union with the other. The decision/commitment refers to the responsibilities to maintain that love relationship. Sternberg supported his hypothesis by factor analysis in further studies. Davis's (1985) cluster theory and Fehr's (1988, 1991) prototype approach also answered the question of the love structure. The cluster theory (Davis, 1985) assumed that love is friendship plus the "passion cluster" and the "caring cluster". Friendship is characterized with eight main elements: enjoyment, acceptance, mutual assistance, respect, spontaneity, trust, understanding, and confiding. Besides these, romantic love contains two more clusters: passion cluster, which contains three characteristics--fascination, sexual desire, and exclusiveness; and care cluster, which has two components--giving the utmost, and being a champion/advocate. Canadian psychologist Fehr *et al.* (1991) conducted a series of 6 studies and found that love is better understood from a prototype perspective than from a classical one. The natural language concept of love has an internal structure and fuzzy borders: maternal love, romantic love, affection, love of work, self-love, infatuation, and other subtypes of love can be reliably ordered from better to poorer examples of love. In turn, each subtype's goodness as an example of love (prototypicality) was found to predict various indices of its cognitive processing.

We assumed that everyone has his/her own implicit love theory deriving from his/her former experience which contributes to answering the questions of what the concept of love contains and the interrelationship among these factors. Considering such implicit concept is quite different from academic conceptualizations, and is also quite different from the patterns of love expressed by explicit actions in real life, and following the examples of "implicit personality theory", "implicit intelligence theory" and the "implicit leadership theory", we referred to it as "implicit love theory". Although the implicit love theory is not expressed by explicit behavior and may not be so "scientific", it reflects individuals' internal psychological activities and some cultural features which, in turn, can influence and direct one's behavior. Such implicit theoretical approach has been employed by several psychologists in China, e.g. in the studies of intelligence (Zhang & Wu, 1994), creativity (Yang *et al.*, 2001) and wisdom (Zhang & Dong, 2003). The present study, following such a method, aims at probing university students' comprehension of love in the context of Chinese culture with content analysis on word-association responses.

Word association test, as a research technique, was pioneered by the English explorer, amateur scientist, and psychologist Sir Francis Galton (1822-1911) and published in 1879/80 in the journal of *Brain*, then reinvented in 1904 as a diagnostic aid or projective test by the Swiss psychologist Carl Gustav Jung (1875-1961), but seldom used in social psychology studies. Pečjak (1993) Surveyed 50 college students from a Slovenian university in 1969, 1991, and 1993 respectively to determine typical associations with some political, ideological, and social concepts. Responses were scored and weighted and then compared across groups. To his surprise, the scores from 1993 after the collapse of the Soviet Union were closer to those from 1969 than to those from 1991. In China, Xie and Xu (1995) once used word association test in the study of risk cognition by asking the subjects to go through three free associations with the word "risk" as the stimulating word, it's also a rewarding attempt with some valuable results found.

The present study's purpose is to reveal the concept of love in the mind of Chinese university students. Major models concerning internal structure of concepts, or conceptual representation includes: 1) Hierarchical Network Model; 2) Feature Comparison Model; 3) Spreading Activation Model; 4) Prototype Model (Wang, 1984; Peng & Tan, 1991). As known to all, concepts exist in our mind in the form of a system instead of existing separately. The relationship among those concepts may be opposite, close, similar, belonging or part-and-whole. Strictly speaking, it was the mental structure of "love-related concepts" that this research studied, not a studying of the concept of love directly. We did so based on the Spreading Activation Theory (Collins & Loftus, 1975), which hypothesizes that the meaning or information such as category membership and attributes of a certain concept lies in various relationships between the concept and other concepts. The connotation of the concept was represented by those connected concepts, especially those that have strong associations with it. Analyzing "concepts" and "relationship" makes the Spreading Action Model simpler and more flexible. Moreover, a concept is connected with many other concepts, thus it can be situated in different planes of the network (Peng & Tan, 1991). Therefore, only through analysis of words and expressions can we explore the mental representation of love from the most basic level.

2. Method

2.1 Subjects

Group I: 278 undergraduate students (100 males and 175 females and 3 gender data missing);

Group II: 100 undergraduate students (47 males and 53 females)

2.2 Material

Every 100 cards in dimension of 14.85cm×4.20cm as a set

2.3 Design and steps

Items were collected from free word associations with restrictions and initially sorted by content analysis, and then a hierarchical cluster analysis upon these data was run.

2.3.1 Collecting words/phrases

For Group I subjects, each of them was given a sheet of paper and asked to respond to the stimulating word “love” with at least 15 words/phrases that came to mind and they are considered as showing the connotation (contents) of love, no repeat of words/phrases and no time limit.

2.3.2 Frequency descriptions

Content analysis and frequency counting were conducted to all responses (including blank items) collected. First, items were reduced by “merging the perfect synonyms” with items of low frequencies merged into those of high frequencies, e.g., because “chao[3] jia[4]”, “zheng[1] chao[3]”, and “chao[3] zui[3]” have the same meaning, they were represented with one item, “chao[3] jia[4]” which corresponds the word of quarrel in English. Parasyonyms or near synonyms such as “ai[4] mu[4]” (admire) and “xi[3] huan[0]” (like) were maintained without merging. Then their frequencies were counted with Microsoft Excel 2000, and the top 100 frequent words were obtained, with frequencies above 4.3%.

2.3.3 Selecting items for analysis

The 100 high frequency words were typed on the left of cards with corresponding serial numbers on the right, one card with one word. 100 cards are considered as a set of material including the following written instructions: “Each concept can be represented by a word. Now there are 100 words/phrases representing 100 concepts related to love, please sort them out according to their interrelation, that is, to try to classify them into as less piles as you can, so that each pile represents one kind of concepts. Note that you should not sort them by their linguistic or grammatical features (e.g. syntactical functions, word-frequency, word-structure etc). You classify them only by the interrelation of their meanings. There is no right or wrong in doing this. It depends on yourself how many piles you want to reach, so don’t be so nervous, just sort them by your own reasons. You can make adjustments again and again until you are satisfied. So you need to spend time in thinking about it. Thanks for your participation and cooperation!”

2.3.4 Classifying items

Group II subjects were asked respectively to sort the 100 concepts (words) by following the instruction. Results were recorded after each sorting according to the rules developed by the researchers.

2.3.5 Constructing similarity matrix

For any random pair of words, the times that they were sorted into one pile (or how many persons sorting these two words into one pile) were counted. Then with the statistical result as the measure of similarity of the two words, a 100×100 lower triangular matrix was constructed.

2.3.6 Running cluster analysis

A complete-linkage cluster analysis based on the matrix data obtained was run with SPSS PC+ 5.0.

3. Results

3.1 Association strength of each word

A total of 5,267 words/phrases were collected. The summated frequency of top 100 words/phrases totals 2,472, accounting for 46.93% of the total. Association Strength (AS) of each word was defined by the researchers as the percent of subjects who respond with the word. (Insert table 1 here)

3.2 Preliminary results of cluster analysis (using complete-linkage method)

In a preliminary solution, 14 basic clusters were reached when cutting the cluster dendrogram at $d=0.28$ (the distance here is similarity). (Insert table 2 here)

3.3 The final results of the cluster analysis

The results from the complete-linkage analysis are shown below as in Figure 1. (Insert Figure 1 here)

Drawing a vertical line at $d = 0.13$ on the dendrogram divides the data into five high-order clusters. (Insert Table 3 here)

Based on summated frequencies, their relative percents are shown in Figure 2. (Insert Figure 2 here)

It can be seen from the dendrogram that, if a two-cluster resolution at $d=0.04$ was adopted, these items could also be divided into two super clusters, one can be referred as “love starting with *Qing* (a Confucian term equal to emotions)” which contains “romantic experience” and “conflict and pain”; the other as “love resting in *LiYi* (a Confucian term equal

to propriety and righteousness)” which contains “Ethics and Responsibilities”, “Rationality”, and “Friendly Care”. As for the percentages, “love starting with *Qing*” accounts for 47%, while “love resting in *LiYi*” accounts for 53%, a little higher than the former.

4. Discussion and conclusion

4.1 The Significance of averaged association strength and relative proportion

In the study, we define the strength of a cluster as the averaged association strength of items in the cluster and relative proportion as the accumulative frequency.

The results in Table 2 show that from the perspective of averaged AS (association strength), the strongest basic cluster is “love-related experience (part one)”, which concerns with the aesthetic experience of love, approximately corresponds to the B-love defined by Maslow, while “love-related experience(part two)” that corresponds to D-love is not so strong, with a much lower AS of 6.55. This shows that Chinese undergraduates tend to associate love experience more idealistically, which suggests they have a type of love originating from personality adequacy rather than personality inadequacy. Basic clusters that follow are “family relations”, “marriage life”, “responsibilities”, which explicitly indicate that, for Chinese university students, the morals and responsibilities are more closely related with love.

The results of high-order clusters in Table 3 show that the strongest one is “ethics and responsibilities”, followed by “romantic experience”. As for the relative proportion, the biggest cluster is “ethics and responsibilities”, and then romantic factors. The results of high-order clusters are quite consistent to that of the basic clusters. These two factors above constitute the majority of the association responses. The factor of “conflict and pain” ranks third and the other two factors take only a little proportion.

In general, “romantic” “conflict” and other factors are all coming after “ethics and responsibilities”. This shows that Chinese university students associate love more frequently with ethics and marriage, which reflect the social rationality of love, or “*die himmlische Liebe*” (in German). “Romantic”, the AS of which is a little bit lower than that of “ethics and responsibilities”, is also a high-order cluster, showing the individual sensation and biological nature of love, or “*die sinnliche Liebe*” (in German). The pattern that the two factors match each other in strength basically coincides with the Confucian view of love, which considers love as “starting with *Qing*” and “resting in *LiYi*” (The Great Preface, The Book of Songs).

4.2 Comparison with other love theories

We mentioned the studies of love structure by Sternberg (1986, 1988), Davis (1985) etc. Besides their studies, some researchers from China also put forward their points of view on love structure. For example, my late mentor Chiang-Lin Woo (also Jianglin Wu, 1914-1995) holds that there are three differences between love and interpersonal attraction of general meaning: tender feelings (include passionate love and companionate love), sexuality, and reproduction. The latter two factors constitute the contents of sexual behavior. Xi-Ting Huang *et al.* (1998) contend that love structure contains three components: sexual psychology, values of love, morals. Zhi-Cang Zhang (1998) argues that love is composed of sexuality, feelings, morals and ethics, and rationality. It can be concluded from our study that there are five aspects to the representation of love in Chinese university students’ mind: 1) ethics and responsibilities; 2) romantic experience; 3) conflict and pain; 4) rationality; 5) friendly care. Our findings are similar to Z. Zhang’s.

It is obvious that sex is mentioned by many researchers. In our study, the reflection of sex is splitting. Though the romantic cluster is found with words with passionate color such as “kiss”, “embrace”, it differs from the passion components in Sternberg’s theory. The latter is a kind of drive aroused on basis of sexual desire, which is irrational and can be aroused in a very short period, while the romantic factor in this study contains more intimacy, Chinese set phrases such as “liang[3] qing[2] xiang[1] yue[4] (to adore each other and to enjoy mutual pleasure)”, “xin[1] xin[1] xiang[1] yin[4] (have mutual affinity)”, and “qing[1] mei[2] zhu[2] ma[3] (green plums and a bamboo horse—lovers who played with each other in their childhood)” reflect the intimacy between a man and a woman. It is worth noting that the most interesting phenomenon is Chinese students’ categorization of the word “xing[4] (sex)”. In Sternberg’s study, sex, kiss and embrace obviously belong to the passion component. He argues that it is sexual desire that arouses passionate experience of love; in our study, sex is contained in “ethics and responsibilities”, which belongs to the contents of marriage life. The difference derives from cultural differences. People in the west are more open and the sexual behavior before marriage is acceptable to them, while Chinese people, under the influence of Confucian culture of “the rule that males and females shall not allow their hands to touch in giving or receiving anything” (The Works of Mencius, cf. Legge, 1895), regard sex as serious and cautious.

Some of the five aspects concluded from this study intersect with Sternberg’s theory. “Friendly care”, “romantic”, “ethics and responsibilities” correspond to the three components in Sternberg’s triangular model respectively, but they are not completely coincident. For example, Sternberg’s intimacy component contains more contents than friendly care does. Decision/commitment is basically equal to Chinese set phrases such as “tian[1] chang[2] di[4] jiu [3] (everlasting and unchanging)”, “zhong[1] zhen[1] bu[4] yu[2] (unswervingly loyal)”, “hai[3] shi[4] shan[1] meng[2] (make a

solemn pledge of love)" (Li, 1996). These words/phrases are not just included in our study, they are also found with high frequencies. In addition, there are many words appeared in the study involving treating each other well, such as "sincere", "hold", "trust", "understand", "support", "care for". These words are mentioned in Sternberg's triangular theory and they are thought to be crucial to maintain their mutual intimate relationship (Sternberg, 1988). A difference to be noted is that, in present study, these words belong to "ethics and responsibilities" and "friendly care" clusters respectively.

The major difference between the conclusion of our study and Sternberg's theory is: "conflict and pain" and "rationality" are not found in the triangular love theory. This may be resulted by the different method employed by the researchers in collecting data. However, the factors of conflict and realistic rationality are indispensable in love (including marriage). Love brings to people not only wonderful experience but also frustration and conflicts. Rationality is also thought as "the intrinsic contents of love" (Zhi-Cang Zhang, 1998, p.51). The existence of these two factors reflects the relative maturity of contemporary undergraduates' view of love. To them, love no longer exists spiritually or inside the ivory tower. They show more rationality instead of idealizing love in terms of absolutes. A recent investigation to undergraduates' attitude to love shows that they would consider both ideal and reality factors in selecting mates (X. S. Li, 2003). Nevertheless, "ethics and responsibilities" and "reality" are still the final factors that they would consider.

4.3 Suggestions for further research

It should be noted that we only analyzed the words with higher frequencies, the other words with lower frequencies not analyzed account for 53% of the total. Does the content of the words with lower frequencies have the same structure with what we have analyzed? Can the results concluded in the study be confirmed? All these questions require us laying more emphasis on the analysis of those words with lower frequencies in future research.

The study was based on the Spreading Action Model, with concepts as unit of analysis, and employed a relative simple method of free word association, therefore the love structure concluded by the researchers may be superficial to some extent, and may deviate from the traditional implicit-theoretical approach. For example, Jing Yan (2004) along the traditional route found that in Chinese culture the adults' concept of love contains four components: "intimate relationship", "passion", "responsibilities", and "loyalty", which shows high coincidence with Sternberg's theory. So our conclusions need to be verified in further studies. We couldn't have touched upon one's deep psychological status that much by just asking them to complete a simple test. We need to collect data containing more information for analysis in further studies.

Also, the subjects in present research responded to the stimulus materials with lower self-involvement, as "spectators" rather than "players", so it is difficult to ensure that they hold the same attitudes in their own real life. Therefore, future researches to the nature of love should pay more attention to individuals' behaviors that express their psychological activities of love, such as mate selection, dating and marital decision and so on.

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References

- Collins, A. M., & Loftus, E. F. (1975). A spreading-activation theory of semantic processing. *Psychological Review*, 82, 407-428.
- Davis, K. E. (Feb, 1985). Near and dear: Friendship and love compared. *Psychology Today*, 19 (2), 22-30.
- Fehr, B. (1988). Prototype analysis of the concepts of love and commitment. *Journal of Personality and Social Psychology*, 55, 557-579.
- Fehr, B., & Russell, J. A. (1991). The concept of love viewed from a prototype perspective. *Journal of Personality and Social Psychology*, 60 (3), 425-438.
- Huang, X. T., Zheng, Y., et al. (1998). *Psychological characteristics of contemporary Chinese university students and education*. Shanghai: Shanghai Education Press.
- Legge, J. (1895). *The Chinese classics: Vol. 2. The works of Mencius*. Oxford, UK: Clarendon Press.
- Li, X. S. (2003). The undergraduates' amatory mental trait and behavioral analysis. In Bin Zuo (Ed.), *Development and*

- Innovation of Social Psychology* (pp. 111-117). Wuhan, HB: Central China Normal University.
- Li, Z. X. (1996). Comments on R. J. Sternberg's triangular theory of love. *Research in Social Psychology*, 27 (3), 59-63.
- Pečjack, V. (1993). Verbal associations with sociopolitical concepts in three historical periods. *Studia Psychologica*, 35 (4-5), 284-287.
- Peng, D. L., & Tan, L. H. (1991). *Linguistic psychology*. Beijing: Beijing Normal University.
- Rubin, Z. (1970). Measurement of romantic love. *Journal of Personality and Social Psychology*, 16, 265-273.
- Rubin, Z. (1973). *Liking and loving: An invitation to social psychology*. New York: Holt, Rinehart and Winston.
- Sternberg, R. J. (1986). A triangular theory of love. *Psychological Review*, 93, 119-135.
- Sternberg, R. J. (1988). *The triangle of love*. New York: Basic Books.
- Waley, A. (1973). *The book of songs*. New York: Grove Press.
- Wang, S. (1984). Studies on conceptual structure in contemporary Western psychology. *Foreign Psychology*, 12 (1), 22-27.
- Wu, J. L., Dai, J. L., & Feng, W. (2000). *Social psychology*. Guangzhou, GD: Guangdong Education Press.
- Xie, X. F., & Xu, L. C. (1995). The nature of risk: An association test. *Psychological Science*, 18 (6), 331-333.
- Yan, J. (2004). A study on Chinese urban adults' implicit theories of love. Unpublished Master's Thesis. Shanghai: East China Normal University.
- Yang, Z. L., Cai, H. J., & Fu, Q. J. (2001). The research of undergraduates' implicit theories of creativity. *Psychological Science*, 24 (6), 641-645.
- Zhang, H. C., & Wu, Z. (1994). A survey of the Beijing public's view on intelligence. *Psychological Science*, 17 (2), 66-69.
- Zhang, W. D., & Dong, H. (2003). A study on urban people's implicit theory of wisdom. *Psychological Science*, 26 (3), 419-421.
- Zhang, Z. C. (1998). Analysis on the structure of love. *Journal of Humanities*, (2), 48-54.

Table 1. Association Frequencies of the Top 100 Words/Phrases (N=278)

Words/phrases (the Chinese Phonetic System)	English translation	Frequency	AS
ai[4] ren[0]	husband or wife; sweetheart; lover	36	12.95
bai[2] tou[2] dao[4] lao[3]	live in conjugal bliss to a ripe old age; remain a devoted couple to the end of their lives; remain happily married to a ripe old age	35	12.59
bang[1] zhu[4]	Help	15	5.40
bao[1] rong[2]	pardon; forgive; contain; hold	18	6.47
chao[3] jia[4]	quarrel; wrangle; have a row	39	14.03
chun[2] jie[1]	pure; clean and honest; purify	17	6.12
deng[3] dai[4]	wait; await	13	4.68
dian[4] hua[4]	phone; telephone; phone call	16	5.76
fen[2] shou[3]	part company; say good-bye	38	13.67
feng[4] xian[4]	offer as a tribute; present with all respect	12	4.32
fu[4] chu[1]	pay; expand	19	6.83
fu[4] mu[3]	parents; father and mother	19	6.83
gan[3] jue[2]	sense perception; sensation; feeling; feel; perceive; become aware of	13	4.68
gan[3] qing[2]	emotion; feeling; sentiment; affection; attachment; love	13	4.68
gong[1] zuo[4]	work; job; operate	20	7.19
gou[1] tong[1]	communication; link up	15	5.40
guan[1] xin[1]	be concerned about; show solicitude for; care for; be interested in	32	11.51
guan[1] huai[2]	show loving care for; show solicitude for	15	5.40
guang[4] jie[1]	stroll around the streets; go window-shopping	13	4.68
hai[2] zi[0]	child; children; son or daughter	28	10.07
hai[3] ku[1] shi[2] lan[4]	(even if)the seas run dry and the rocks crumble	25	8.99
hai[3] shi[4] shan[1] meng[2]	(make)a solemn pledge of love	20	7.19
huan[4] nan[4] yu[3] gong[4]	go through thick and thin together; share weal and woe	14	5.04
hui[2] yi[4]	call/bring to mind; recollect; recall	15	5.40
hun[1] yin[1]	marriage; matrimony	63	22.66
jia[1] ting[2]	family	64	23.02
jie[1] wen[3]	kiss	25	8.99
jie[2] hun[1]	marry; get married; be married	27	9.71
jin[1] qian[2]	money	19	6.83
ke[3] wang[4]	thirst for; long for; yearn for	12	4.32
kuai[4] le[4]	happy; joyful; cheerful	45	16.19
kuan[1] rong[2]	tolerant; lenient	32	11.51
lang[4] man[4]	Romantic	88	31.65
li[3] jie[3]	understand; comprehend	61	21.94
lian[4] ai[4]	romantic love; love affair; be in love; have a	17	6.12

	courtship		
Liang[2] Zhu[4]	Liang & Zhu; LIANG Shan-Bo & ZHU Ying-Tai	23	8.27
liang[3] qing[2] xiang[1] yue[4]	to adore each other and to enjoy mutual pleasure; To adore each other and to enjoy happiness together	16	5.76
lü[3] xing[2]	travel; journey; tour	14	5.04
luo[2]mi[3]ou[1] yu[3] zhu[1]li[4]ye[4]	Romeo and Juliet	12	4.32
mei[2] gui[0]	rose	53	19.06
mei[3] hao[3]	fine; happy; glorious; magnificent	31	11.15
mei[3] li[4]	beautiful; pretty	15	5.40
mei[3] man[3]	happy; perfectly satisfactory	16	5.76
peng[2] you[0]	friend; boyfriend or girlfriend	17	6.12
ping[2] dan[4]	flat; insipid; prosaic; pedestrian	13	4.68
qian[1] gua[4]	worry; care	18	6.47
qian[1] shou[3]	hand in hand	28	10.07
qiao[3] ke[4] li[4]	Chocolate	22	7.91
qin[1] mi[4]	close; intimate	14	5.04
qin[1] qing[2]	emotional attachment among family members	16	5.76
qing[1] mei[2] zhu[2] ma[3]	green plums and a bamboo horse---a girl and a boy playing innocently together; a man and a woman who had an innocent affection for each other in childhood	13	4.68
qing[2] ren[2]	sweetheart; lover	13	4.68
qing[2] ren[2] jie[2]	St Valentine's Day	22	7.91
san[4] bu[4]	take a walk; go for a walk; go for a stroll	12	4.32
shang[1] xin[1]	sad; grieved; broken-hearted	20	7.19
sheng[1] huo[2]	life; live; livelihood	30	10.79
shi[1] lian[4]	be disappointed in a love affair; be jilted; get a "Dear John" letter; (of sb. in love) lose the love of the other party	12	4.32
shi[4] ye[4]	career; cause; undertakings	28	10.07
si[1] nian[4]	miss; long for; think of	37	13.31
ti[3] tie[1]	show consideration for; give every care to	21	7.55
tian[1] chang[2] di[4] jiu [3]	everlasting and unchanging; enduring as the universe	73	26.26
tian[2] mi[4]	Sweet, happy	108	38.85
tong[2] gan[1] gong[4] ku[3]	share weal and woe (or share comforts and hardships, joys and sorrows)	14	5.04
tong[4] ku[3]	pain; suffering; agony; bitter	42	15.11
wei[4] lai[2]	future; tomorrow	21	7.55
wen[1] nuan[3]	warm	17	6.12
wen[1] rou[2]	(usu. of woman) gentle and soft	15	5.40
wen[1] xin[1]	soft and sweet; warm	23	8.27
wu[2] nai[4]	cannot help but; have no choice; have no	13	4.68

	alternative; but; however		
xi[3] huan[0]	like; love; be fond of; be keen on; happy; elated; filled with joy	13	4.68
xian[1] hua[1]	flowers; fresh flowers	19	6.83
xian[4] shi[2]	reality; actuality; real; actual	22	7.91
xiang[1] jing[4] ru[2] bin[1]	(of husband and wife)treat each other with respect due to a guest	15	5.40
xiang[1] ru[2] yi[3] mo[4]	(of stranded fish) moisten each other with spit----give one's meagre resources to help another in time of need	20	7.19
xiang[1] si[1]	pine with love; yearn for sb's love; languish with lovesickness	16	5.76
xin[1] xin[1] xiang[1] yin[4]	have mutual affinity; be kindred spirits	15	5.40
xin[1] you[3] ling[2] xi[1]	hearts which beat in unison are linked	13	4.68
xin[4] ren[4]	trust; have confidence in	35	12.59
xing[4]	sex; sexual behavior	13	4.68
xing[4] fu[2]	happiness; well-being	98	35.25
xue[2] xi[2]	Study; learn; emulate	15	5.40
yan[3] lei[4]	Tears	15	5.40
yi[1] jian[4] zhong[1] qing[2]	fall in love at the first sight	20	7.19
yi[1] kao[4]	rely on; depend on; sth to fall back on; support; backing	21	7.55
yi[2] qing[2] bie[2] lian[4]	shift one's love to another person; leave for another person; reject or cast off a previously accepted lover	12	4.32
yong[1] bao[4]	embrace; hug; hold in one's arm	24	8.63
yong[3] heng[2]	eternal; perpetual	24	8.63
you[3] qing[2]	friendship; friendly sentiments	20	7.19
yuan[2] fen[4]	lot or luck by which people are brought together	22	7.91
yue[1] hui[4]	arrange a meeting; make an appointment; appointment; engagement; date	14	5.04
ze[2] ren[4]	duty; responsibility; responsibility for a fault or wrong; blame	52	18.71
zhao[1] zhao[1] mu[4] mu[4]	be together from morning to night	15	5.40
zhen[1] cheng[2]	sincere; genuine; true	20	7.19
zhi[1] chi[2]	support; back; stand by; sustain; hold out; beat	20	7.19
zhi[1] zi[3] zhi[1] shou[3], yu[2] zi[3] xie[2] lao[3]	give me your hand, I'll hold, and live with me till old	18	6.47
zhong[1] cheng[2]	loyal; faithful; staunch	15	5.40
zhong[1] zhen[1] bu[4] yu[2]	unswervingly loyal	14	5.04
zhuan[1] yi[1]	single-minded; concentrated; be constant in love	18	6.47
zi[4] si[1]	selfish; self-centered	12	4.32
zun[1] zhong[4]	respect; value; esteem; serious; proper	27	9.71

Table 2. Results of Hierarchical Cluster Analysis at d=0.28

Code	Description of Cluster	Contents of Items	Averaged AS
XIII	Love-related Experience (part one)	zhuan[1] yi[1], chun[2] jie[1], kuai[4] le[4], mei[3] hao[3], mei[3] li[4], wen[1] rou[2], tian[2] mi[4], qin[1] mi[4]	11.83
IV	Family relations	fu[4] mu[3], qin[1] qing[2], jia[1] ting[2], hai[2] zi[0], wen[1] nuan[3], guan[1] huai[2], qian[1] gua[4], xing[4] fu[2], mei[3] man[3], wen[1] xin[1]	11.29
VI	Marriage life	ai[4] ren[0], xing[4], hun[1] yin[1], jie[2] hun[1], sheng[1] huo[2], gan[3] qing[2]	10.91
VII	Responsibilities And commitment	ze[2] ren[4], fu[4] chu[1], zun[1] zhong[4], ti[3] tie[1], yi[1] kao[4], li[3] jie[3], xin[4] ren[4], zhi[1] chi[2], tian[1] chang[2] di[4] jiu [3], yong[3] heng[2], bai[2] tou[2] dao[4] lao[3], xiang[1] ru[2] yi[3] mo[4], zhi[1] zi[3] zhi[1] shou[3] yu[2] zi[3] xie[2] lao[3], huan[4] nan[4] yu[3] gong[4], tong[2] gan[1] gong[4] ku[3], xiang[1] jing[4] ru[2] bin[1], zhong[1] zhen[1] bu[4] yu[2]	10.22
XI	Tangible signs of romantic love	lang[4] man[4], yue[1] hui[4], mei[2] gui[0], qiao[3] ke[4] li[4], qing[2] ren[2] jie[2], xian[1] hua[1], jie[1] wen[3], yong[1] bao[4], qian[1] shou[3], lian[4] ai[4], yuan[2] fen[4], liang[2] Zhu[4], luo[2]mi[3]ou[1] yu[3] zhu[1]li[4]ye[4], qing[1] mei[2] zhu[2] ma[3], qing[2] ren[2]	9.47
IX	Twists and turns	chao[3] jia[4], deng[3] dai[4], hui[2] yi[4]	8.03
I	Material base	shi[4] ye[4], gong[1] zuo[4], xue[2] xi[2], xian[4] shi[2], wei[4] lai[2], jin[1] qian[2]	7.49
VIII	Pain deriving from parting	fen[2] shou[3], shi[1] lian[4], yi[2] qing[2] bie[2] lian[4], tong[4] ku[3], shang[1] xin[1], wu[2] nai[4], yan[3] lei[4], zi[4] si[1]	7.37
III	Treat each other well	bang[1] zhu[4], gou[1] tong[1], feng[4] xian[4], guan[1] xin[1], kuan[1] rong[2], zhong[1] cheng[2], zhen[1] cheng[2], bao[1] rong[2]	7.15
II	Friendship	you[3] qing[2], peng[2] you[0]	6.65
XIV	Love-related experience(part two)	si[1] nian[4], xiang[1] si[1], gan[3] jue[2], xi[3] huan[0], ke[3] wang[4]	6.55
X	Find each other congenial	hai[3] ku[1] shi[2] lan[4], hai[3] shi[4] shan[1] meng[2], yi[1] jian[4] zhong[1] qing[2], liang[3] qing[2] xiang[1] yue[4], xin[1] xin[1] xiang[1] yin[4], xin[1] you[3] ling[2] xi[1], zhao[1] zhao[1] mu[4] mu[4]	6.37
XII	Act in concert	guang[4] jie[1], san[4] bu[4], lü[3] xing[2], dian[4] hua[4]	4.95
V	Flat	ping[2] dan[4]	4.68

Table 3. Five High-Order Clusters

High-Order Clusters	Basic Clusters	Size=number of items	Averaged AS	Summated Frequencies
Ethics and Responsibilities	IV, V, VI, VII	34	10.50	992
Romantic experience	X, XI, XII, XIII	39	8.56	928
Conflict and pain	VIII, IX	11	7.55	231
Rationality	I	6	7.49	125
Friendly care	II, III	10	7.05	196

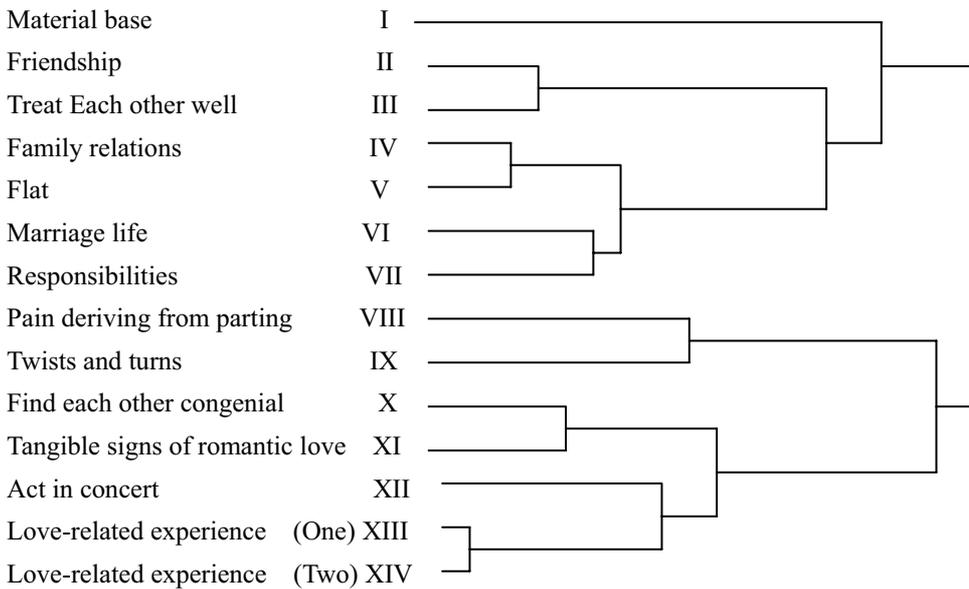


Figure 1. Dendrograms from complete-linkage analysis on the basic clusters

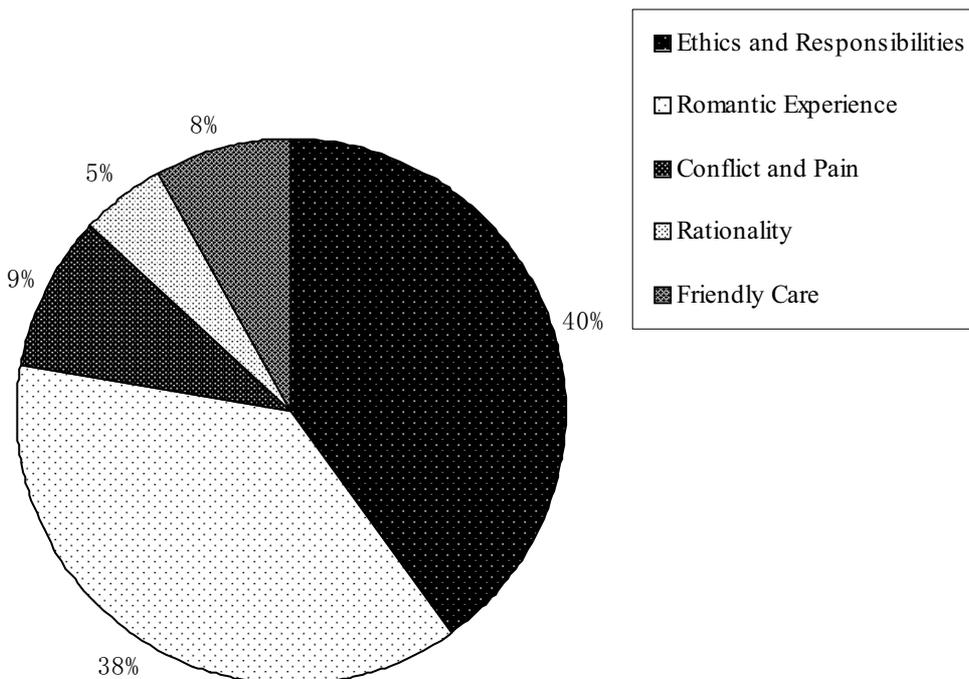


Figure 2. Proportions of the five high-order clusters