

제품 사용성과 감성에 관한 개념적 연구*

Conceptual Framework for Emotions in Usability of Products

정상훈**† · 이건표**

Sang-Hoon Jeong**† · Kun-Pyo Lee**

한국과학기술원 산업디자인학과**

Department of Industrial Design, Korea Advanced Institute of Science and Technology(KAIST)

Abstract : With the advent of computer technology, the fundamental nature of products has shaped from physical forms towards product interactivity. The focus is now on usability of the product with ease and efficiency rather than conversing with just the looks of the product. However, most definitions of usability and contemporary usability-related researches, have focused on the performance-oriented functional aspects of usability (i.e., how well users perform tasks using a product). Today, user expectations are higher; products that bring not only functional benefits but also emotional satisfaction. So far, there have been many studies on human emotions and the emotional side of products in the field of emotional engineering. Contemporary emotion-related researches have focused mainly on the relationship between product aesthetics and the emotional responses elicited by the products, but little is known about emotions elicited from using the products. The main objective of our research is analyzing user's emotional changes while using a product, to reveal the influence of usability on human emotions. In this research, we suggested conceptual framework for the study on the relationship between usability of products, and human emotions with emphasis on mobile phones. We also extracted emotional words for measuring user's emotions expressed not from looking at the product's appearance, but from using the product. First, we assembled a set of emotions that is sufficiently extensive to represent a general overview of the full repertoire of Korean emotions from the literature study. Secondly, we found emotional words in the after note by the users on the websites. Finally, verbal protocols in which the user says out loud what he/she is feeling while he/she is carrying out a task were collected. And then, the appropriateness of extracted emotional words was verified by the members of the consumer panel of a company through web survey. It is expected that emotional words extracted in this research will be used to measure user's emotional changes while using a product. Based on the conceptual framework suggested in this research, basic guidelines on interface design

* 2004 한-일감성심포지움에서 우수논문으로 선정되었음.

† 교신저자 : 정상훈(대전시 유성구 구성동 373-1 한국과학기술원)

E-mail : diasoul@kaist.ac.kr

TEL : +82-42-869-8776

FAX : +82-42-869-4510

methods that reflect user's emotions will be illustrated.

Key words : usability, user's emotions, using products, emotional words

요약 : 컴퓨터 기반 기술이 제품에 응용되어 제품의 본질이 변해감에 따라 제품의 외관보다는 제품을 쉽고 효과적으로 사용할 수 있게 하는 사용성이 제품 성공의 매우 중요한 요인이 되었다. 하지만 지금까지의 사용성에 대한 개념이나 연구들은 주로 사용자의 수행도로 직결되는 객관적인 측면만이 강조되었다. 이제 사용자들은 제품의 기능 수행도 측면뿐만 아니라 제품을 사용하면서 느끼는 감성적인 만족까지 가져다주기를 원하고 있다.

지금까지 인간의 감성에 대한 연구는 감성공학분야에서 많이 진행되었지만 기존의 감성공학관련 연구들을 살펴보면 대부분 제품의 외관과 인간의 감성에 관련된 것이 많다. 하지만 제품을 사용하면서 표출되는 인간의 감성에 관련된 연구는 아직 많이 이루어지고 있지 않는 실정이다. 이에 본 연구에서는 사용자들이 제품을 사용하면서 느끼는 감성의 변화를 조사하여 제품의 사용성이 인간의 감성에 어떤 영향을 미치는지에 대하여 밝혀 보고자 한다. 급변 연구에서는 모바일 폰을 대상으로 제품의 사용성과 인간의 감성연구를 위한 conceptual framework을 제시하였다. 또한 제품의 외관에서 느끼는 인간의 감성이 아니라 제품을 사용하는 도중에 표출되는 감성을 파악하기 위한 감성어휘를 추출하였다. 감성어휘는 다양한 문헌연구를 통한 기존의 감성어휘 조사, 웹 사이트에서 사용자들이 남긴 제품 사용후기를 통한 수집, 소리내어 생각하기(tink aloud)를 활용한 실험을 통한 수집 등의 방법을 이용하여 추출한 후 웹 서베이를 통해 적합성을 검증하였다. 본 연구를 통해 추출된 감성어휘는 제품을 사용하면서 표출되는 인간의 감성 측정자료로 활용할 수 있고, conceptual framework은 사용자의 감성을 고려한 인터페이스 개발을 위한 기본 골격을 제공할 수 있으리라 기대한다.

주제어 : 사용성, 사용자 감성, 제품 사용 중, 감성

1. Introduction

Since the application of computer technology in products, usability that concerns the ease and efficiency of use has become the key factor of success rather than its appearance [9]. However, most definitions of usability and contemporary usability-related researches are focused only on objective aspects that is directly related to the user's performance (i.e., how well the users perform tasks while using a product). Nowadays, people look for something more: products that bring not only functional benefits but also emotional satisfaction.

Although there have been many studies on human emotions from the field of emotional

engineering, most were about product appearance and the human emotion in relation to it. The researches on emotion and product usability merely show that human emotion affects product usability. In relation, Norman [8] claimed that negative emotions can make a simple task difficult, and that positive emotions can make a difficult task easier. However, little is known about emotions elicited by using the products and how the usability of products has effects on human emotions. Does good usability of products elicit positive emotions?

On the other hand, does bad usability of products elicit negative emotions? These questions have not been clearly answered yet. The main goal of this study is to reveal the influence of

usability on human emotions by analyzing the user's emotional changes while using a product.

Before proceeding into the research, we suggested a conceptual framework for the study on the relationship between usability of products and human emotions with emphasis on mobile phones. We also extracted emotional words to measure the user's emotion that is expressed, not from the product's appearance, but from the product's use.

2. Research methodology

For a successful outcome, the research is composed of literature study and experimentation. First, through literature study, research on the following contents should be performed. (See Figure 1)

- Understand the concepts of usability from studies on its definitions and attributes.
- Benchmark various usability evaluation methods.
- Suggest the most effective method to measure usability of products.
- Understand the concept of user's emotions from studies on the definitions and attributes of emotions.
- Benchmark various measuring methods to measure user's emotion.
- Suggest the most effective method to measure user's emotions expressed while using a product.

The following aspects will be extracted and verified through experimentation,

- Comprehend the various types of user's

emotions elicited while using a product.

- Measure the changes of user's emotions elicited while using a product.

Based on the result of this study, we can discover the relationship between product usability and the user's emotions. Furthermore, we hope to suggest basic interface design guidelines that reflect the users' emotions.

Study 1 : Extracting Korean emotional words elicited from the use of products

Using the words collected from previous research results and other various methods, we aim to extract emotional words expressed while using a product through web surveys, and extract main emotions expressed while using a product after clustering through factor analysis.

Study 2 : Benchmarking usability testing methods and human emotion measuring methods

Through various literature studies, select the most reliable method that can be used to make quantitative analysis of product usability, and the most appropriate method to measure emotions while using a product.

Study 3 : Measuring users' emotional changes while using a product

We aim to measure the change in emotions expressed by approximately 30 participants while they perform several given tasks using mobile phones. 2 tasks that do not have any usability problems and 2 tasks that do have serious usability problems will be performed to measure

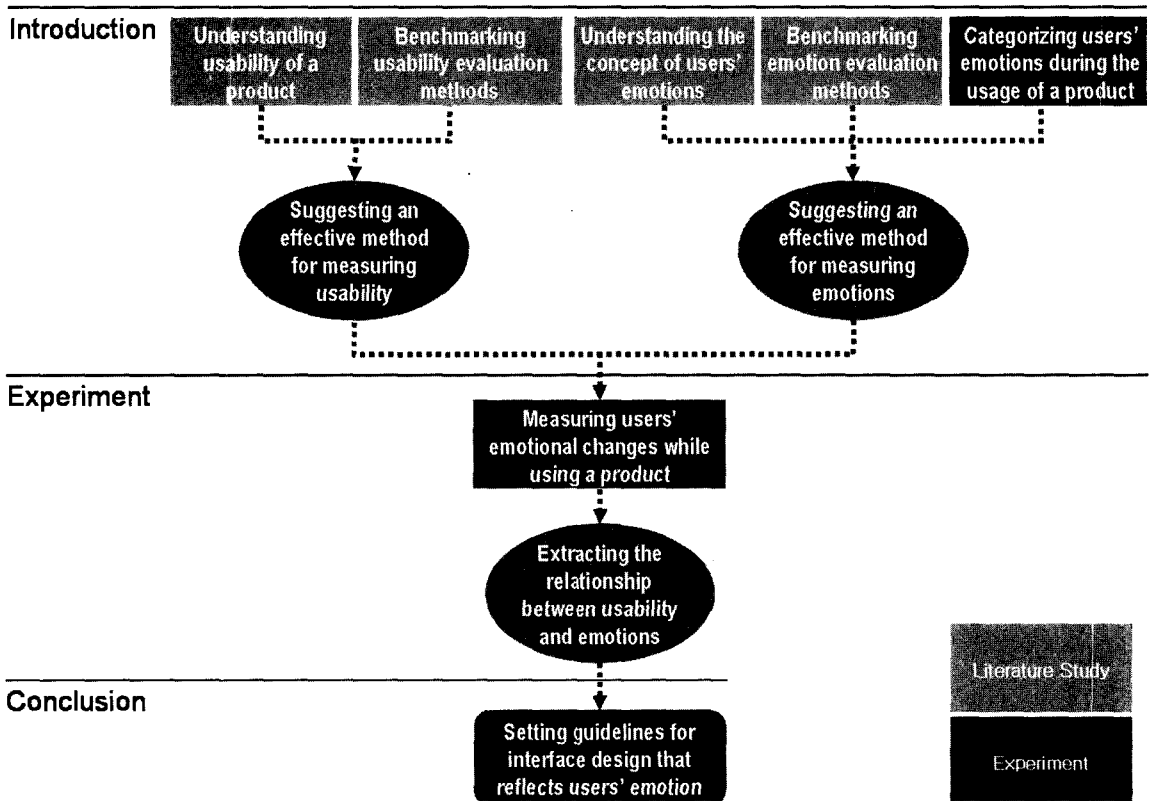


Figure 1. Research methodology

emotional changes in relation to the difficulty of the task. After each task, a subjective evaluation on the emotional changes expressed by the user is to be performed by the user him/herself using the emotional words extracted from study 1. Lastly, we aim to evaluate the satisfaction rate of the product's usability and compare it with the actual experiment results.

Due to their subjective and personal qualities, emotions are difficult to define and measure. Typically, there are two main human-emotion-measuring methods: psychological evaluation and physiological evaluation. The parameters in physiological evaluations that appear from autonomic nerve system are blood pressure, electrocardiogram (ECG), pulse, skin temperature,

and one of the parameters that appear from the central nerve system is electroencephalogram (EEG). Out of these, EEG is often used for studying emotions because it contains the most information on brain activities [1].

Therefore we aim to measure the emotional changes by detecting the users' EEG while they perform tasks concerning several aspects, such as pleasantness-unpleasantness, excitement-relaxation, tension-release. This is based on the theory of Wilhelm Wundt who systematically studied the human emotion after establishing the Psychologisches Laboratorium at Leipzig in 1879. Wundt [10] saw the human emotion as a combined system of three dimensions, which are pleasantness-unpleasantness, excitement-relaxation, tension-

release. This can be seen as a classic of human emotion studies. Also, accurate data of the users' emotional change can be measured by examining various physiological signs, such as electrocardiogram, electrodermal activity or galvanic skin response, electromyogram, blood pressure, pulse, FPG, and eye blinking.

The following issues will be analyzed through this experiment.

- Analyze the relationship between task duration and emotions.
- Analyze the relationship between errors and emotions.
- Analyze the relationship between satisfaction and emotions.
- Analyze the relationship between facial expression and emotions.

Study 4 : Comparing users' emotions before and after the improvement of usability

After correcting the problems and improving the usability of the mobile phone used during study 3, we aim to measure the emotional changes by using the same methods as study 3 while performing identical tasks. From this experiment, difference in emotion between before and after the improvement of usability can be compared.

The following issues will be analyzed through this experiment.

- Compare performance time before and after the improvement of interface
- Compare the emotions before and after the improvement of interface
- Compare the emotions for the two tasks without problems

- Compare the emotions for the two tasks which had problems and thus were modified

3. Extraction of emotional words

In the field of emotional engineering, a measurement method that indirectly measures the user's emotions through adjectives, called emotional words, is used. However, most of the studies on emotional words are related to expressions of emotions felt from a product's appearance or studies on words that emotionally express a product's appearance itself. In relation, we have extracted some emotional words that can come up while people use a product and reveal emotional changes.

First, we assembled a set of emotions that were sufficiently extensive to represent a general overview of the full repertoire of Korean emotions from various literature studies. Secondly, we found emotional words from the after notes written by website. Lastly, emotional words were collected from verbal protocols in which the user says out loud what he/she is feeling while he/she is carrying out a task. (See Figure 2) After the collected words were deleted or integrated

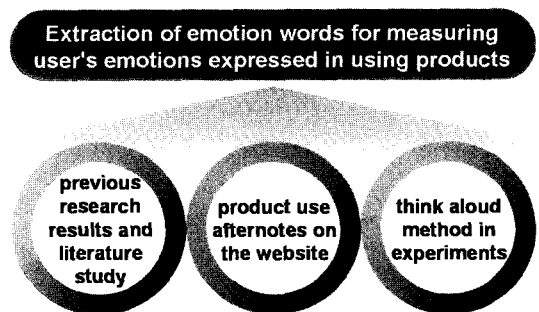


Figure 2. Extraction of emotional word

according to standards, they were applied on appropriateness evaluation surveys for identification of emotional expressions while using a product.

3.1. Extractions from previous research results and literature study

Researches on emotional words have been carried out actively in the fields of psychology, linguistics, emotional engineering, and etc. The following are some of the major research results.

Kim et al. [2] analyzed the human inner system in the form of 'pleasant/unpleasant' through emotion related word analysis. Through free associations, 83 human inner system words were selected from emotion related words that were frequently used when expressing experience, and were analyzed through dimensional evaluation. Kim [4] organized the linguistic characteristics of Korean emotional expressions through an overall examination on the characteristics of body language, and on the concept and category of emotion revealed from idioms. Idiom cases related to 'joy/happiness, sadness, anger, fear, love, and disgust/hate' were studied to examine the core meanings of each emotion. Jang and Jang [6] categorized idioms of Korean emotion expressions into ones that reveal emotional experiences concerning the production, extinction, and continuation of emotions, and one that reveal emotion expression behaviors. 220 emotional idioms were suggested to set the category of emotions. Park et al. [5] analyzed the overall meaning structure of Korean adjectives by using the semantic differential method. After 46 representative nouns that fall under Korean

category criterion were suggested, the associated adjectives and Yonsei university Korean dictionary editors used the Korean vocabulary frequency list to collect adjectives. 115 frequently used adjectives in relation to various concepts were extracted and a group of graduate students majoring psychology extracted 40 set of main opposite word sets in Korean adjectives. Kim et al. [3] collected adjective words that were used to express products. Applicable adjective were collected from the Korean dictionary and 265 emotional words were extracted through appropriateness evaluation survey of understanding human emotions. Out of the adjectives extracted, 40 main words excluding opposite words and similar words were organized. The 40 emotional words evaluated by scaling method were categorized into attractiveness, luxury, comfort, openness, pleasantness, intimate, and feel of use through factor analysis. Han et al. [7] used existing research results, reference literature, association methods on product advertisements, observations on a product's interface factor groups to extract 1,700 emotional words that are related to human emotions. These words were filtered according to overlapping meanings and elimination standards to come up with 163 final emotional words.

In our research, we collected 182 words by relating to these existing research results and literature studies. (See Appendix 1) Psychological research result on emotional words by Kim et al. [2] was set as the basis and other researches were added on to it. Words that clearly did not induce from the use of the product and that were induced simply from the appearance of a product was eliminated. Also, words that were derived

from one word and words of similar concepts were combined in to one word group.

3.2. Extractions from product use afternotes on the website

From the afternotes, we can indirectly understand the psychological state, reactions, and opinions of users while they used the product. With the internet, we can access large numbers of afternots from various websites. In this research, we used websites that are used by many users, such as shopping mall and mania sites, to extract emotional words from their afternotes.

– Shopping mall sites : 6 sites

- ① Daum shopping
(<http://dnshop.daum.net/>)
- ② INTERPARK
(<http://www.interpark.com/malls/>)
- ③ Auction
(<http://www.auction.co.kr/>)
- ④ Cjmall
(http://www.cjmall.com/index_tab1.jsp)
- ⑤ Buynjoy
(<http://www.buynjoy.com/>)
- ⑥ Hansol CS Club
(<http://www.csclub.com/>)

– Mania sites : 5sites

- ① Cetizen.com
(<http://www.cetizen.com/>)
- ② dcinside
(<http://www.dcinside.com/>)
- ③ nbinside
(<http://nbinside.com/>)
- ④ ClieN
(<http://www.clieN.net/>)

⑤ K'-BENCH

(<http://www.kbench.com/>)

A total of 247 emotional words were collected from 11 websites on mobile phones, camera/digital cameras, home appliances, electronic pocket books, computer peripherals, and softwares. (See Appendix 2) The emotional words collected from each websites were eliminated and combined according to overlaps and similarities.

3.3. Extractions from Think Aloud method in experiments

The two methods above are indirect methods of extracting emotional words. Think Aloud methods was applied as a direct method to collect emotional changes expressed by users while they used a product. Users were asked to perform a set of tasks using a mobile phone (J-PHONE) and verbally express their emotion during use. The participant users were 8 graduate students (4 males, 4 females) who have never used the experimented mobile phone (See Figure 3).

It took an average of 20 minutes for the 8 participants to perform 5 tasks, and a total of 85 emotional words, including overlapping words, were extracted. A total of 53 emotional words were collected after the elimination of overlapping words. (See Appendix 3) From debriefs after the experiment, we found that the Think Aloud method was not easy because the users concentrated on performing the given tasks due to the pressure of having to complete the tasks.

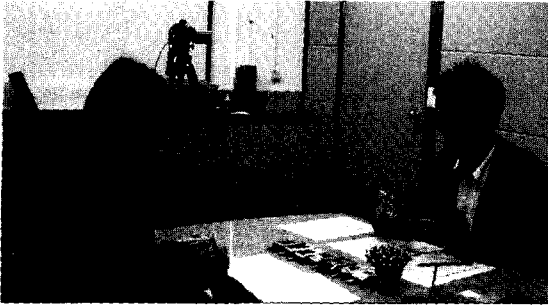


Figure 3. Extractions from Think Aloud method in experiments

3.4. Assortment results of emotional words that are expressed during product use

In this research, a total of 482 emotional words were collected from the following methods: 182 words from existing research results, 247 words from users' afternotes on websites, and 53 words from the Think Aloud method. After eliminating words with overlapping concepts, 363 words were used in appropriateness evaluation surveys to understand the emotions that can be expressed while using a product. (See Appendix 4)

Through the first appropriateness evaluation survey on graduate students who study user interface and workers in the field of interface related work, we eliminated words that did not clearly relate to the use of a product, words that were derived simply from the product's appearance, and words that were not clearly understandable. A total of 34 users participated in the web survey. 18 users were male and 16 users were female. 18 users were in their 20s, 14 users were in their 30s, and 2 users did not mention their age.

From the survey, there were 39 words that none of the 34 participants chose, such as frustrated, disappointed, satisfied, delighted, and

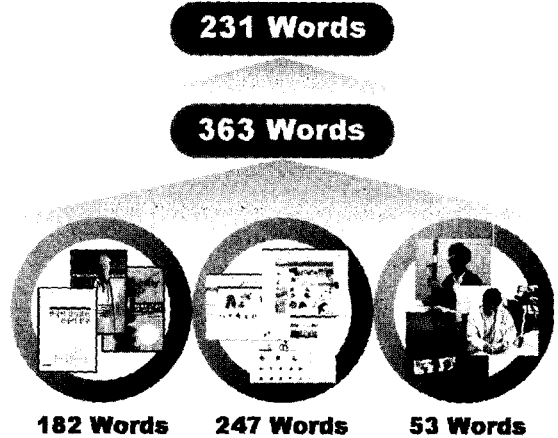


Figure 4. Extracted emotional words

etc. By analogy, these words can be understood as appropriate words to express the emotions felt while using a product. In this survey, based on the average word selection frequency (average 3.887, standard deviation 4.219), the words that were selected by over 4 users were firstly eliminated. According to this, 231 emotional words were finally chosen out of the 363 words that were surveyed. (See Figure 4 and Appendix 5)

4. Conclusion & Expected outcomes

In this research, the research matter and methods to be progressed were organized by presenting the conceptual framework for the study of product usability and human emotion research. Also, we extracted the emotional words that are expressed from the use of a product and not its appearance. The finalized words that were collected from this research will be used in the 2nd set of appropriateness evaluation to extract emotional words that are even more suitable. The emotional words extracted from these evaluations will be used as subjective evaluation

data that is required to measure human emotion. The following are several anticipated results of future researches based on the conceptual framework presented in this research.

Expected Outcomes are;

- Suggesting effective methods of measuring usability
- Categorizing user's emotions revealed during use of a product
- Providing effective methods of measuring user's emotions
- Measuring emotional changes that users undergo during use of a product
- Extracting the relationship between usability and emotions
- Setting guidelines for interface design that reflect users' emotion

Through continuous studies based on these researches, we hope to supply a basic framework for the development of interface with consideration to the user's emotion.

References

- [1] Kim, D. J., Kang, D. K., Kim, H. H., Yi, S. H., Ko, H. W. & Park, S. J. (2002). A study on the human sensibility evaluation technique using EEGs of 4 emotions, *Trans. KIEE*, 51D(11), 528-534.
- [2] Kim, Y. A., Kim, J. K., Park, S. K., Oh, K. J. & Chung, C. S. (1998). Dimension of the Emotion Structure through the Analyses of Emotion related terms in Korean Language, *Korean Journal of the Science of Emotion & Sensibility*, 1(1), 145-152.
- [3] Kim, C. J., Lee, N. S., Park, S. J., Park, J. H., Park, S. C., Lee, S. Y., Kwon, K. S., Park, K. S. & Jung, K. T. (1993). Development of human sensibility measurement technology, The 1th year report, Korea Research Institute of Standards and Science(KRISS), Ministry of Science and Technology, 8-20.
- [4] Kim, H. S. (2003). A study on Korean emotional idioms, Hankookmunhwasa, Seoul.
- [5] Park, M. C., Shin, S. G., Han, K. H. & Whang, S. M. (1998). Measuring meaning of Korean adjectives and colors, *Korean Journal of the Science of Emotion & Sensibility*, 1(2), 1-11.
- [6] Jang, S. K. & Jang, K. H. (1994). A study on Korean idioms - with emphasis on emotion expressions, *Journal of Koreanology* (Institute for Koreanology, Hanyang University), 25, 295-318.
- [7] Han, S. H., Yoon, M. H., Kim, K. J., Jo, S. J., et al. (1998). Development of a Usability Evaluation Method, Pohang University of Science and Technology (POSTECH), Ministry of Science and Technology, 9-48.
- [8] Norman, D. (2002). *Emotion and Design, Interaction*, IX, 4, 36-42.
- [9] Shackel, B. (1991). Usability-Context, Framework, Design, and Evaluation, In: B. Shackel & S. Richardson (Eds.), *Human Factors for Informatics Usability*, Cambridge University Press, Cambridge.
- [10] Wundt, W. (1874). *Grundzuge der physiologischen Psychologie*, Continuum Intl Pub Group, Leipzig.

Appendix

Appendix 1. Extractions from previous research results and literature study : 182 words

속상함, 피로움, 미워함, 짜증남, 싫어함, 분노, 억울함, 불안, 경멸, 절망, 근심, 초조, 불쾌함, 후회, 당황, 안타까움, 두려움, 미치겠음, 놀라움, 슬픔, 실망, 간절함, 질투, 한스러움, 부끄러움, 긴장, 꺼림칙함, 혼란함, 귀찮음, 암담함, 울고 싶음, 만족스러움, 서러움, 울적함, 답답함, 우울함, 심란함, 미안함, 이상함, 행복, 부러움, 자신감, 고마움, 착잡함, 사랑, 시원함, 나른함, 뿌듯함, 졸리움, 포근함, 흐릿함, 안정감, 반가움, 흥가분함, 상쾌함, 우스움, 심심함, 명함, 자랑스러움, 편안함, 지겨움, 지루함, 즐거움, 좋아함, 공허함, 허탈함, 피곤함, 기분 좋음, 흥겨움, 기쁨, 희망, 흥분, 무거움, 흥미로움, 활기참, 감동적임, 그리움, 쓸쓸함, 황홀함, 들뜸, 조바심, 놀람, 어이없음, 충격, 화, 격분, 성가심, 증오, 언짢음, 아니꼬움, 원한, 가책, 관심, 의욕, 욕심, 신명남, 고통, 공포, 수줍음, 창피, 죄책감, 애정, 미움, 무서운, 재미있는, 아름다운, 따듯한, 재미없는, 힘든, 화려한, 빠른, 멋있는, 친근한, 짜증나는, 조용한, 시끄러운, 끔찍한, 간단한, 단순한, 불편한, 불행한, 쉬운, 심각한, 어려운, 완벽한, 우수함, 적절한, 진지한, 훌륭한, 특별한, 평범한, 수수함, 느린, 촌스러운, 낯선, 추한, 복잡한, 참신한, 독특한, 신선한, 생생한, 호감 있는, 친숙한, 실용적인, 갖고 싶은, 거추장스러운, 견고한, 괜찮은, 굉장한, 기발한, 까다로운, 깔끔한, 꼼꼼한, 조화감, 단조로운, 마음에 드는, 사고 싶은, 생동감 있는, 생소한, 어설픈, 어수선한, 위압감, 조잡한, 통일성 있어 보이는, 혁신적인, 보수적인, 호기심을 자극하는, 귀여운, 균형 있는, 무난한, 맛맛한, 믿음직한, 뻑뻑한, 뻑뻑한, 섬세한, 아늑한, 안락한, 앙증맞은, 요란스러운, 유치한, 정교한, 정돈되어 있는, 취향에 맞는, 아기자기한, 튼튼한

Appendix 2. Extractions from product use afternotes on the website : 247 words

불편한, 힘든, 예쁜, 짜증나는, 열 받는, 찝찝한, 좋은, 집어던지고 싶은, 만족스러운, 신기한, 특이한, 아기자기한, 고급스러운, 멋진, 통일감 있는, 재미 있는, 매력 있는, 속은 듯한, 괜찮은, 불안정해 보이는, 어이가 없는, 깨끗한, 묵직한, 세련된, 완벽한, 한눈에 반한, 가벼운, 튼튼한, 감탄한, 황당한, 지저분한, 아쉬운, 편리한, 적당한, 특징이 없는, 수궁할 수 없는, 성의 없는, 충분한, 땡땡한, 잘빠진, 형편 없는, 투박한, 눈을 확 사로잡는, 정말 깨는, 뻑뻑한, 답답한, 우수한, 그저 그런, 컴팩트한, 귀여운, 실망스러운, 독특한, 뿌듯한, 익숙하지 않은, 허접한, 어려운, 뻑뻑한, 렉서리한, 시원한, 죽여주는, 훌륭한, 참을 만한, 화려한, 기대에 부합하는, 개성 있는, 눈길을 끄는, 명쾌한, 맘에 들지 않는, 어안이 병병한, 당황스러운, 불필요한, 한심한, 최악의, 혼란스러운, 아담한, 감쪽한, 부실한, 적나라한, 상상을 초월하는, 뛰어난, 후질근한, 별로인, 평범한, 기쁘, 나쁜, 귀찮은, 화난, 신뢰할 만한, 불안한, 거북스러운, 깔끔한, 민망한, 친절함, 신중한, 무난한, 이상한, 너무 심한, 속상한, 신선한, 엉망인, 허술한, 불쾌한, 산뜻한, 상쾌한, 꼼꼼한, 세심한, 즐거운, 아름다운, 섭섭한, 행복한, 빠른, 놀라운, 흡족한, 자연스러운, 촌스러운, 어울리는, 곤란한, 확실한, 실용적인, 효율적인, 유용한, 칙칙한, 감동한, 부담 없는, 싫은, 편안한, 쉼렁한, 쉬운, 단정한, 새로운, 예민한, 무리 없는, 어색한, 튀는, 심플한, 느린, 애매한, 편한, 쓸만한, 씹박한, 부족한, 최고인, 부드러운, 결끄러운, 지겨운, 너무 구린, 어처구니 없는, 기분 나쁜, 고민되는, 지친, 환장할 것 같은, 헛갈리는, 알찬, 난감한, 대단한, 인상적인, 흐릿한, 짙은, 추한, 무거운, 지루한, 신경 쓰이는, 꺼림칙한, 질린, 용이한, 넉넉한, 다양한, 알맞은, 적합한, 생생한, 복잡한, 단순한, 영성함, 살아 있는, 실감나는, 맛맛한, 돋보이는, 탁월한, 간단한, 즐겁기 만한,

적절한, 최상의, 약해보이는, 양증맞은, 강력한, 간편한, 후회 없는, 부담스러운, 풍부한, 필요한, 개운한, 자갈한, 버거운, 근사한, 감각적인, 비슷비슷한, 심심한, 충동적인, 웃기는, 생소한, 시원찮은, 요란한, 우울한, 찜찜한, 살벌한, 걱정스러운, 허전한, 흥한, 조잡한, 심각한, 흥분한, 경쾌한, 굉장한, 마음상한, 미칠 듯한, 까마득한, 억울한, 재수 없는, 완전한, 무서운, 갑갑한, 너무한, 참신한, 불만인, 슬픈, 예쁘지 않은, 싫증나는, 안심이 되는, 감격스런, 어지러운, 서운한, 의심스러운, 나쁘지 않은, 믿음직스러운, 안타까운, 잘된, 민감한, 신통찮은, 화사한, 거친, 쓸쓸한, 정교한, 객관적인, 들뜨, 샤프한, 발랄한, 최강인

Appendix 3. Extractions from Think Aloud method in experiments : 53 words

정신없는, 난감한, 어려운, 특이한, 너무 구린, 이상한, 신기한, 귀찮은, 힘든, 답답한, 장난 아닌, 좋은, 독특한, 헛갈리는, 죽을 지경인, 알 수 없는, 뿌듯한, 통쾌한, 대단한, 불편한, 짜증나는, 복잡한, 화려한, 당황스러운, 불안한, 괜찮은, 바보 된 듯한, 행복한, 심각한, 너무 심한, 부끄러운, 창피한, 만족스러운, 신나는, 막막한, 깔끔한, 혼란스러운, 새로운, 골 때리는, 기쁜, 재미있는, 익숙한, 자신 있는, 쉬운, 기분 나쁜, 친절한, 예쁜, 귀여운, 맘에 안 드는, 부담스러운, 편한, 이해할 수 없는, 어지러운

Appendix 4. Assortment results of emotional words that are expressed during product use : 363 words

속상함, 피로움, 미워함, 짜증남, 싫어함, 분노, 억울함, 불안, 경멸, 절망, 근심, 초조, 불쾌함, 후회, 당황, 안타까움, 두려움, 미치겠음, 놀라움, 슬픔, 실망, 간절함, 질투, 한스러움, 부끄러움, 긴장, 꺼림칙함, 혼란함, 귀찮음, 암담함, 울고 싶음, 만족스러움, 서러움, 울적함, 답답함, 우울함, 심란함, 미안함, 이상함, 행복, 부러움, 자신감, 고마움, 착잡함, 사랑, 시원함, 나른함, 뿌듯함, 즐리움, 포근함,

흐뭇함, 안정감, 반가움, 홀가분함, 상쾌함, 우스움, 심심함, 멍함, 자랑스러움, 편안함, 지겨움, 지루함, 즐거움, 좋아함, 공허함, 허탈함, 피곤함, 기분 좋음, 흥겨움, 기쁨, 희망, 흥분, 무거움, 흥미로움, 활기참, 감동적임, 그리움, 쓸쓸함, 황홀함, 들뜨, 외로움, 조바심, 어이없음, 충격, 화, 격분, 성가심, 증오, 언짢음, 아니꼬움, 원한, 가책, 관심, 의욕, 욕심, 신명남, 고통, 공포, 수줍음, 창피, 죄책감, 애정, 무서운, 재미있는, 아름다운, 따듯한, 재미없는, 힘든, 화려한, 빠른, 멋있는, 친근한, 조용한, 시끄러운, 끔찍한, 간단한, 단순한, 불편한, 불행한, 쉬운, 심각한, 어려운, 완벽한, 우수한, 적절한, 진지한, 훌륭한, 특별한, 평범한, 수수한, 느린, 촌스러운, 낯선, 추한, 복잡한, 참신한, 독특한, 신선한, 생생한, 호감 있는

친숙한, 실용적인, 갖고 싶은, 거추장스러운, 견고한, 괜찮은, 굉장한, 기발한, 까다로운, 깔끔한, 꼼꼼한, 조화감, 단조로운, 마음에 드는, 생동감 있는, 생소한, 어설피, 어수선한, 위압감, 조잡한, 통일성 있어 보이는, 혁신적인, 보수적인, 호기심을 자극하는, 귀여운, 균형 있는, 무난한, 미미한, 믿음직한, 뻑뻑한, 뻑뻑한, 섬세한, 아늑한, 안락한, 양증맞은, 요란스러운, 유치한, 정교한, 정돈되어 있는, 취향에 맞는, 아기자기한, 튼튼한, 예쁜, 열 받는, 찜찜한, 좋은, 집어 던지고 싶은, 신기한, 특이한, 어울리는, 고급스러운, 매력 있는, 속은 듯한, 불안정해 보이는, 어이가 없는, 깨끗한, 묵직한, 세련된, 완벽한, 한눈에 반한, 가벼운, 감탄한, 황당한, 지저분한, 아쉬운, 편리한, 적당한, 무리 없는, 의심스러운, 특징이 없는, 수궁할 수 없는, 성의 없는, 충분한, 뻥뻥한, 잘빠진, 형편없는, 투박한, 눈을 확 사로잡는, 정말 깨는, 뻑뻑한, 그저 그런, 컴팩트한, 익숙하지 않은, 허접한, 렉서리한, 죽여주는, 참을 만한, 기대에 부합하는, 개성 있는, 눈길을 끄는, 명쾌한, 맘에 들지 않는, 어안이 병병한, 불필요한, 한심한, 최악의, 아담한, 감쪽한, 부실한, 적나라한, 상상을 초월하는, 뛰어난, 후질근한, 별로

인, 나쁜, 신뢰할만한, 거북스러운, 민망한, 친절하
 신중하, 너무 심하, 엉망인, 허술하, 산뜻하, 세심
 하, 섬세하, 흡족하, 자연스러운, 곤란하, 확실하,
 효율적인, 유용하, 칙칙하, 부담 없는, 썰렁하, 단정
 하, 새로운, 예민하, 어색하, 튀는, 심플하, 애매하,
 편하, 쓸만하, 씹박하, 부족하, 최고인, 부드러운,
 곱끄러우, 너무 구린, 어처구니없는, 기분 나쁘, 고
 민되는, 지친, 환장할거 같은, 헛갈리는, 알찬, 난감
 하, 대단하, 인상적인, 짱인, 신경 쓰이는, 질린, 용
 이하, 넉넉하, 다양한, 알맞은, 적합하, 영성하, 살
 아 있는, 실감나는, 돋보이는, 탁월하, 즐길만한, 최
 상의, 약해 보이는

강력하, 간편하, 후회 없는, 부담스러운, 풍부하,
 필요하, 개운하, 자잘하, 버거운, 근사하, 감각적인,
 비슷비슷하, 충동적인, 웃기는, 시원찮은, 찝찝하,
 살벌하, 걱정스러운, 허전하, 흥한, 경쾌하, 마음상
 하, 미칠 듯한, 까마득하, 재수 없는, 완전하, 갑갑
 하, 너무하, 불만인, 예쁘지 않은, 싫증나는, 안심이
 되는, 감격스런, 어지러운

서운하, 나쁘지 않은, 잘된, 민감하, 신통찮은, 화
 사하, 거친, 객관적인, 들뜬, 샤프하, 발랄하

최강인, 정신없는, 장난 아닌, 죽을 지경인, 알 수
 없는, 통쾌하, 바보 된 듯한, 신나는, 막막하, 골 때
 리는, 익숙하, 이해할 수 없는

Appendix 5. Extracted emotional words : 231 words

짜증남, 실망, 만족스러움, 즐거움, 좋아함, 피곤함,
 성가심, 재미없는, 친근하, 불편하, 친숙하, 괜찮은,
 마음에 드는, 어설피, 믿음직하, 요란스러운, 정교
 하, 고급스러운, 불안정해 보이는, 묵직한, 아쉬운,
 컴팩트하, 익숙하지 않은, 렉서리한, 눈길을 끄는,
 아담하, 세심하, 자연스러운, 확실하, 심플하, 편하,
 부드러운, 대단하, 알맞은, 적합하, 약해보이는, 근
 사하, 시원찮은, 싫증나는, 분노, 당황, 놀라움, 혼
 란함, 귀찮음, 답답함, 이상함, 뿌듯함, 흐뭇함, 편
 안함, 지겨움, 지루함, 기분 좋음, 조바심, 화, 재미
 있는, 시끄러우, 어려운, 평범하, 복잡하, 참신하,

신선하, 깔끔하, 단조로운, 생소하, 어수선하, 조잡
 하, 호기심을 자극하는, 섬세하, 아늑하, 앙증맞은,
 유치하, 취향에 맞는, 예쁜, 좋은, 신기한, 특이하,
 어울리는, 깨끗하, 세련된, 완벽하, 가벼우, 지저분
 하, 적당하, 특징이 없는, 형편없는, 투박하, 눈을
 확 사로잡는, 그저 그런, 허접하, 기대에 부합하는,
 개성 있는, 맘에 들지 않는, 최악의, 신뢰할 만하,
 엉망인, 산뜻하, 흡족하, 부담 없는, 단정하, 새로
 우, 예민하, 어색하, 튀는, 애매하, 쓸만하, 부족하,
 최고인, 인상적인, 영성하, 돋보이는, 탁월하, 간편
 하, 웃기는, 완전하, 예쁘지 않은, 나쁘지 않은, 신통
 찮은, 화사하, 알 수 없는, 신나는, 막막하, 익숙
 하, 괴로움, 싫어함, 불안, 불쾌함, 후회, 미치겠음,
 간절함, 안정감, 기쁨, 흥분, 흥미로움, 들뜸, 충격,
 아름다운, 화려하, 멋있는, 간단한, 단순하, 적절하,
 특별하, 느린, 촌스러운, 낯선, 독특한, 호감 있는,
 갖고 싶은, 거추장스러운, 기발하, 조화감, 귀여우,
 균형 있는, 무난하, 밋밋하, 안락하, 정돈되어 있는,
 아기자기하, 튼튼하, 열 받는, 매력 있는, 편리하,
 무리 없는, 충분한, 잘빠진, 불필요하, 감쪽하, 뛰어난,
 거북스러운, 씹박하, 기분 나쁘, 헛갈리는, 용이
 하, 다양한, 실감나는, 즐길만한, 최상의, 강력하,
 부담스러운, 풍부하, 필요하, 감각적인, 비슷비슷
 하, 허전하, 경쾌하, 불만인, 어지러운, 잘 된, 민감
 하, 샤프하, 정신없는, 통쾌하, 속상함, 초조, 두려
 움, 긴장, 자신감, 상쾌함, 어이없음, 언짢음, 관심,
 힘든, 빠른, 조용하, 쉬운, 우수하, 훌륭한, 굉장하,
 통일성 있어 보이는, 집어 던지고 싶은, 속은 듯한,
 감탄하, 황당하, 참을만하, 명쾌하, 별로인, 나쁘,
 허술하, 효율적인, 유용하, 칙칙하, 어처구니없는,
 난감하, 신경 쓰이는, 넉넉하, 후회 없는, 자잘하,
 흥한, 너무하, 안심이 되는, 거친

원고접수 : 2004. 10. 27.

수정접수 : 2005. 3. 6.

게재확정 : 2005. 3. 8.