國立交通大學
應用藝術研究所

碩士論文

探測使用者的負面情緒經驗—以搭乘公車為例
Probing the negative emotion of user experience from taking bus

研 究 生：陳佳志

指導教授：鄧怡莘 教授

中 華 民 國 九 十 九 年 二 月

探測使用者的負面情緒經驗—以搭乘公車為例

Probing the negative emotion of user experience from taking bus

研 究 生：陳佳志 　　　Student：Chia-Chih Chen

指導教授：鄧怡莘 　　　Advisor：Yi-Shin Deng

國立交通大學

應用藝術研究所

碩士論文

A Thesis

Submitted to Institute of Applied Arts

College of Humanities and Social Science

National Chiao Tung University

in partial Fulfillment of the Requirements

for the Degree of

Master

in

Art in Design

Feb 2010

Hsinchu, Taiwan

中華民國 九十九 年 二 月

致　謝

　　首先，很感謝百忙中抽空的口試老師：莊老師、小馬老師和指導老師鄧老師，謝謝你們的寶貴意見和給予肯定。我很喜歡莊老師的親和力和嚴謹的研究態度，還有小馬老師總是可以用很幽默風趣又讓人感到貼心的方式給予學生建議，以及鄧老師的苦口婆心和細心叮嚀(我想鄧老語錄不是浪得虛名!)，除了在論文上的幫助外，我真的受益良多。

　　也很謝謝我的指導老師 鄧怡莘老師，從進研究所以來就可以感受到老師的深不可測，因為什麼都可以談，做研究、談設計、聊八卦、談感情、講未來、問這季日劇哪一部好看...在老師的指導之下，過得很開心也很自在，因為就好像朋友般的師徒關係。雖然這個朋友有時挺嚴格的，但我知道他是為我好，想到這點就啾甘心啊!(哈)當然，鄧老師有著做研究的嚴謹態度、靈活的思維和敏銳的判斷力，加上隨時不斷自我要求更新的那種態度更是令人敬佩，在我心中一直是個優質學者的楷模。

　　回想研究所生活及寫論文的過程，認識了各式各樣的奇人異士，也得到了好多的貴人相助，不管是間接還是直接的，你(妳)們都幫助我順利完成人生中這一個重要的歷程。要感謝的人太多，以下簡單介紹：總是可以把每件事弄得超好玩的炫劭(破壞行情的根本是你啊!)、超強手繪神手的千慧(百無禁忌，真的是甚麼都畫!)、人生導師外加見過大風大浪的阿福課長(如果沒有與你的對談，可能我一直走錯路!)、IF 得獎王的不在嘉(我都會跟我朋友炫耀你耶!)、大姐頭陳佩(我知道你的內心和外表其實差異懸殊)、常讓研究室有時充滿特別氣氛的英文高手吐司貓佳欣、傻大姐個性的粘 BB(到現在還是猜不透妳啊!哈!)、簡報王加細心王的雨虹大大、甚麼都知道甚麼都厲害的翁神、拍過廣告又趕過通告的風鈴(很謝謝妳之前的托福口語衝刺班)、口試大猜題和論文工作坊的固定班底科虎(每天早上一起去吃早餐感覺真不賴啊!)、熱心出借研究室位子的菁妏、酷酷的但總是語出驚人的科克(同時也是很妙的室友，我很懷念大家躺在自己床上聊天到天亮的日子!)、擁有一般女生沒有的知識又賢慧的瑞大、外表溫柔婉約的小孟(但我知道妳和瑞大是同一掛的!)、會給予怪異關心和維他命 B 群的歐佩(哈!)、同一條船上互相打氣的采芳、國科會曾一起努力的鈺喬、根本不像學長的鵬鵬和帥哥士堯(你們幫忙跑問卷真的大感謝!)...以及所上學弟妹們的打氣和所有老師的相挺，加上所有接受我訪談和填問卷的熱心朋友們，真的有太多人要感謝，也很高興能夠擁有這麼棒的研究所回憶。

　　最後，最感謝家裡的老爸、老媽這麼辛苦地支持我的學業、每天會陪我玩和鬧我的姐姐、一直說我論文還要再半年卻還是幫我看論文的老哥、傳說中林同學對我那破英文的拯救、總是乖乖地陪著我一同努力的佳蓓、在芬蘭交換學生時所遇到的心靈導師宜達建文夫婦、一起在芬蘭努力做 project 的陳佩跟吳苑、在芬蘭開啟我 fashion 視野的泡泡...多虧你(妳)們的幫助及陪伴，我才有這麼多采多姿的生活及回憶。

<div align="right">By 陳佳志 2010.March</div>

中文摘要

從 19 世紀開始就是工業量產的時代，如今，大部份的社會轉變為以服務為主的模式，從以往購買一個產品到購買一段經驗的消費模式。在這資料爆炸的時代之下，這些支撐社會的服務以有形或是無形的方式透過實質的物、溝通交流、環境資訊及行為而存在著。且服務的設計也連結了文化的、社交的和人類間的互動，目的是提供人們更美好的生活經驗。近 10 年來使用者的生活經驗和情緒開始被重視，由於情緒在生活中扮演了重要的角色，也被視為是生活經驗的中心；除此之外，情緒更影響著人類的行為、期望和對未來的評估。然而，負面情緒經驗相關研究仍缺乏，因此本研究旨在建立服務設計與生活中的負面情緒經驗間的相關性，以及對未來的服務設計提出新的見解。

本研究使用了文化探針(cultural probes)、扎根理論，以及深度訪談與問卷調查來關注負面情緒經驗與服務設計間的脈絡關係。透過乘客的自我記錄來發掘其負面情緒經驗，再把評價構造法(EGM)作為深度訪談之腳本，並透過數量化一類分析來理解情緒與服務特質兩種變數間的關聯性，最後由扎根理論來建立負面情緒經驗的關聯模式。

結果顯示，不同的負面情緒會由不同的刺激所喚起，乘客擁有調適自我的情緒反應，進而形成所謂的行為/互動策略。利用情緒評價理論解釋公車的負面情緒經驗歷程，乘客關注內心的安穩和負面的刺激形成了情緒評估的主要來源，這也是支持整段經驗的核心模板(core pattern)。綜合以上研究結果建立出負面情緒產生的經驗模式，乘客之情緒反應行為和具體的服務特徵間的連結關係被建立。最後，透過理解負面刺激的條件及學習乘客行為策略兩方面，對未來的公車服務提出設計建議：公車服務設計必須喚起更多的同理心、給予乘客更多的掌控感、創造一個被信任及準確的服務形象和大眾力量組成的反映管道，目的都是要讓乘客有個能夠安心搭乘的公車服務系統。

關鍵字：負面情緒、文化探針、使用者經驗、服務設計、扎根理論

Abstract

Nowadays, most societies are becoming service-based. Consuming a service means consuming an experience. In this informational age, the fields of cultural, social, and human interaction can be connected by the service design. The service design is a system challenge driven by the understanding of the human experience. As well as the relation between design and positive emotion, the understanding of the user experience has emerged between researchers and designers in the past decade. However, the researches of empirically documented the link between the users' negative emotion and service design are scant. In this thesis, the relationship between the negative stimulus of service and the emotional response is investigated. The context, the action, and the experience in the bus service are further discussed.

This study includes three methods, cultural probes, grounded theory, and survey. The cultural probes are a user-centred approach which was conducted to explore passengers' negative emotional experience by self-documentation. The survey is composed of an in-depth interview and a questionnaire, and the process of Evaluation Grid Method (EGM) was done in the interview phase, the other point is that the quantitative analyze of the questionnaire was conducted to study the accurate relationship between the emotions and the service features by Quantitative Type I analysis. Besides, the grounded theory was conducted to study the pattern of the negative emotional experience through conceptualization and data review.

Results show that the different negative emotion could be aroused by the different stimulus, and passengers had their own action / interaction strategies to response the stimulus. These correlations were based on the emotional appraisal

theory, and the balance between a potential concern to seek inner peace and external stimulus was delivered as a core pattern which support the whole experience. The reason for the negative emotions is resulted from the existence of intervening conditions reflect the stimulus to passenger, rather than the causal relationship from a lopsided view. Furthermore, the model of negative emotional experience was constructed by the correlations of the stimulus, the emotion, the action / interaction strategy, and concrete service feature. As a result, understanding the passengers' behavior can be inferred to the hardship points that suffered by passengers. According to these findings of the study, in order to have a better bus service, the future service should dedicated to evoke passengers' empathy, give passengers more control, create a trusted image, and an instant channel with the collection of public power. In conclusion, all design implications are aim to make passengers feel peace in their mind.

Keywords: negative emotion, cultural probes, user experience, service design, grounded theory

CONTENT

TABLE CONTENT

FIGURE CONTENT

Chapter1 Introduction

1-1   Background

The 19th and 20th century was all about industrialization, from cars to washing machines, the product ruled the roost. Today most economies are becoming service-based and people live in an information age (live│work, 2008). These services can be both tangible and intangible. They can involve artifacts and other things including communication, environment and behaviors. The fields of cultural, social and human interaction can be connected by service design, and it aims to provide people wonderful experience (Miettinen, Koivisto, 2009). However, in the last ten years, understanding user experience as well as the relation between design and emotions has emerged among researchers and designers. The study of emotions is relevant to human experience, Forlizzi & Battarbee (2004) pointed that emotion is the center of human experience, an element taking place between user and interaction, which provides a way to understand and communicate the experience. On the other hand, emotions also have a strong influence on live experience. They are a key part of experience, which influence people's actions, expectations, and future evaluations (Diener & Lucas, 2000, Battarbee , 2005).

In brief, service design is a system challenge driven by understanding of the human experience. That is, the development from consuming a product that solving problems to consuming a great experience that making people feel good. Therefore, emotion is very remarkable in the context of human experience.

1-2 Motivation

People have many unsatisfactory experiences when they use banks, buses, health services and insurance companies. These services don't make people feel happier or richer. Why are they not designed as well as the products we love to use such as an Apple iPod or a BMW? (live│work, 2008)

In fact, people are driven by the pursuit for of pleasure and the avoidance of displeasure. The purpose of design is to provide pleasure and minimize displeasure (Jordan 2000, Battarbee 2005). However, most of literatures focus on studying pleasure in order to create a satisfying design, only little literature has been focused on negative emotion to understand human experience. When it comes to the emotional influence, it is much easier to keep certain events in mind by the means of emotional stimulus than events without stimulus. The negative emotion also leaves memory deep in mind and clear to arouse (Isen, 1993; Brave, 2003; Norman et al., 2003). Perhaps, it may be easier to capture and observe negative emotions than positive ones within some experiences. Thus, the bus experience is chosen as a case study in which negative emotions obviously can be found frequently.

Due to the long existence of the bus transportation system here in Taiwan, it has been symbolically deemed as the blood vessel, by which big cities find their mobility and vitality. Despite its convenience, the bus passengers still encounter many problems and troubles which have been left unsolved. Compared with nice bus service in other countries, such as Japan, they not only concern the service quality but take care customers' feeling. In Taiwan, there are still too many unsatisfactory experiences, only when understand the context, a better service could be proposed. Hence, this

thesis focuses on the users' negative emotional experience while taking the bus service.

1-3   Objectives

This thesis strives to connect the bus service features and qualities to the emotional responses. The perceptions, the actions and the experiences of the bus passengers were studied. This thesis includes three objectives:

a.   Understanding the core pattern which supports the whole experience.

It is difficult to understand the whole emotional experience because every data seems to reveal its importance. As a result, the information should be integrated into one core process which covers and records key elements, such as behavioral descriptions and interactive sequences. It could be regarded as stages and phases of a passage, along with an explanation of what makes that passage move forward, halt, or take a downward turn (Strauss & Corbin, 1990).

b.   Constructing a model of negative emotional experience in the bus service.

Although realizing the negative emotions is useful for designer to gain background knowledge, there are still many factors that the designers cannot control. What kind of negative emotions should be addressed by the designers? How to control those emotions by design? The main goal is to develop a model that will explain how the services arouse emotions and how the passengers act. Only when having a deep understanding of the interactive context, the perception, and passenger's behavior, a better bus service framework can be produced.

c. Proposing implications to reduce the passengers' negative emotion in the bus service.

By understanding the negative emotion of user experience, there are two main ways to infer the implications for design. The first one is to analyze the context between stimulus and emotions. The second one is to learn the mental decision from passengers' action / interaction strategies. Both ways can be seen as the foundations to propose a bus service and to reduces or eliminates the passengers' negative emotions.

1-4 Research issue

In view of the preceding research objectives, three major research issues to be addressed in this thesis:

a. How to effectively apprehend the negative emotions of passengers' experience from the bus taking?

In considering the method of getting data, the issue may be discussed in order to have real and rich extraction from passengers. By designing a particular strategies and considerate way for passengers to follow, even give them enough space to express themselves. It is important that providing a good experience driven tools applied to understand the grooming experience of users. Because by using service design techniques that enable all levels of the service to engage with their users and understand their experiences it is possible to turn this involvement into real service improvements.

b. What are the stimulating factors of arousing negative emotions in the bus service?

According to Frijda (1986), any perceived stimulus has the potential to arouse an

emotion. And not only actual events but also remembered or imaged events have the potential to arouse emotions. In this thesis, the correlation between emotions and stimulating factors would be built in order to know what kind of stimulus should be concerned.

c. How do the bus passengers response their negative emotions?

From the notion of user-inspired design, it indicates that product or service strategy and design should start with understanding the user involved in. And there are many research methods that rely on observation of consumers' behavior or the self-documentary to help designers understand their users. Thus, knowing the mindset and strategies of users could be a driver to create a new design to fulfill users' needs.

1-5 Scope

The main subject discussed in this thesis is negative emotions of bus experience. There are two major concerns. One is passengers' emotion such as how their negative emotions aroused by stimulus. The other is passengers' behaviors such as how they deal with their negative emotions. Other passengers on the bus, such as driver will not be taken as the targeted object. Also, the research focuses on the bus service in Taipei. In addition, though there are many groups who take bus, the office worker group is chosen as the target for its majority of population. And the process of data collection and analysis was focus on the negative effects which were aroused by negative emotion.

1-6   Outline of thesis

This thesis consists of six chapters. The research background, motivation, objectives, scope, and outline of thesis are introduced in Chapter 1. Relevant studies of user inspired design, emotion, and service design are reviewed in Chapter 2. The research plan and method of data collecting are described in Chapter 3. The data collected are analyzed and the findings are summarized according to the method ground theory in Chapter 4. Building a model of experience and the issues which contribute to find out design implications are brought out for discussion in Chapter 5. In the end, the conclusion and recommends for future research are in Chapter 6.

Chapter2 Literature review

This chapter presents the relative studies of this thesis. First, emotion study has been regarded as highly significant subjects. It can be divided into several aspects to review. Second, this section presents the emerging discipline of service design has seen designers developing tools to support the creation of better services. In the last part, the research methodologies which were customary in human-centred design were introduced and explained.

2-1   Emotion study

Most work in the field of design and emotion is concerned with the emotional experience of the user. The following presents that the literature of the differences of emotion, classification, measures, influence, etc.

2-1-1   Emotion

What is emotion? Although the concept of emotion appears to be generally understood, it is still difficult to give it a solid definition. Frijda (1994) has pointed that affective states can be distinguished either by observable characteristics, or by the conditions. They can be separated into four types of affective states, such as moods, sentiments, emotions, and emotional traits (Table 2-1).

Table 2-1 Differentiating affective states (Frijda, 1994)

	Intentional	Non-intentional
Acute	Emotions	Moods
Dispositional	Sentiments	Emotional traits

Emotions are intentional because they imply and involve a relation between the person experiencing and a particular object: one is afraid of something, proud of something, in love with something and so on (Frijda, 1994). And the stimulus that elicits an emotion can be an event or some change within us. People are usually able to identify the object of their emotion (Ekman and Davison, 1994). And they know with whom they are angry or displeasure. Besides, emotions are acute, it only keep for relatively short period of time (Frijda, 1994; Carlson, 1997).

2-1-2 Classification

A number of studies have investigated the classification of emotions, as shown in Table2-2. Although they shows different rules and notion to classify emotions, but the classification of positive and negative is obvious to understand.

Table 2-2 classification of emotions

Researcher	Positive emotion	Negative emotion
Ortony et al. (1988)	**well-being** (satisfaction, joy, happiness, and excitement); appreciation (admire, respect, and reverence)	**distress** (depressed, upset, annoyed, worried, unhappy, unsatisfied, lonely, sad, regret, uneasy, and restless); **hopeless** (pitiful, sympathy, sorry, and empathy); **afraid** (worry, anxious, retreat, fearful, nervous and frightened); **disappointment** (frustrated and disappointed); **self-reproach** (embarrassed, guilty, self-condemned, shamed, uneasy, and uncomfortable); **reproach** (blamed, disguised, disdained and angry); **wrathful**(angry, confused, tempered, and annoyed);
Shaver et al. (1987)	love, joy, surprise	anger, sadness, fear
Lazarus (1991)	joy, happiness, pride, love, affection, relief, sympathy	anger, anxiety, fright, shame, sad, envy, depression, disguised
Russell (1980)	enthusiastic, elated, excited, euphoric, peppy, relaxed, content, at rest, calm, serene, at ease	dull, tired, drowsy, sluggish, bored, droopy
Ekman & Friesen (1971)	surprise, joy	disgust, fear, anger, contempt
Izard (1977)	Interest, surprise, joy	distress, disgust, fear, anger, shame, contempt, guilt
Plutchik (1980)	anticipation, surprise, joy	sadness, disgust, fear, anger, acceptance
Tomkins (1984)	interest, surprise, joy	distress, disgust, fear, anger, shame, contempt

2-1-3 Self-report measures

There are many ways to capture and measure emotions. In subjective perception, it is common to use self-report measures, this is kind of direct way to capture emotions. By designing questionnaire and have participants check the emotions they have at the moment. And there are two ways to design the questionnaire: single-item and multiple-items. The former is to ask people the perception of single emotion, such as do you feel displeasure. Then score the Likert-type scales with five or seven levels. The latter is separated into two parts, one is checklist of many emotions, the other is rating task for participants evaluate level of specific emotional (Larsen & Fredrickson, 1999；Brave & Nass, 2003). And the multiple items measures is chosen in this thesis.

2-1-4 Appraisal theory

In the experience of emotional design, the stimulus and concern, which elicit emotional responses, should be considered, it is useful for understanding the cause of emotion forming. As a result, use the concept of appraisal to explain the elicitation process of emotions. Arnold (1960) has defined emotion is "the felt tendency toward anything intuitively appraised as good (beneficial) or away from anything intuitively appraised as bad (harmful)." A basic model of emotions was drawn up based on this definition, as shown in Figure 2-1. The key variables are identified in the basic model: appraisal, concern, and stimulus. They are described as follows:

a. Appraisal

According to appraisal researchers, all emotions are preceded and elicited by an appraisal (Roseman & Smith, 2001). And different individuals who appraisal the same stimulus in different ways will feel different emotions, because an appraisal is a personal evaluation of stimulus, rather than the stimulus itself, which causes the

emotion (Desmet, 2002).

b. Concern

Concerns can be a reference of appraisal process, and the stimulus is determined by an appraisal concern match or mismatch: stimulus that match human's concerns are regarded as good; otherwise, as bad. Moreover, there are many kinds of concerns in the past literature, such as needs, motives, goals, and values (Scherer, 2001)

c. Stimulus

The stimulus can be a tangible product or in any other form to elicit an emotion (Frijda, 1986). And according to Desmet (2002), if given the focus on particular kinds of stimulus, the possible outcome of the appraisal process are limited to a particular set of emotions, such as product relevant emotions.
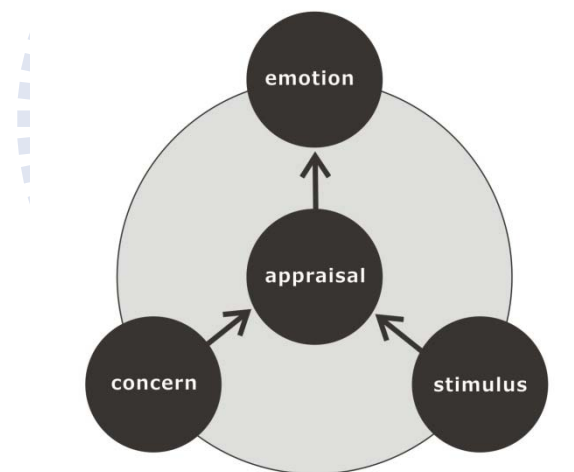
Figure 2-1 Basic model of emotions

2-1-5 Emotional influence

The effect of emotions can be divided into two phases to introduce: emotions elicited by stimulus and emotions as motivators for action. The former is a popular discussion among researchers in the field of design, because from a commercial point of view, it can be a useful study to attract people to make decision (Creusen, 1998). The latter has indicated emotions have many influences on our way of thinking. By

understanding the influence of emotion, it could analyze the cause of emotion forming in a logical way, and it is easier to interpret the notion under human's behaviors. According to Norman (2004), emotions affect people in many ways (Table 2-3):

Table 2-3 the influence of emotion

Type	Focusing	Memory	Creativity	Efficiency
Positive emotion	Open thinking and focus on whole situation	Difficult to remember the event with stimulus	Arouse curiosity and the creativity gets high	Satisfied with work and the efficiency gets high
Negative emotion	Narrowed thinking and with high attention	Easy to remember the event with stimulus	Limited	Limited

2-1-6 Brief summary

According to the literatures about emotion classification and identification, this thesis took those as a reference. And self-document method was conducted to capture people's emotion and experience because people can identify the object of their emotion and they know with whom they are angry or displeasure. Besides, the basic model of emotions, Appraisal theory, can be a key theory that supports our core pattern.

2-2 Service design

The emerging discipline of service design has seen designers developing tools to support the creation of better services. Its practitioners take a human-centred approach that focuses on customer experience and quality of encounter, identifying and improving the individual "touch-points" where a user experiences a service (Saco & Goncalves, 2008). Investment in public services has increased dramatically over the last decade, but today's services must respond to new challenges including a low

carbon economy, an ageing population and the rising demands of service users.

2-2-1   Introduction

A service is made up of several interactions through a range of touch-points over time. Service design ensures that all the touch-points work brilliantly to create wonderful experience. (live｜work, 2008)

Service design:

Service design addresses the functionality and form of services from the perspective of clients. It aims to ensure that service interfaces are useful, usable, and desirable from the client's point of view and effective, efficient, and distinctive from the supplier's point of view (Mager, 2008). Design for experiences that reach people through many different touch-points, and that happen over time. Besides, consuming a service means consuming an experience, a process that extends over time (Mager, 2009).

Service touch-points:

Service touch-points are tangible, such as place, objects, people or interaction (Moritz, 2005), that made up the total experience of using a service. They can be any form depend on the service.

There are five ways in which most services differ from manufactured products proposed by Design Council (2009):

1. **Customer contact -** Generally, in manufacturing the customer is probably unaware of how the product came about. In services, production and consumption tend to occur at the same time.

2. **Quality** - In manufacturing measures tend to be quantitative, and quality tends to be measured against things like drawings. The measures of quality in a service tend to be qualitative and there are few quantitative measures. As a result, there is

a wider variability in services and it is more difficult to control the quality of a service – as it is often down to the individual person supplying it.

3. **Storability** - Because services tend to be intangible, it is usually impossible to store them. For example, a car in a showroom if not sold today can be sold tomorrow but an empty seat on an airplane loses its value once the plane has left.

4. **Tangibility** - One can physically touch a manufactured product but most services are intangible. One cannot touch legal advice or a journey, though one can often see the results.

5. **Transportability** - Most services cannot be transported and therefore, exported (though the means of producing these services often can). It is estimated that only 11% of services are exportable although this is fast changing.

Table 2-4 the difference between service and product

	Manufactured product	Service
Form	tangible	Intangible(almost)
Customer contact	unawareness	Close
Measures	Quantitative	Qualitative
Storability	Storable	None
Transportability	High	Low

2-2-2 Frameworks

There are some basic frameworks for designing service better:

1. **Look at your service as a product:** Good design is connected to a good strategy. This is true for services just as much as for products. If service design is to be used in a substantial and not in a decorative manner it has to be connected to the business strategies. It is about fundamental questions of positioning and portfolio management.

2. **Focus on the customer benefit:** Rethinking the organization might be part of service design processes in order to create structures and processes that are focused on the delivery of benefit to a customer. It is radical change of perspective: moving from frontstage to backstage is revolutionary for many service providers even though it seems so natural.

3. **Dive into the customers' world:** Often the knowledge about the customer is very much rooted in the past and frozen in Excel sheets and diagrams. Service design explores in depth the vivid world of emotions and experiences, and help people to envision and describe more about their own desire.

4. **See the big picture:** The service experience might be start long before the customer gets in contact with provider, and the experience does not end with the "Goodbye". Service are embedded in large systems of relationships and interactions. And they need to take into consideration the changes users go through throughout the duration of the relationship.

5. **Design an experience:** The choreography of experience or at least of conditions that enable certain experiences is a major challenge in the service design process. Use techniques that have their roots in performing arts; learn from experience and interaction design in order to "design time".

6. **Create perceivable evidence:** Making the invisible visible and not yet existing perceivable is a contribution of service design. The invisible service needs to be transformed into perceivable evidence along the touch-points of service experience.

7. **Go for a standing ovation:** In many service encounters success depends on people. The service performance needs to be supported by a designed setting that serves the needs of the "actors". This might require a fundamental reflection upon the recruiting, development, empowerment and appraisal of people.

8. **Define flexible standards:** A 100% standardization as we often find it in production sites is not applicable to services; the right balance of standardization and flexibility needs to be defined, considering the type of service that is being designed.

9. **A living product:** Services need to be designed for learning and development; an open membrane towards customers, employees and environment needs to be part of the service system.

10. **Be enthusiastic:** The corporate culture has a major impact on the quality of the delivered service. An attentive observation of existing culture and a support of cultural change is thus part of the design process (Miettinen & Koivisto, 2009).

2-2-3   Brief summary

In the above section, the difference between product and service was presented, and many definitions of service keywords were explained for the later research. The frameworks of service design also can become a crucial reference for discussing design implications.

2-3 Research methodology

This section presents the research methods were conducted in this thesis. Most of them were customary in Human-Centred Design.

2-3-1   Personal involvement inventory

There is a simple test to evaluate the involvement index of participants. It is called Personal Involvement Inventory (PII), and it was created by Zaichkowsky on 1994. This test is kind of tool of measuring participant's involvement, and it is based on an

inventory that explored by the relationship between product and personal features, such as value, interest, and intrinsic need. Semantic Difference Method as a tool to measure goods. And the higher index participants get, the deeper involvement they have. The original PII test (Zaichkowsky, 1985) has twenty questions, then she modified the test into ten questions. She tried to use more precise questions to measure customers' involvement towards product or service. And the latest PII test also was used in this thesis.

2-3-2 Affinity diagram

The affinity diagram has become one of the most widely Japanese management and planning tools. It was developed to discovering meaningful groups of ideas within a raw list. And it is important to make the grouping process naturally, it means to use human's intuition, rather than according to preordained categories in mind. Usually, an affinity diagram is used to refine a brainstorm into something that makes sense and can be dealt with more easily. In brief, using the affinity diagram when facts or thoughts are uncertain and need to be organized, when preexisting ideas or paradigms need to be overcome, when ideas need to be clarified, and when unity within a team needs to be created.

The following is the Steps to create an affinity diagram:

1. Rapidly group ideas that seem to belong together.

2. It isn't important to define why they belong together.

3. Clarify any ideas in question.

4. Copy an idea into in more than one affinity set if appropriate.

5. Look for small sets. Should they belong in a larger group?

6. Do large sets need to be broken down more precisely?

7. When most of the ideas have been sorted, you can start to enter titles for each affinity set.

The Affinity process is a good way to get people to work on a creative level to address difficult issues. It may be used in situations that are unknown or unexplored, or in circumstances that seem confusing or disorganized, such as when people with diverse experiences form a new area, or when members have incomplete knowledge of the area of analysis.

2-3-3 Cultural probes

Typical service design methods adopting a human-centered approach include probes, customer personas and storytelling. And cultural probes are conducted in this thesis. Cultural probes are a user-centered approach to understanding human phenomena and explore design opportunities. The point of cultural probes was to create a dialogue between the designer and the user (Gaver et al., 1999). One of aims was to capture the stereotyped images of ageing people, as well as to develop sensibility in listening to other people and understanding the meaning underlying their actions (Gaver, 2001). They are almost on the basis of user participation by self-documentation. And probes can be conducted on many kinds of platform, such as on mobile or on-line. It aims to collect users' context and perceptions. The most common way to conduct them is self-documenting diary or self-photography (Mattelmäki, 2006). Hulkko et al. (2004) also points that the core notion of probes is to capture users' thoughts on the environment and actions by means of documentation, reflection, and expression. In brief, it is kinds of discovering and understanding the service context and the users participatory design method.

Four reasons to use probes as follows (Mattelmäki, 2006):

1. Inspiration: Probes can support and enrich the designer's or the team's inspiration.

2. Information: Probes can collect real information from target users.

3. Participation: Probe can provide the users with opportunities to participation in the process of research and ideation.

4. Dialogue: Probes can build up an interaction between the users and the designers, as well as within the design team, in accordance with the user-centered design principles.

2-3-4   Grounded theory

Grounded theory is a qualitative research approach that was collaboratively developed by Glaser and Strauss (1967). It is inductively derived from the study of the phenomenon it represents. Thus, it is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon (Strauss & Corbin, 1990). Most important of all, it is focus on logic of generation, rather than logic of verification. The whole process of grounded theory is to show how to build a theory. Therefore, it begins with an area of study and what is relevant to that area is allowed to emerge. Besides, Hammersley (1989) points that it is the most scientific method in qualitative research.

There are three main phases of coding: open coding, axis coding, and selective coding. And all codes start from separated to integrated ones.

1. open coding: The process of breaking down, examining, comparing, conceptualizing, and categorizing data.

2. axis coding: A set of procedures whereby data are put back together in new ways after open coding, by making connections between categories. This is done by utilizing a coding paradigm involving conditions, context, action / interactional strategies and consequences.

3. selective coding: The process of selecting the core category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development.

2-3-5 Evaluation grid method

Evaluation grid method (or EGM) is a kind of in-depth interview method, which paired comparison and interpretive structural modeling for structure identification. Sanui (1996) improved the repertory grid method (RGM), proposed by Kelly (1955), into evaluation grid method in two processes. First Step is to compare objects, people are asked to answer what is good or bad and what they like or dislike about them, it aims to pick out the potential stimulus that participant may have deeper perception. Second, through continuous questioning, the meaning and conditions of the answer are clarified. It is used mainly to capture individual perceptions and compile them into in a hierarchic structure (Sanui, 1996).

The reason why researchers use this method is that traditional general questionnaires could not dig out the real thought from users, actual behavior is often far from what users answer. By conducting EGM, researchers can realize "what values existed in user's mind" and "what's the linking relationship between feeling and practice".

The following is the process of EGM:

1. Prepare related image cards that can cover the evaluation target.

2. Ask the participant of grouping the cards into two groups: like and dislike.

3. Take those who like out and ask participant of grouping into groups according to the degree of like.

4. Ask the participants about the reasons of grouping.

2-3-6 Hayashi's quantification theory type Ⅰ analysis

Quantification theory type Ⅰ is well known as an effective method to deal with the relationship between criterion variables with quantitative values and explanatory variables with qualitative ones in our environments. (Tanaka & Wakimoto, 1983)

Especially, it is suitable for many cases in our environment. To use Hayashi's quantification theory type Ⅰ, the analyzer arranges explanatory variables to items and these qualitative values (alternatives) to categories. To calculate a regression on these items and categories, dummy variables are introduced. When a sample λ corresponds to item j and its category k, dummy variable $\delta(jk) = 1$, otherwise $\delta(jk) = 0$. The weight of each $\delta(jk)$ is calculated by regression. These derived values of weights are used to specify what categories and items have an effect on the criterion variable.

The general regression model of the Hayashi's Quantification Theory Type Ⅰ can be defined as follow: on each Kansei word λ, where j is item number, k is category number.

$$y^\lambda = \sum_{j=1}^{m} \sum_{k=1}^{c_j} a_{jk} x_{jk}^\lambda$$

where j = 1,2….,m (m is the total number of items) and k = 1,2,…, c_j (c_j is the total number of categories for item j).

In the above equation, a_{jk} is called partial regression coefficients or category scores (weights). The major goal of the above equation is to find coefficients a_{jk} in order to minimize the deviation between estimated values and real values. y^λ and x_{jk}^λ are called criterion variables and explanatory variables. The estimated values of a_{jk} can be derived by solving a simultaneous equation composed of the above equations. (Huang, 2007)

2-3-7 Brief summary

Even though above research methods are common ways in user-centred design, a good flow between each method should be put more emphasis. Each method had its own role in this thesis, from data collection to analysis phase, discussion section. The advantages of methods were used to link each phase and explored more valuable findings. The PII test was used to be a reference for recruiting, and the culture probes were conducted by asking people to document by themselves. Under the notion of Grounded theory, all data were conceptualized into higher phenomenon. The method of interview was conducted by the EGM, then through the Hayashi's quantification theory type I to analyze the correlations in data.
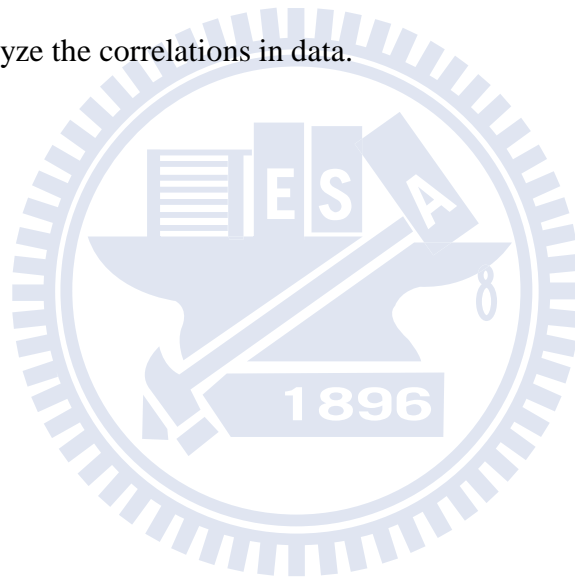
Chapter 3 Method

As was mentioned above, this thesis aims to apprehend the negative emotion from user experience of taking bus. A three-phase study was designed to explore the evaluation, correlation, and pattern of negative emotion. Figure 3-1 illustrates the process of whole study.
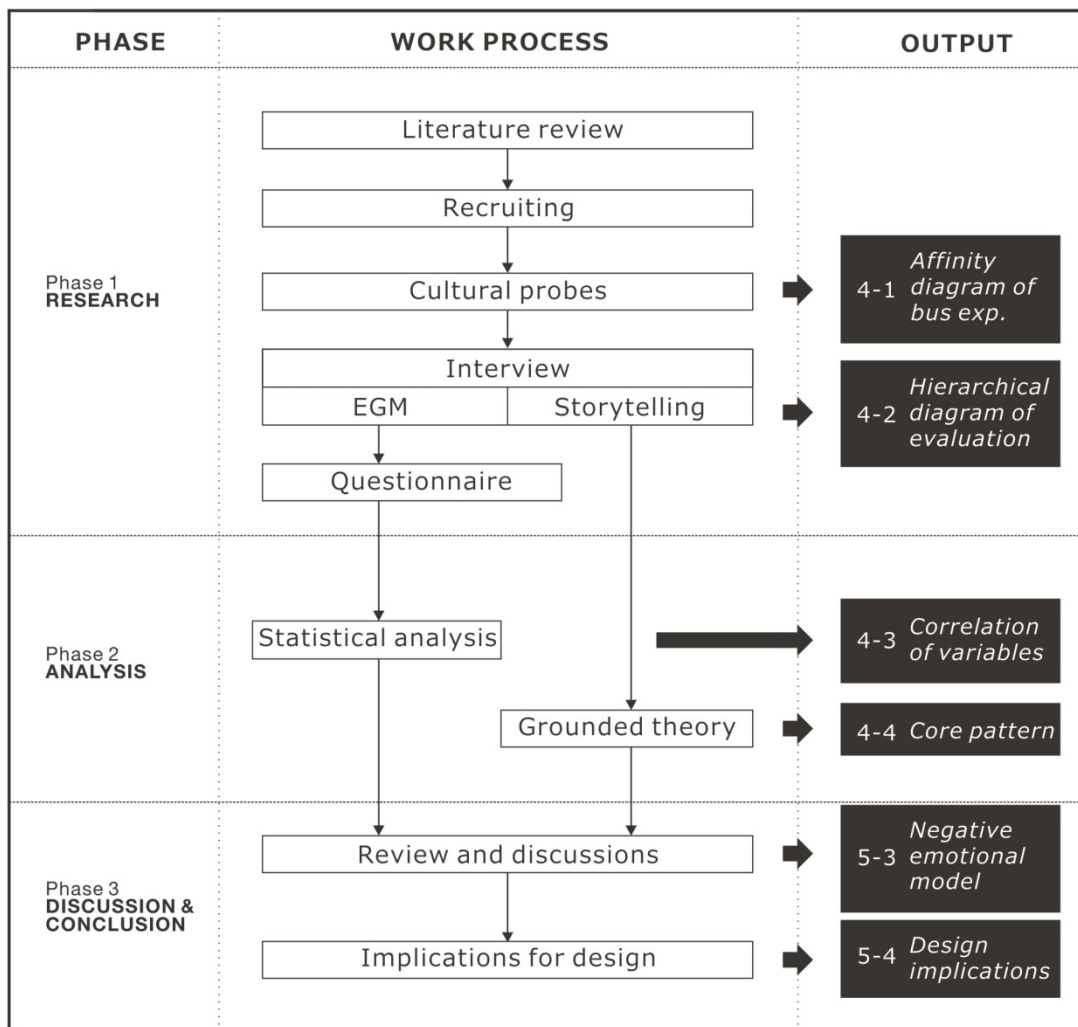
Figure 3-1 the process of this study

3-1 Data collection procedure

The first step was to recruit participants, and then data were collected by using cultural probes in which participants recorded during a displeasing event of taking bus. The interviews were conducted after receiving the data of probes.

3-1-1 Recruiting

The participants for this thesis were selected from the population of office workers taking buses in Taipei as their commuting vehicle. Snowball sampling was used to recruit participants. Participants were recruited through posted information on BBS, and by word of mouth to friends, classmates, and any possible way. Besides, there were so many people interested in this research, and they also asked many questions about the method and discussed some embarrassing experiences they ever had. It was a good start to make people get involved into this research. Table 3-1 lists the questions and requirements we needed. Besides, this thesis not only searched the participant who was fit with the requirement, but also conducting a simple test to evaluate the involvement index. It is called Personal Involvement Inventory (PII) (Zaichkowsky, 1994). The latest PII test only has ten questions, and there are more precise questions to measure customers' involvement towards product or service. Table 3-2 provides the result of PII test, from 10 to 30 is low involvement; from 31 to 50 is medium involvement; from 51 to 70 is high involvement.

Table 3-1 requirement setting

Basic requirements
Gender: Male or Female
Career: office worker
Bus experience: over 1 year and take bus to office
Area: Taipei, Taiwan
Also ask some questions, such as:
1. Do you like to take bus?
2. What do you do when you take bus?
3. How long you have to spend by traffic?
4. Do you notice other passengers' behaviors?
5. Did you have any negative experience on

Table 3-2 Personal Involvement Inventory test

question	keyword	score & option
Taking bus is important to me.	important	1=strongly disagree
Taking bus is revevant with my life.	relevant	2=disagree
Taking bus appealed to me.	appealing	3=slightly disagree
I am fascinated with taking bus.	fascinating	4=normal
Taking bus is worthless.	worthless	5=slightly agree
I think I need to taking bus.	need	6=agree
I want to know further about taking bus.	involving	7=strongly agree
Taking bus for me means a lot.	means a lot	
I am interesting in taking bus.	interesting	
When it comes to taking bus, I am excited.	exciting	

The qualified candidates for this research had been selected from participants who have the following criteria:

1. Qualified candidates have the PII index in the range of medium or high involvement. (It means from 31 to 70.)

2. For the frequency of taking bus, qualified candidates have to take bus at least 3 times per week.

3. Qualified candidates have to work and take the bus always inside Taipei area.

Apart from above three conditions, we had tried to keep gender distribution fair. There were total 11 participants selected as from Taipei workers. As shown in Table 3-3, five of them were male and the others were female.

Table 3-3 the result of PII test and personal information

number	gender	age	working time	traffic time	title	frequency	PII test	interview
A	F	21-25	9:00-18:00	bus 30 mins	supervisor	6 / week	42	Y
B	F	21-25	8:30-17:30	bus 50 mins / bus →Mrt→walk 40	engineer	5 / week	52	Y
C	M	31-35	9:00-18:00	bus 20mins	designer	4 / week	44	Y
D	F	26-30	8:00-18:00	Mrt 15mins → bus 3mins	Specialist	5 / week	36	N
E	F	21-25	9:30-18:30	bus 10-15 mins	assistant	5 / week	48	Y
F	M	26-30	9:00-18:30	bus 20 mins	designer	5 / week	34	N
G	F	21-25	8:30-17:30	bus 40-60 mins	cad drafter	5 / week	34	N
H	M	26-30	8:00-17:00	bus 20-25	engineer	5 / week	41	Y
I	M	31-35	8:30-17:30	bus 20 mins	sales	5 / week	33	N
J	M	26-30	9:00-18:00	bus 15 mins	Specialist	5 / week	40	Y
K	F	26-30	9:00-18:00	bus 40 mins	designer	5 / week	35	Y

3-1-2 Probes

Designing good probes provide users their own space to describe and record the negative emotional events when they take the bus. Through the probes kit to capture the negative emotions; however, due to the privacy issue, camera was banned to record the negative events, therefore handwritten documentary was used. Besides, due to the need of the environmental data, participants were asked to take some pictures of their way to company and home.

In this thesis, the methods we used claim that participants' real thoughts and values could be abstracted. Under this notion, participants should be well-understood about the theme of this study. Even though they were heavy bus users, they still have to became more sensitive about negative emotions aroused by the instruction in the

probes. As a result, cultural probes were designed for participants to document without interrupting their original activities. As if the researcher observes around them, it can create a communication linked between the users and the researchers, the collected information of which often inspires the design team. And there are four tools in the probes: (A) instruction and mission, (B) negative events documentation, (C) negative emotion check box, and (D) reward. (Figure 3-2)

Figure 3-2 probes

a. **Instruction and mission**

In order to enhance participants' involvement in their bus experience, the main idea and aim of probes were introduced to participants. (Figure 3-3) A good introduction could arouse participants' passion. As the instruction mentioned that this thesis can be a basic foundation of co-design, and gave free hand to all participants. Besides, there was a mission for them to record the background information from house to company by taking photos. These photos could be the resources for later interview section (Figure 3-4).

Figure 3-3 Instruction

Figure 3-4 environmental photos from participants

b. Negative events documentation

In this section, there was a basic column of time and a big space for telling story (describing negative experience at that time). Besides, there was no deadline for participants. It depended on their documentary conditions, such as shown in Figure 3-5.
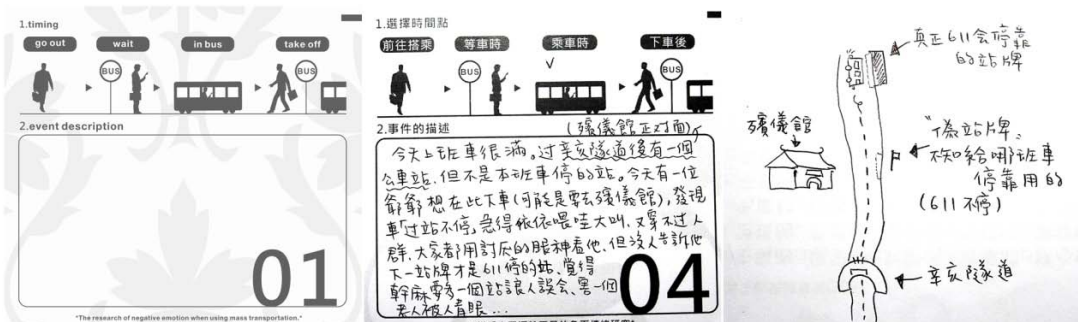
Figure 3-5 Event recording

c. Negative emotion check box

According to the literature review, there are too many kinds of emotions to tell the differences. Actually, users usually do not know the literal definitions of negative emotions they have, not to mention what they felt could be complicated emotional compounds. In general, they just think they are unhappy or uncomfortable. Therefore, the self-document check box could help people to check their negative emotions and the measure they can use to describe. That's why emotional check box was chosen for the probes (Figure 3-6).

Moreover, the term of common negative emotions should be chosen in order to make sure participants understand those terms. As a result, many negative emotional vocabularies were collected from many websites and magazines, which are related to public service. Finally, forty negative emotional words were selected through the discussion of focus group. The emotional words we choose are as follows:

angry, hateful, anxious, worried, frustrated, repugnant, ashamed, disdainful, disdainful, helpless, astonished, sad, abnormal, miserable, afraid, uneasy, agitated, doubtful, fury, heartbreak, tired, upset, boring, nervous, distress, disappointed, painful, melancholy, resentful, complicated, perturbed, hysterical, suppressed, gloomy, embarrassed, have no alternative, troublesome, contradictory, unbelievable, and exaggerated.
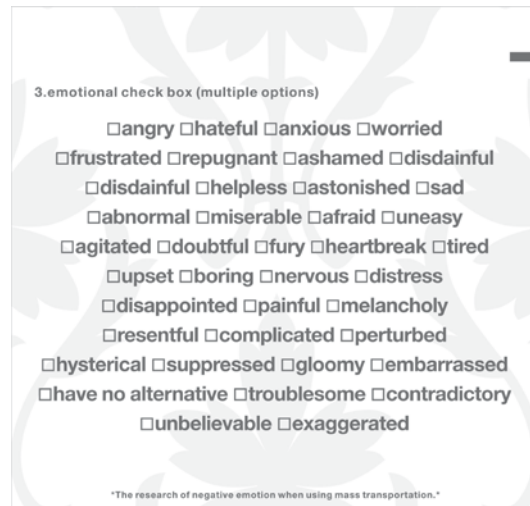
Figure 3-6 emotional check box

After the probes were received, the first step was to code any useful messages from design probes. At the same time, the number of coding from each probe was counted to check the unity of ideas and it can be a tool to decide the number of probes we have to deliver. Then, all codes were printed, from the lower level to create a super-head. As a result, the whole negative emotional components were sorted by drawing affinity diagram.

3-1-3 Interview

Negative stories, different emotions, and environmental photos were the resource for interview. According to the probes participants returned, there were seven participants (four female, three male, see Table 3-3) had been kept for the interview section. Figure 3-7 shows the photos of interviewers, their forty-minute interviews had been voice-recorded. There were two works in the interviews, one was by storytelling to understand the context, and the other was through evaluation grid method (EGM). Besides, the outline of storytelling was according to the affinity diagram of the whole experience. However, abstract feeling, original evaluation, and concrete features were recorded in a systematic way, EGM. Finally, the hierarchical of evaluation diagram

was performed.

Figure 3-7 photos of interviews

a. Tools

In order to make the interviews go smoothly, the clear understandings of each participant probes is necessary. Figure 3-8 presents some tools for interview, such as story cards, environmental photos, supplementary memo, sound recorder, and etc. Story cards were made from probes, and they can help participants easily share their stories. The environmental photos were printed on a board, where there are pictures participant can point out to show the places they mentioned in their stories. In brief, they use certain tools, such as pictures, records, inspired with different materials and storytelling to generate ideas. The aim of make-tools is to collect data from participants and to make them easily verbalize their experiences. Thus, tools help them to express themselves and reveal subconscious feelings and thoughts.

Figure 3-8 tools for interview

b. Process

In order to understand the perception and sense of value when people face those negative events, a personal interview method, evaluation grid method, was conducted to dig out people's mental value structure. This method also visually expresses the structure of the later evaluation.

The following is the process of the interview based on evaluation grid method:

Step1. Card sorting

Ask participants to sort story cards into different groups, it could make them think every story again. And it also had many possibilities to make them speak out their feelings and perceptions.

Step2. Storytelling

Start to introduce from the most hated group, and listen to their stories carefully, because there are still many important ideas behind their stories. And they would be asked to explain their emotions of different moments in one experience.

Step3. Structure building

Use the EGM to elicit their original evaluations, abstract feeling and concrete features,

such as the following content, also shown in Figure 3-9:

1. Why did you sort this negative stories together? Because of OO. (middle item)

2. Why don't you like OO? What do you feel? The sense of XX. (concrete item)

3. Specifically, what's OO? That's &&. (abstract item)
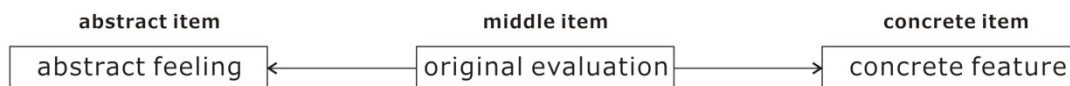
Figure 3-9 the structure of EGM diagram

Finally, each EGM diagram was done. Figure 3-10 shows the different mental mindsets of evaluation and the frequency of each item was calculated and linked all the relationships by lines.
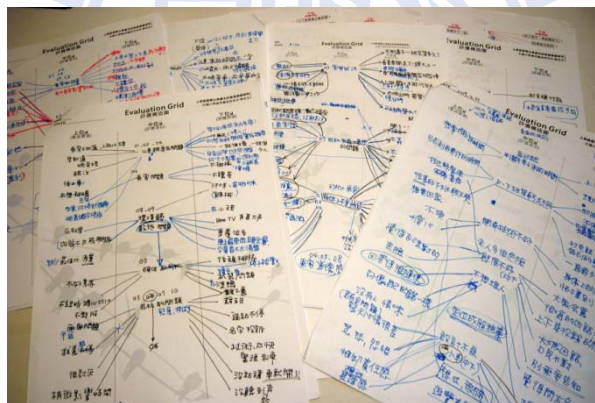
Figure 3-10 EGM drafts

Step4. Consolidation

Through the frequency comparison, all EGM diagrams were consolidated into one diagram, in which relationships between each item were shown. In brief, review all the process, from getting the result of interview to drawing EGM diagram. This procedure had turned complicated data into a systematic presentation. The Evaluation Grid Method is not only suitable for abstracting real factors inside the experience, but also can be regarded as a good reference for designing service or product.

Step5. Emotions sorting

In the EGM diagram, abstract items still have to be processed into useful materials for later discussions. Focus group was applied for classifying those emotions into suitable categories. And the emotional literature was referenced for the process of naming.

3-2 Questionnaire

In order to realize the correlation between specific emotions (abstract item) and concreted factors (concrete item), questionnaire was designed for the later quantitative analysis. However, this research was under quantification theory type I analysis for obtaining the degree of importance and influence of all items. Understand the relationships between items by questionnaire. Then choose the items listed in the EGM diagram from interviewers. Take these items to design a new questionnaire; let experimental subjects select which "concrete features" item that would affect "original evaluation" factor for analyzing quantification theory type I. Participants had to fill out the first part of questionnaire which asked the most representative main feature of each original evaluation that resulted in the abstract feelings formed, the second part was to measure the abstract feelings by 5 ladder Likert-type scale, as shown in Table 3-4, 3-5. And the contents of Table 3-4 was regarded as explanatory variable which had qualitative values, Table 3-5 was regarded as criterion variable which had quantitative values.

There were two ways to conduct, one was through the on-line questionnaire system, My3Q, and the other was the field survey. Table 3-4 gives the example of questionnaire, the concreted features were proposed to people to choose the most representative one from each item. The final questionnaire is in the appendix.

Table 3-4 the first part of questionnaire (explanatory variables)

structure

Emotion	Items		concrete feature (choose one from each part)
A.Reproach	A1.management problem	V	out of schedule
			late when it rain
			many buses come in the same time
			pass stop without stopping
			payment problem
			small bus for lots people
	A2.un-safety driving		catch up schedule with high speed
		V	easy to fall down
			drive before people sit down
			turn a corner with high speed
			bad gear skill
			suddenly brake
	A3.bad attitude		pass stop without stopping
			drive before people sit down
		V	catch up schedule with high speed
			unconcern
			bad answering to passenger
			all are passengers' fault
			drive fast when getting off
	A4.other passengers' effect		using phone with high volume
			fight for boarding/getting off
			noise
			fight for the seats
			no yield seats to elderly people
			priority seats are not enough
			smell bad
		V	stuck in the middle of bus

questionnaire layout

In "management problem", which make you feel REPROACH?
1. out of schedule ☐
2. late when it rain ☐
3. many buses come … ☐
4. pass stop without… ☐
5. payment problem ☐
6. small bus for lots… ☐

In "un-safety driving", which make you feel REPROACH?
1. catch up schedule… ☐
2. drive before people sit… ☐
3. easy to fall down ☐
4. turn a corner with high… ☐
5. bad gear skill ☐
6. suddenly brake ☐

In "driver's bad attitude", which make you feel REPROACH?
1. pass stop without… ☐
2. drive before people… ☐
3. catch up schedule… ☐
4. unconcern ☐
5. bad answering to … ☐
6. all are passengers… ☐
7. drive fast when getting… ☐

In "other passengers' effect", which make you feel REPROACH?
1. using phone with… ☐
2. fight for boarding… ☐
3. noise ☐
4. fight for the seat ☐
5. no yield seats to… ☐
6. priority seats are not… ☐
7. smell bad ☐
8. stuck in the middle… ☐

Table 3-5 the second part of questionnaire (criterion variables)

Please think about your negative emotion of bus experience!	very different	Different	Normal	similar	very similar	STIMULUS
1.Reproach	☐	☐	☐	☐	☐	management problem / un-safety driving / bad attitude / other passengers' effect
2.Fatigue	☐	☐	☐	☐	☐	management problem / un-safety driving / bad attitude / other passengers' effect
3.Afraid	☐	☐	☐	☐	☐	management problem / un-safety driving / bad attitude / hardware poorly maintained
4.Disappointtment	☐	☐	☐	☐	☐	management problem / other passengers' effect
5.Distress	☐	☐	☐	☐	☐	management problem / other passengers' effect / hardware poorly maintained

3-3 Data Analysis

Both quantitative and qualitative data analyses were processed. The first data analysis was carried out by means of quantification theory type Ⅰ approach, which was customary in questionnaire analysis. To address the pattern under negative emotions, the Grounded Theory was used.

3-3-1 Correlations building by Hayashi's quantification theory type Ⅰ analysis

From the questionnaire made by EGM, the relationship between linking data were calculated in according to the Quantification Theory Type Ⅰ. There were two kinds of data were collected, the first part of questionnaire was the question of representative concrete features (see Table 3-4) and the second part was the Likert-type scale to measure the emotional perception of negative bus experience (see Table 3-5). Then, the data was analyzed by quantification theory type I, the data collected from first part was regarded as the explanatory variable, and the data collected from second part was regarded as criterion variable.

The qualitative data from first part of questionnaire were transferred into quantitative data, such as "1" means the first feature was checked, "2" means the second one was check, and so on. For instance, the Table3-4 can be transferred into numbers, 1, 2, 3, and 8. And the answer for second part was directly recorded by score 1 to 5, from very different to very similar.

Quantitative type Ⅰ analysis was applied for many times for each abstract feeling. The correlation between quantitative items and qualitative items were calculated. As a

result, the precise correlations of weight were performed in the end.

3-3-2 Pattern finding by Grounded theory

According to the data collected by interview and probes, everything was regarded as our data, and all of them were coded into different categories. Moreover, three coding methods of grounded theory were conducted, and the core pattern of negative emotions was delivered in the end.

a. Open coding

During the first of these, open coding, the Figure 3-11 presents the process of conceptualization, such as searching categories and clustering these categories into super-categories with abstract labels. A large number of complex data were conceptualized into abstract phenomenon. Moreover, the properties and dimensions of phenomenon were discovered from data, it gave authors an open-minded to study.
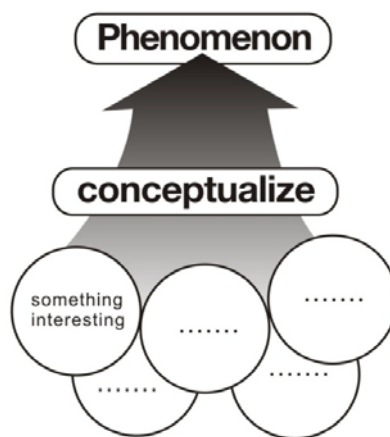
Figure 3-11 the process of conceptualization

b. axis coding

During the second coding process, axis coding, patterns and relationships within and between categories were found, such as linking conditions, context, strategies of action and interaction, and results. As Figure 3-12 shows that all the data were

clustered together again. But the aim of this phase is not to establish an entire theory structure but to develop the big categories. In addition, although both of open coding and axis coding were at different phases, in fact, it usually went back to check again and again. For example, the categories collected by the open coding can be linked into a consequence by their causal relationships.
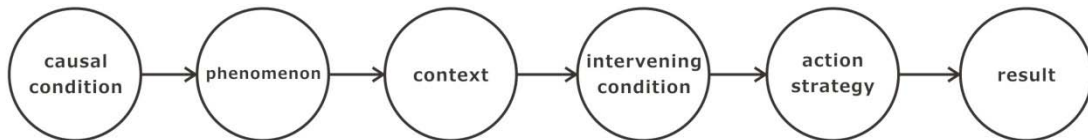
Figure 3-12 the model of axis coding

c. Selective coding

During the third coding process, axis coding was linked to each category, and improved the relationship between each other. The more completed process would be filled in those developing categories. Compared with axis coding, in this phase consolidating all data in a more abstractive level was the main notion. And in order to develop a clear and core diagram of pattern, it could be found by the following steps: (A) described the context of each phenomenon, (B) linked the core categories with minor categories, (C) proved all relationships, (D) filled in categories, and above steps were not fixed to do. For example, the main phenomenon done by the phase of axis coding can be organized by their importance, and the core pattern can be discovered little by little.

Chapter 4 Result

The gains of the first phase include all codes sorted by affinity diagram and users' hierarchical diagram of evaluation. At second phase, the findings include the correlation between emotions and concrete factors, and the core pattern of phenomenon. The last phase, a model of negative emotion was delivered in next chapter. There are four results of research in this chapter, affinity diagram of codes, hierarchical diagram of evaluation, correlations between service feature and emotion, and core pattern of negative emotion forming.

4-1   Affinity diagram of negative bus experience

All codes were printed out, from the lower level to create a super-head again and again by the method of affinity diagram. As a result, Figure 4-1 illustrates the whole components of experience by drawing affinity diagram.

See Figure 4-1, from the highest level to lowest level, level 5 and 4 indicates the crucial factors in negative bus experience were composed by three factors, included environment, behavior, and emotions. And the level 3 shows the intervening factors that were the outlines used in the interview, for instance, participants were asked to answer the interaction with the other people, the reaction they had, what was the stimulus resource, etc,. Besides, level 2 and 1 presents the phenomenon was found by the probes, the lower level could become the resource for the analysis of grounded theory, such as the phase of open coding. Thus, this diagram was kind of structure of research, and all levels were referenced by the whole thesis.
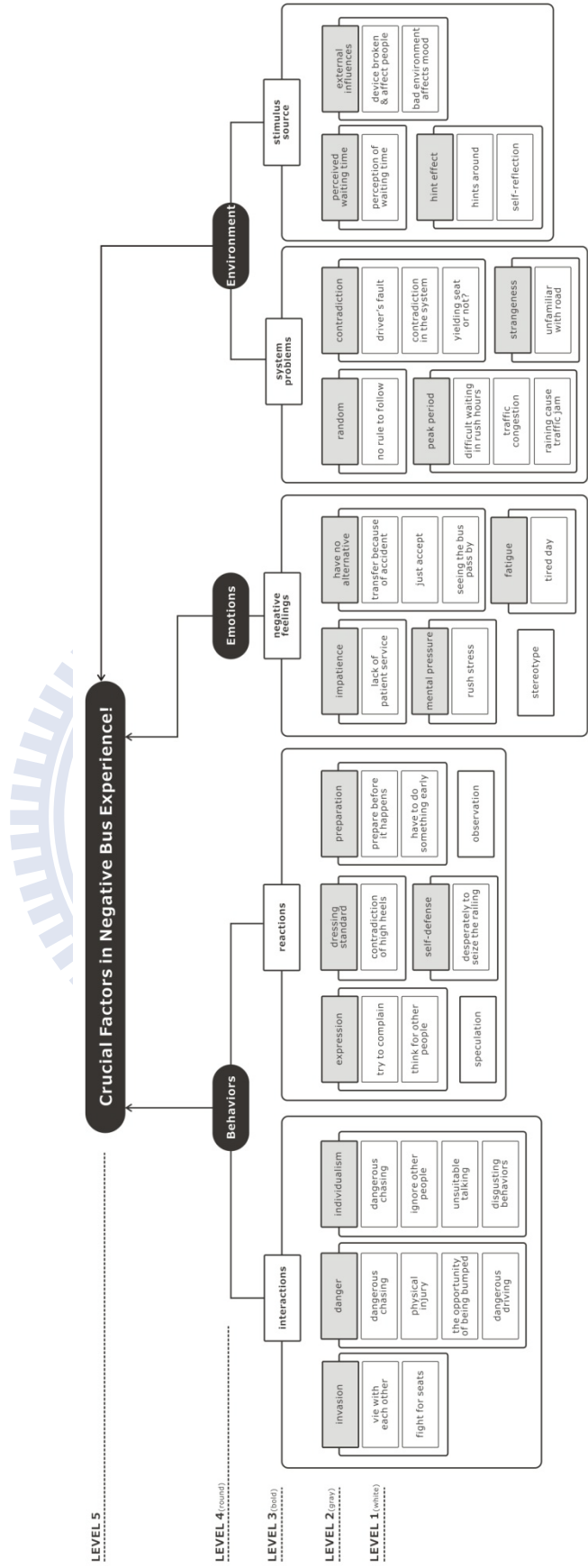
Figure 4-1 crucial factors in negative bus experience

On extraction of ideas, it was based on eleven probes. Because the extraction process tended to decreasing, it meant the data we collected was consistent, perhaps getting more data from new participants was not necessary. And Figure 4-2 presents the decreasing of ideas:
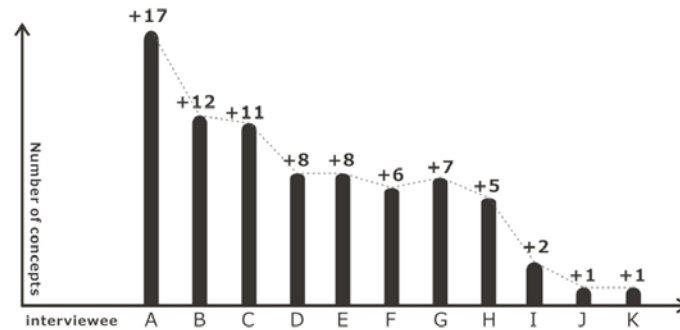
Figure 4-2 decreasing of ideas

4-2 Hierarchical diagram of passengers' evaluation

Through the frequency comparison, all EGM diagrams were consolidated into one diagram, therefore the whole relationships between each item were performed. Figure 4-3 indicates the hierarchical diagram of evaluation by EGM from 7 participants.

Figure 4-3 indicates that the original evaluation items are "management problem", "un-safety driving", "driver's bad attitude", "other passengers' effect", and "hardware poorly maintained". And the left side of original evaluation items is abstract items that represent the meaning of original evaluation items for participants. The right side of original evaluation items is concrete items that mean the more concrete feature from original evaluation items. The lines between each item mean the highly correlations. Besides, the numbers by the side of abstract and concrete items show the frequency of the same answer was proposed by participants.

It is also found from Figure 4-3 that the abstract item of "angry" has the maximum

value among abstract items, and it has the middle items of "management problem", "un-safety driving", and "bad attitude". The management problem item has the concrete items of "out of schedule", "late when it rain", "many buses come at the same time", "pass by stop without stopping", "payment problem", "small bus for lots people". The un-safety driving item has the concrete items of "catch up schedule with high speed", "easy to fall down", "departure   before people sit down", "turn a corner with high speed", "bad gear skill", "suddenly brake". The bad attitude item has the concrete items of "pass by stop with stopping", "departure before people sit down", "catch up schedule with high speed", "unconcern", "badly answering to passenger", "shirk self-responsibility to passenger", "drive fast when passenger just getting off". The three original evaluation items indicate that all of them have relations with the understanding and cognition of bus service.

However, the abstract items were indicated the emotions occurred frequently: they are angry, worried, helpless, astonished, nervous, afraid, disappointed, painful, embarrassed, repugnant, hateful, detestable, resentful, disdainful, tired, and have no alternative. It could be too complicated to apply for the later research, so all emotions were grouped to make the result easy to understand and apply. Therefore the method of focus group was applied for organizing the EGM diagram, and then came out 5 abstract feelings (abstract item) with the classification rules form literature especially presented by Ortony, Clore & Collins (1998). And then found out the corresponding original evaluation (middle item) and concrete features (concrete item). Table 4-1 shows five main emotional types were delivered, they are afraid, disappointment, distress, reproach, fatigue. And Figure 4-4 illustrates a new EGM diagram with new emotion combinations (abstract item).

Ladder-up item
abstract meaning
↓

Middle item
original evaluation
↓

Ladder-down item
concrete feature
↓

18 angry
8 worried
4 helpless
5 resentful
6 hateful
9 tired
8 disappointed
10 have no alternative
16 detestable
9 nervous
11 repugment
8 painful
4 afraid
9 astonished
6 disdainful
10 barrassed

management problem
24

unsafety driving
21

bad attitude
25

other passengers'effect
21

hardware poorly maintained
14

out of schedule 9
late when it rain 3
many buses come at the same time 3
pass by stop without stopping 4
payment problem 3
small bus for lots people 2
catch up schedule with high speed 5
easy to fall down 3
departure before people sit down 6
turn a corner with high speed 2
bad gear skill 3
suddenly brake 2
unconcern 4
bad answering to passenger 2
shirk self-responsibility to passenger 2
drive fast when passenger just getting off 2
using phone with high volume 3
fight for boarding/getting off 4
noise 2
fight for the seats 2
no yield seats to elderly people 4
priority seats are not enough 2
smell bad 2
stuck in the middle of bus 2
uncomfortable single seat 3
screen flicker 2
no regular maintenance of old thing 2
off-belt fault 3
aesthetic damage by many daub 2
scrolling text marquee fault 2

Figure 4-3 the hierarchical diagram of evaluation

Table 4-1 emotion clusters

clusters	emotions
afraid	afraid
	nervous
	astunished
	helpless
disappointment	disappointed
distress	painful
	worried
	embarrassed
reproach	angry
	repugment
	hateful
	detestable
	resentful
	disdainful
fatigue	have no alternative
	tired

4-3 Correlations between service features and emotions

Finally, participants who filled the questionnaire were 47 office workers (includes 12 male and 35 female) who took bus as a transportation tool. And there were 22 questionnaires via the internet, 25 questionnaires by face to face visit. The data from questionnaire was analyzed by quantification theory type I in this section.

Quantitative Type I analysis was applied for 5 times for each abstract feeling: "afraid", "disappointment", "distress", "reproach", and "fatigue", concrete feature of each were listed below.
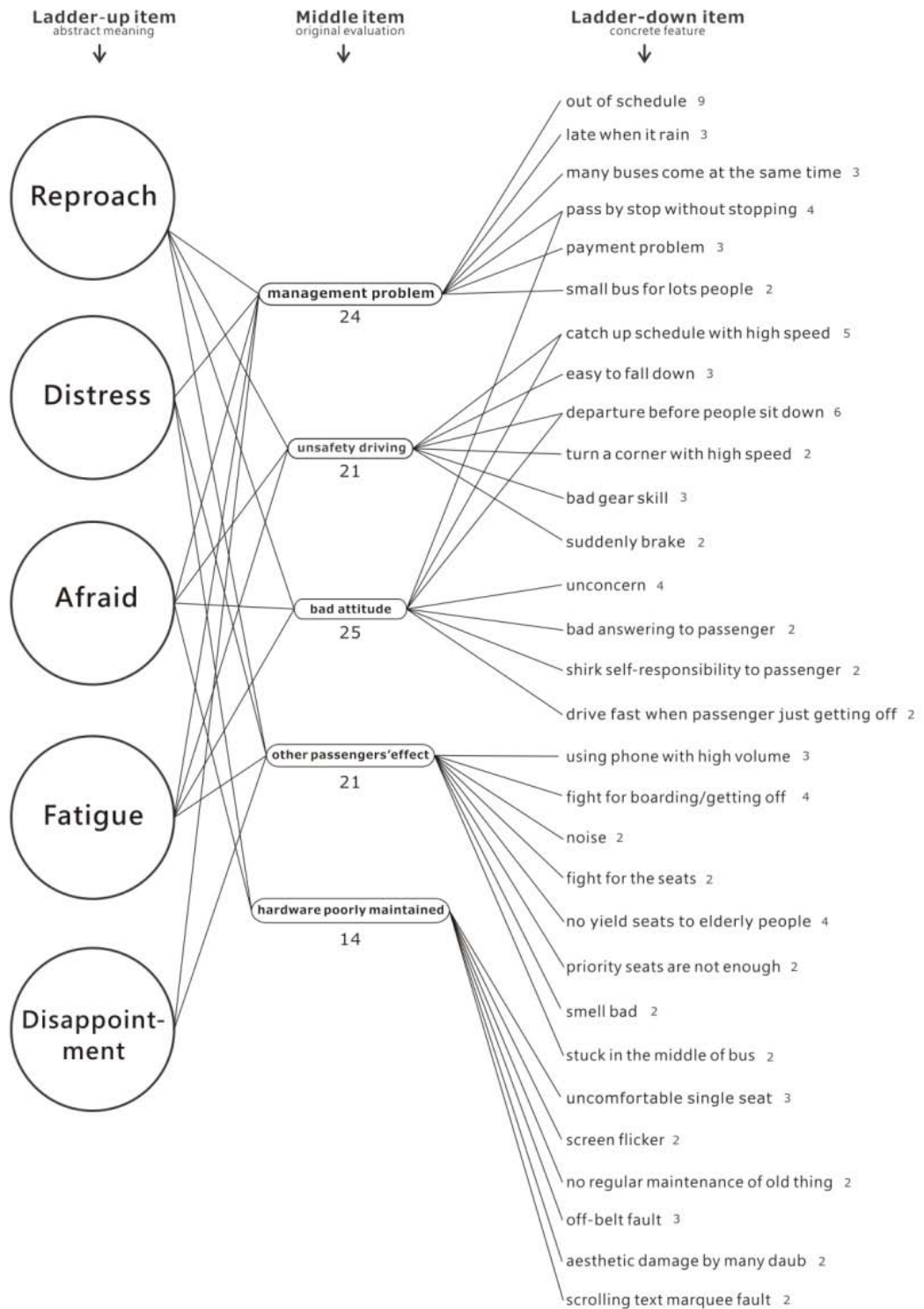
Figure 4-4 the modified EGM diagram

4-3-1 Reproach

According to the Quantification Theory Type I analysis, the item "bad attitude (0.679)" has the highest correlation coefficient and it should results in eliciting the sense of reproach. Besides, the category "unconcern (1.927)" with highest and positive score could be the main feature making people feel reproach, and the multiple correlation coefficient in table is 0.759, the coefficient of determination is 0.577, as shown in Table 4-2. The item "other passengers' effect" has a close coefficient, and the item also was considered in the later discussion section.

Table 4-2 result of reproach analysis

Abstract feeling	item	category	value	coeffient
A.Reproach	A1.management problem	out of schedule	-0.153	0.621
		late when it rain	0.536	
		many buses come in the same time	-0.646	
		pass stop without stopping	0.220	
		payment problem	-0.811	
		small bus for lots people	0.561	
	A2.un-safety driving	catch up schedule with high speed	0.467	0.586
		easy to fall down	-0.435	
		drive before people sit down	-0.022	
		turn a corner with high speed	-0.981	
		bad gear skill	0.408	
		suddenly brake	0.268	
	A3.bad attitude	pass stop without stopping	-0.072	0.679
		drive before people sit down	1.520	
		catch up schedule with high speed	-0.339	
		unconcern	**1.927**	
		bad answering to passenger	-0.321	
		all are passengers' fault	0.006	
		drive fast when getting off	-0.729	
	A4.other passengers' effect	using phone with high volume	-0.520	0.626
		fight for boarding/getting off	0.030	
		noise	-0.816	
		fight for the seats	-0.552	
		no yield seats to elderly people	0.905	
		priority seats are not enough	-0.070	
		smell bad	0.185	
		stuck in the middle of bus	0.120	
		R = 0.759	K=3.881	
		R^2= 0.577		

4-3-2 Distress

The item "other passengers' effect (0.413)" has the highest correlation coefficient and it should results in arousing the sense of distress. Besides, the category "priority seats are not enough (0.428)" with highest and positive score could be the main feature making people feel distress, and the multiple correlation coefficient in table is 0.513, the coefficient of determination is 0.264, as shown in Table 4-3. The item "management problem" has a close coefficient, and the item also was considered in the later discussion section.

Table 4-3 the result of distress analysis

Abstract feeling	item	category	value	coeffient
B.distress	B1.management problem	out of schedule	0.121	0.407
		late when it rain	0.447	
		many buses come in the same time	-0.531	
		pass stop without stopping	0.077	
		payment problem	-0.104	
		small bus for lots people	**0.457**	
	B2.other passengers' effect	using phone with high volume	-0.191	**0.413**
		fight for boarding/getting off	0.354	
		noise	-0.384	
		fight for the seats	-0.818	
		no yield seats to elderly people	-0.041	
		priority seats are not enough	**0.428**	
		smell bad	0.311	
		stuck in the middle of bus	-0.419	
	B3.hardware poorly maitained	umcomfortable single seat	**0.657**	0.211
		screen flicker	0.059	
		no regular maitenance of old	0.065	
		off bell fault	-0.081	
		aesthetic damage by many daub	-0.030	
		scrolling text marquee fault	-0.119	
		R = 0.513	K=2.774	
		R^2= 0.264		

4-3-3 Afraid

The item "un-safety driving (0.414)" has the highest correlation coefficient and it should results in arousing the sense of afraid. Besides, the category "catch up schedule with high speed (0.538)" with highest and positive score could be the main feature making people feel afraid and the multiple correlation coefficient in table is 0.530, the coefficient of determination is 0.282, as shown in Table 4-4.

Table 4-4 result of afraid analysis

Abstract feeling	item	category	value	coeffient
C.afraid	C1.management problem	out of schedule	-0.248	0.224
		late when it rain	-0.228	
		many buses come in the same time	0.092	
		pass stop without stopping	-0.055	
		payment problem	0.122	
		small bus for lots people	0.194	
	A2.un-safety driving	catch up schedule with high speed	0.538	0.414
		easy to fall down	-0.582	
		drive before people sit down	-0.330	
		turn a corner with high speed	-0.138	
		bad gear skill	0.204	
		suddenly brake	0.163	
	C3.bad attitude	pass stop without stopping	-0.291	0.306
		drive before people sit down	0.660	
		catch up schedule with high speed	0.289	
		unconcern	0.239	
		bad answer to passenger	-0.190	
		all are passengers' fault	0.073	
		drive fast when getting off	-0.015	
	C4.hardware poorly maitained	umcomfortable single seat	-0.241	0.369
		screen flicker	0.394	
		no regular maitenance of old	-0.408	
		off bell fault	0.073	
		aesthetic damage by many daub	0.186	
		scrolling text marquee fault	-0.424	
		R = 0.530	K=2.957	
		R²= 0.282		

4-3-4 Fatigue

The item "un-safety driving (0.657)" with the highest correlation coefficient and it should results in arousing the sense of fatigue. Besides, the category "suddenly brake (0.470)" with highest and positive score could be the main feature making people feel fatigue and the multiple correlation coefficient in table is 0.716, the coefficient of determination is 0.512, as shown in Table 4-5.

Table 4-5 result of fatigue analysis

Abstract feeling	item	category	value	coeffient
D.fatigue	D1.management problem	out of schedule	0.469	0.457
		late when it rain	0.452	
		many buses come in the same time	-0.038	
		pass stop without stopping	-0.399	
		payment problem	0.733	
		small bus for lots people	0.207	
	A2.un-safety driving	catch up schedule with high speed	0.106	0.657
		easy to fall down	-0.804	
		drive before people sit down	-0.684	
		turn a corner with high speed	-0.422	
		bad gear skill	-1.347	
		suddenly brake	**0.470**	
	D3.bad attitude	pass stop without stopping	0.229	0.525
		drive before people sit down	1.920	
		catch up schedule with high speed	-0.279	
		unconcern	0.557	
		bad answer to passenger	-0.197	
		all are passengers' fault	-0.256	
		drive fast when getting off	0.535	
	D4.other passengers' effect	using phone with high volume	-0.514	0.468
		fight for boarding/getting off	0.263	
		noise	-0.449	
		fight for the seats	0.537	
		no yield seats to elderly people	0.274	
		priority seats are not enough	0.049	
		smell bad	-0.397	
		stuck in the middle of bus	-0.250	
		R = 0.716	K=3.472	
		R^2= 0.512		

4-3-5 Disappointment

The item "management problem (0.488)" with the highest correlation coefficient and it should results in arousing the sense of disappointment. Besides, the category "out of schedule (1.742)" with highest and positive score could be the main feature making people feel disappoint, and the multiple correlation coefficient in table is 0.566, the coefficient of determination is 0.320, as shown in Table 4-6. The item "other passengers' effect" has a close coefficient, the item also was considered in the later discussion section.

Table 4-6 result of disappointment analysis

Abstract feeling	item	category	value	coeffient
E.disappointment	E1.management problem	out of schedule	1.742	0.488
		late when it rain	-0.416	
		many buses come in the same time	0.077	
		pass stop without stopping	-0.554	
		payment problem	-0.336	
		small bus for lots people	0.335	
	E2.other passengers' effect	using phone with high volume	-0.827	0.468
		fight for boarding/getting off	0.406	
		noise	-0.050	
		fight for the seats	-0.656	
		no yield seats to elderly people	-0.696	
		priority seats are not enough	0.817	
		smell bad	-0.317	
		stuck in the middle of bus	0.620	
		R = 0.566	K=3.032	
		R^2= 0.320		

In brief, in this section the correlations between service features and emotions were delivered. In the next chapter, the context between each item would be explained and discussed.

4-3-6 Brief summary

Quantification theory type I analysis was applied for 5 times for each abstract feeling, and it was presented by the EGM diagram again. Figure 4-5 shows the correlation diagram from the above results. Each negative stimulus has the highest correlation with the negative emotion and concrete feature. Besides, the sense of afraid and fatigue had the same original evaluation, un-safety driving. This diagram can provide us with a quick way to understand the problems and effects in bus service. Not only to put the focus in the highest value of the list of concrete feature, but to consider the second highly value, it can help us learn more from the result and realize another feature ignored by us.
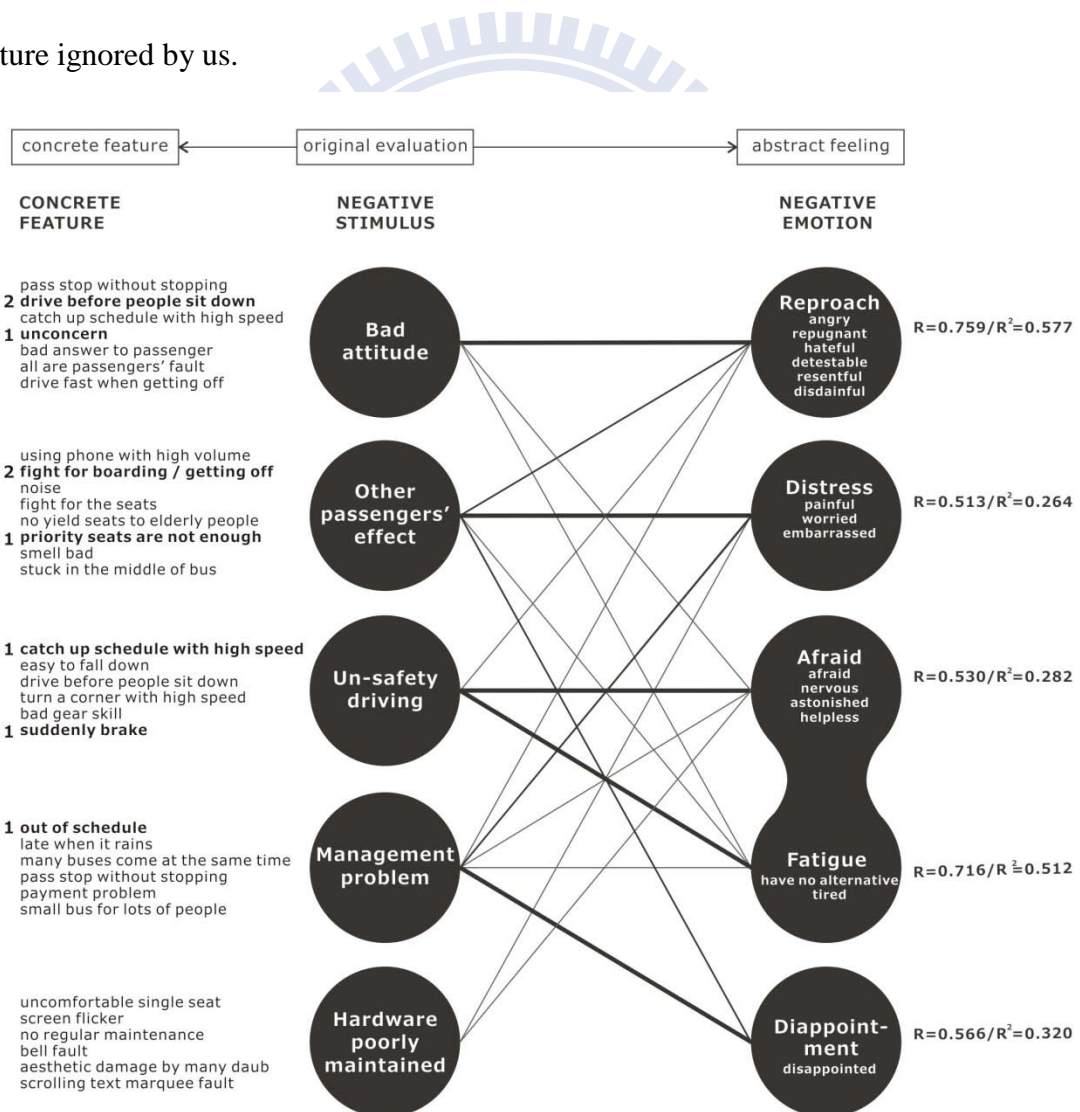
Figure 4-5 the Hayashi's quantification theory type I analysis by EGM diagram

4-4   Core pattern of passage

According to the grounded theory, there is no difference in value between a researcher's own thoughts and notes, video footage, or remarks made by a user. They are all useful and can be used in the whole process. Thus, everything is data.

4-4-1   Open Coding

All codes were printed out and clustered again. By the process of conceptualization, the category labels were named and explored the properties under each code. In addition, according to the context of codes, dimensions of property were performed. Table 4-7 performs all possible categories in a detail description.

Table 4-7 the result of open coding

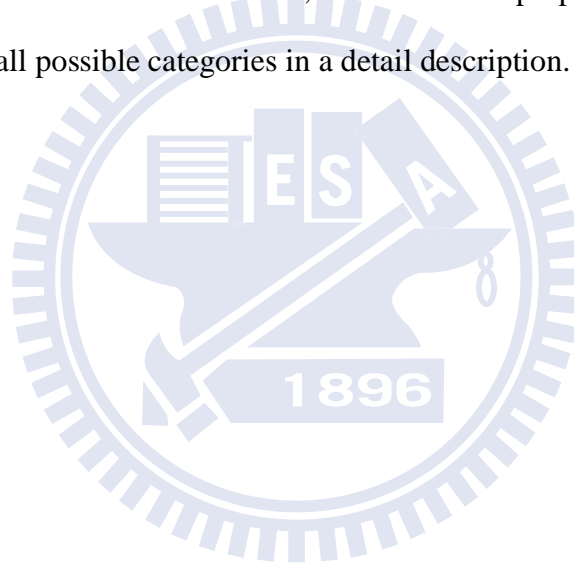| super-category	category	properties	dimensions
Seed inner peace	get used to something	time	long / short
	reaction	integrity	high / low
		advanced time	long / short
	observation	frequency	high / low
		time	long / short
		level	detail / normal
		range	near / far
	speculation	context	cause / result
		resource	exp / non-exp
	expectation	expected time	long / short
		certainty	sure / not sure
Stimulus	external impact	impact level	high / low
		time	long / short
		resource	artificial / natural
	implication	impact level	high / low
		obvios level	high / low
		frequency	high / low
		result	positive / negative
Period	peak period forming	time	long / short
		timimg	peak / out of peak
		level	high / low
Fatigue	tired	time	long / short
		relax level	high / low
		tolerance	high / low
	have no alternative	type	sudden / routine
		blame target	self / others
		level	high / low
	mental pressure	resource	self / others
		control	high / low
		impact part	physiology / behavior
Hurt(damage)	invasion	level	high / low
		careness	high / low
		time	long / short
	danger	cause	self / others
		hurt part	mental / body
		level	high / low
		time	long / short

		way	suitable / unsuitable
out of control	individualism	influence	much / few
		range	many people / personal
		body touch	yes / no
	gap	attitude	passionate / apathy
		time	long / short
		tolerance	high / low
expression	complain	way	anonymous / real time
		time	long / short
		content	self / others
unpredictability	contradition	level	high / low
		impact level	high / low
		reality	one's fault / both fault
	random	level	high / low
		frequency	high / low
		impact level	big / small
	misunderstanding	clearity	high / low
		impac level	self / others
		range	partial / all
	umfamiliar	familiar level	high / low
		look for help	yes / no
reference	dressing standard	level	high / low
	desire to travel	level	high / low
Strategy	blame in the heart	level	high / low
		target	human / artifact
	regret	time	long / short
	accept	target	human / artifact
	far away	target	human / artifact
		level	high / low
	wait for end	tolerance	high / low
		time	long / short
	avoidance	level	high / low
	consider for others	level	high / low

4-4-2 Axis Coding

From Table 4-7, there were many categories could be linked because of their roles. In order to select several meaningful phenomenon, categories were linked in logical ways, such as shown in Figure 3-12. Table 4-8 lists the phenomenon found by axis coding phase. The categories listed by the way of open coding were connected with casual relationship. The following Table 4-9, 4-10, 4-11 indicate that the context of phenomenon which were explored from causal condition to result.

Table 4-8 the phenomenon found by axis coding

causal condition	phenomenon	context	intervening condition	action strategy	result
Unpredict-ability	Control situation	...	unfamiliar ... endless stimulus suddenly event	speculate prediction expect	continued stimulus...
Stimulus, hurt	Adjustment	...	other tools weather accident company rule	departure early avoidance info collection counting...	change... ineffective
Fatigue, period	Adaption	...	suddenly event self-justice self-value time pressure ...	become negative being used to pretend nothing... self-restrict	stereotype forming

a. Control situation

Table 4-9 performs that when participants sought for the ease, endless stimulus always appeared suddenly at the same time. In the probing document, participants usually mentioned the cause or result they guessed and speculated, and those actions and stimulus almost were happened at the same time. All the process was endless observation and speculation. Besides, people speculated everything depend on their physical feelings, interactive recognition, time perception, and some objective clues. There was no doubt that the difference between reality and their speculation would become the action / interaction strategy for the next step.

[Quote 01]

「*It was pretty early to leave home, shouldn't being late to office. But it took so much time to wait the bus, I don't know when it comes, because I often waited over ten minutes, and it resulted in being late to office. When the MRT open, I'd rather take that.* 」*(participant_G)*

「*Get on the bus at the normal time. Although it doesn't crowded inside, but there are few people stand there. But last time, I thought I was sleepy because there were few people inside; however, it scared me, that is the worst economic period...* 」*(participant_J)*

「*The most hated thing is that waiting for no bus of mine coming, but see the other bus come across. When the bus comes with the second bus, it makes me to doubt there are many problems in management.* 」*(participant_K)*

「*When I went out from the corner, there was nobody there, I guess the previous bus just left...so it need to wait for a long time. At the same time, I was worried about the time that bus comes, this situation make me feel anxious, because sometimes the bus comes fast, sometimes not...* 」*(participant_E)*

Table 4-9 the phenomenon of control situation

causal conditions→		phenomenon→	
unpredictability, out of control		control situation	
properties→		**special dimensions→**	
contradition		continued time	long
random		frequency	high
misunderstanding		comprehension	low
gap		ask for help	no
		timing	random
		desire	strong
		concern level	high
		perception	low
context→			
The phenomenon of "control situation" was happened under the following conditions : when people in a unpredictable situation with radom stimulus, and it is difficult to understand the environmental information and have a strong desire to seek inner peace.			
action / interaction strategies→			
speculate the cause			
guess the result			
expect the time			
realize situation			
intervening conditions→			
umfamiliar to environment			
endless stimulus			
suddenly event			
result→			
continuous observation			
stimulus coming			

b. Adjustment

Table 4-10 describes that how passengers adjusted when they met stimulus.

During the process of interview, subjects usually mentioned that they came out some reaction strategies if they had negative experience. It meant those negative stimulus could be reduced or eliminated; however, not all situations would be like that, it was depended on users' abilities, because they always adjusted themselves from their behaviors. In brief, before arousing negative emotions, users evaluated their ability of react the stimulus, and it was the first step when people adjusted themselves. For instances, wearing high-heals is difficult to stand in the bus, some participants changed their dress if they need to take the bus. But if they still wanted to wear high-heals, they chose change other transportation or tried to tolerant in the dangerous bus. The other example is that sometimes people are proud of what they did for adjusting the stimulus environment.

[Quote 02]

「*Traffic jam! It is easy to see this scene when it is peak time. Maybe the original 30-minutes-long would pull off to 50-minutes-long, it wastes so much time and next time need to get up early.*」 *(participant_D)*

「*When it is rainy, the bus always wet and dirty…sometimes, my feet and pants get wet by other people's wet umbrella. It made me so angry, why do they not to close their umbrella? Like my umbrella which is automatic one, it doesn't make others wet.*」 *(participant_A)*

「*The road in front of the bus stop is difficult to cross, many people (include me) cross the road ignoring the traffic light, it is so dangerous but it really rush…*」 *(participant_D)*

Table 4-10 the phenomenon of adjustment

causal conditions→		phenomenon→	
stimulus, hurt		adjustment	
properties→		special dimensions→	
external impact		past exp	yes
implication		info control	low
invasion		impact level	strong
danger			
context→			
	The phenomenon of "adjustment" was happened under the following conditions : it is difficult to control the situation, even though people had have past experience, and usually the impact was too strong to afford.		
action / interaction strategies→			
departure early			
avoid peak period			
info collection			
counting time			
intervening conditions→			
accident			
other tools			
bad weather			
company rule			
result→			
change the situation			
ineffective			

c. Adaption

Table 4-11 presents that adaption was triggered by the sense of fatigue. This phenomenon appeared in interview and probing document, participants reduced their value standards, because of self-factories, time pressure, and negative emotion forming. It was easy to feel fatigue when experiencing long term action / interaction. Then, facing some objective negative stimulus didn't have any active reactions by people who experiencing stimulus into stereotype. The desire to be relieved would be

eliminated little by little with the influence between stimulus and fatigue.

[Quote 03]

「*The time table of bus is not accurate, although it wrote 10 minutes per bus, sometimes I waited for 20, 30 minutes…even 1 hour, fortunately, that time is the time to go home…*」 *(participant_J)*

「*There is no return small money, it is very unreasonable. If the ticket is NT 15 dollars, but you only have 2 coins of 10 dollars, you have to donate the rest 5 dollars to driver…*」 *(participant_H)*

Table 4-11 the phenomenon of adaption

causal conditions→		phenomenon→	
fatigue, period		adaption	
properties→		special dimensions→	
tiredness		cumulative time	long
have no alternative		frequency	high
mental pressure		value standard	go down
periodic		stereotype	existed
		passion	lack
		spirit	bad
context→			
The phenomenon of "adaption" was happened under the following conditions : people who suffered from accumulated pressure and many stimulus, usually own lower value standard, and lack of passion.			
action / interaction strategies→			
become negative			
being used to			
pretend nothing happened			
self-restrict			
intervening conditions→			
suddenly event			
self-justice			
self-value			
time pressure			
physical and psychological condition			
axis coding story→			
stereotype forming			

4-4-3 Selective Coding

Only when the phenomenon was connected, it was possible to indicate the change of conditions. Therefore, they were generalized into a complete pattern from the point of causality and the concept of process. This linking of sequences was accomplished by the notion: (a) the change in conditions influencing action / interaction over time; (b) the action / interactional response to that change; (c) the consequences that result from that action / interactional response; and finally by (d) describing how those consequences become part of the conditions influencing the next action / interactional sequence. (Strauss & Corbin, 1990) Moreover, the whole pattern was done by the notion of appraisal theory and the representative phenomenon which linked the others. Figure 4-6 illustrates that the concern of seeking inner peace and negative stimulus had been competing with each other, and the emotions were elicited by the appraisal system. As a result, the action / interaction strategies were proposed for change the situation. If the strategies were invalid, people adapted the situation. And the result was the stereotype formed in people's mind.
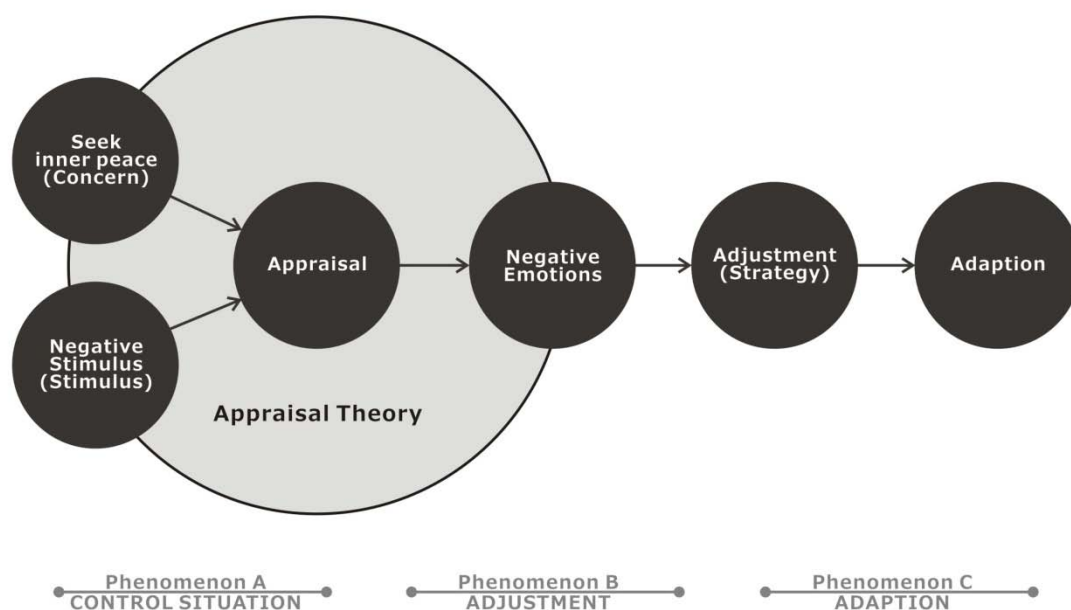

Figure 4-6 the core pattern of controlling situation

4-4-4　Brief summary

By the process of grounded theory, the data was narrowed down little by little. Lots of meaningful categories were found through the way of open coding, and several axis phenomenon were presented by combining the categories. Finally, according to the appraisal theory, the production of negative emotion was not only elicited by external stimulus, such as concrete features, but the inner concern of passengers should be treated as equally important. This research concluded that passengers have the concern of seeking their inner peace to compete with the coming stimulus, and the emotions would elicited by the appraisal system. Besides, facing the negative emotions, passengers have their own strategies to adjust the situation in order to change their mind into peace. Passengers have a high possibility to adapt the whole passage with the cumulative time, and this kind of pattern is continued played in the negative emotional experience when taking bus.
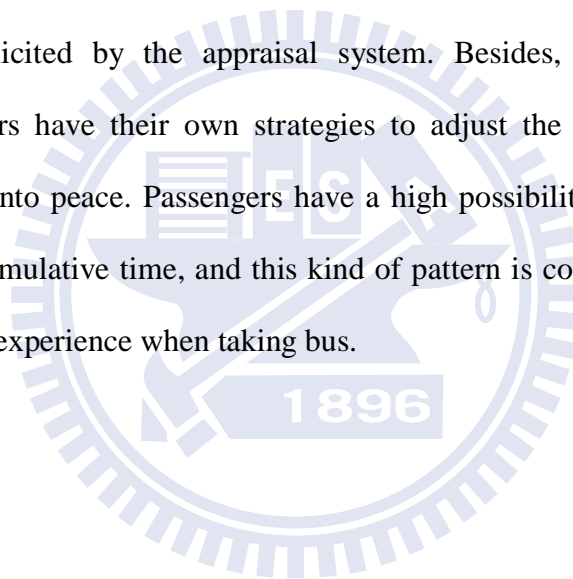
Chapter5 Review and Discussion

In the previous chapter, results about the analysis of bus experience, emotions aroused by stimulus and the core pattern of phenomenon were delivered. In this chapter, issues to design suggestions were proposed for discussion. And it was divided into four parts to discuss. First, strengthening the integrity of context was discussed, and four main contexts of emotion aroused were delivered. Second, the action / interaction strategies of adjustment were presented and the main strategies would be described. Third, a model of negative emotion was established by the basis of above discussion. At the end of this chapter, the suggestion for the design implication was proposed. Figure 5-1 shows four parts of discussions, which was based on the core pattern.
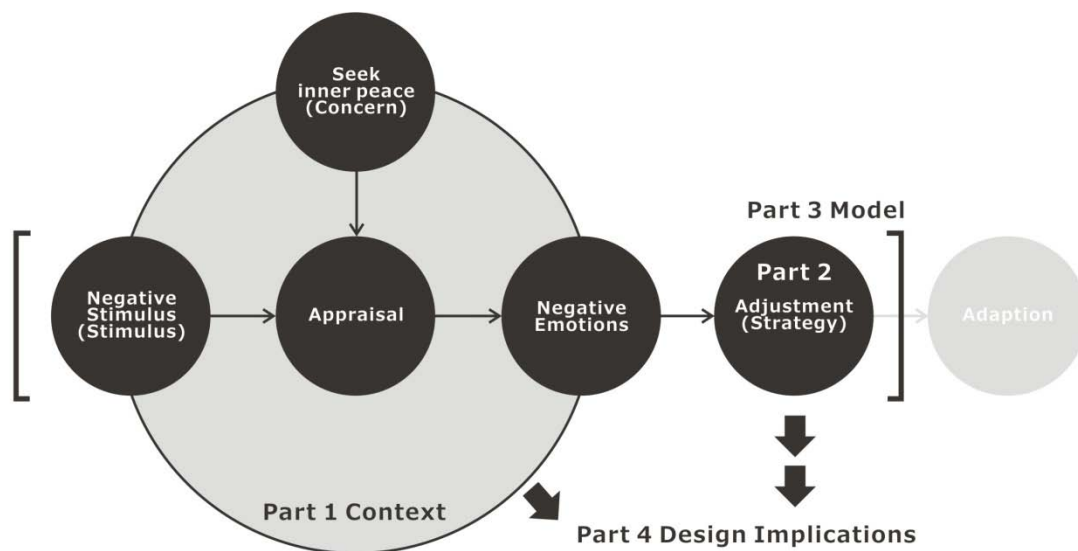
Figure 5-1 four parts of discussions according to the model of core pattern

5-1 Context of Appraisal

According to the results of correlation between negative emotions and stimulus, in this section, the context of appraisal was further explored. In order to create a better user experience, Norman(1998) also pointed out in-depth understanding of context is the key to achieve this objective. And it is important that designers should consider the relationship between user desire, interactive environment, and function. Therefore, a new design or experience could be proposed with the notion of user-centered design. Figure 5-2 presents a brief diagram of relevance from Figure 4-5.
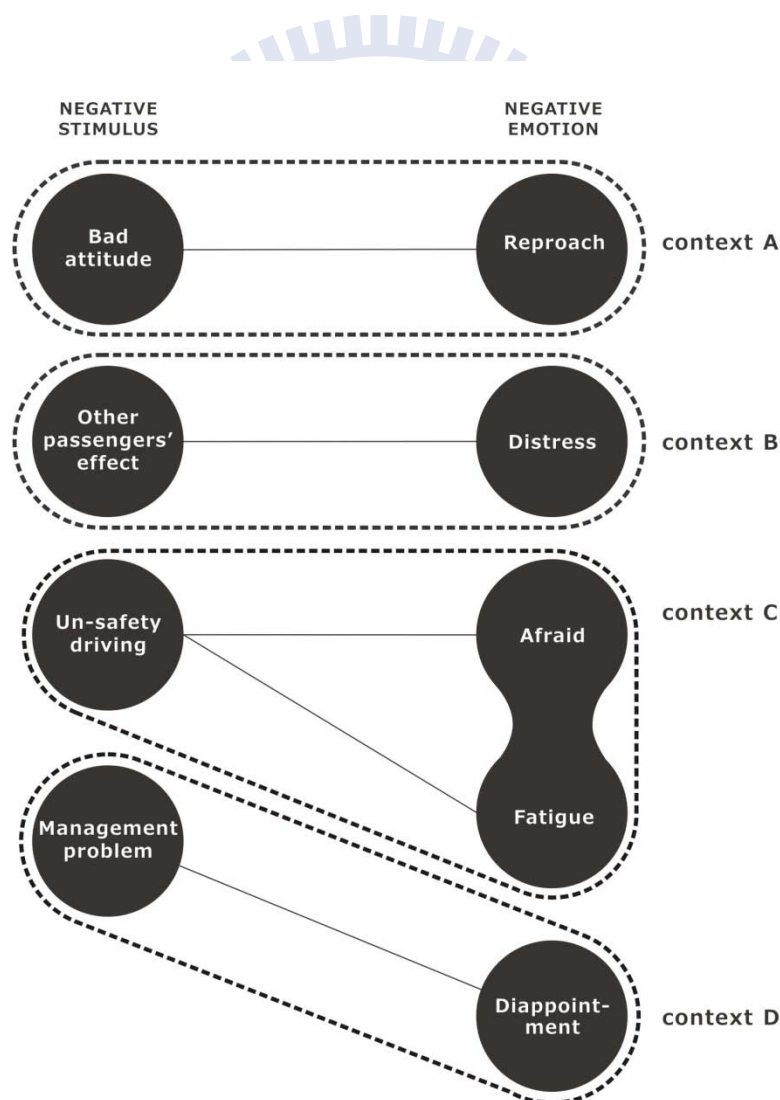
Figure 5-2 the brief diagram from the quantification theory type I analysis

Context A: Reproach was elicited by driver's bad attitude.

5-1-1 The feeling of driver's bad attitude was resulted from intervening conditions.

From Figure 5-2, it shows that reproach was mainly elicited by driver's bad attitude. Beginning our discussion by reviewing original document aims to find out the intervening conditions of appraisal; however, there were still many potential factors behind driver's bad attitude. For instance, the driver became impatient because passenger's slow motion caused by the hardware failure. As a result, what made driver in bad attitude also should be concerned. From the quotation by participant B and above examples, it could be inferred that the problem of tangible device, reflection from intangible service, and personal reason may also result in the fact that passengers feel bad manners of the drivers. In brief, those intervening factors found not only had us notice the relationship of results, but learn the context from above interpretation. Figure 5-3 illustrates that the intervening factors were presented by interpreting the context of appraisal and the influence from other passengers.

Besides, participant K said that the other passengers could be a trigger to make them nervous, because others' negative emotions were elicited by personal delay. This kind of phenomenon also was concerned by universal design (Nakagawa, 2006).

[Quote 04]

「*When it time to pay, I can't find my wallet, the driver in a impatient attitude and said "why don't you take out your wallet early?"The feeling was so terrible at that moment.* 」*(participant_D)*

「*Meet a driver with bad attitude, he was so angry and ignore my question about the ride. I was not only angry, but too anxious to take the right bus.* 」*(participant_D)*

「*When I got on the bus and pay by my card, sometimes the card was broken, unfortunately, there were many passengers wait after me, I got very sorry. If the driver looked so impatient that my mood would be affected…* 」*(participant_K)*

「*Driver closed the bus door fast, just after passenger leaving, it is so dangerous and make me feel the driver was impatient…* 」*(participant_B)*
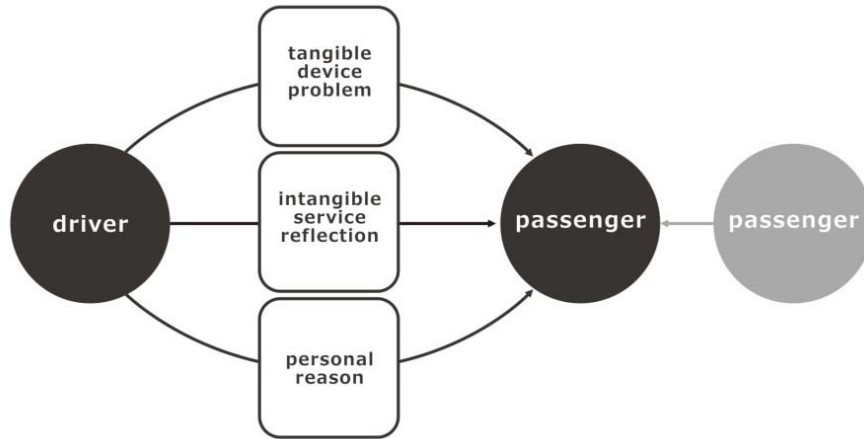
Figure 5-3 the intervening conditions between driver and passenger

Context B: Distress was elicited by other passengers' effect.

5-1-2 Influence from the other passengers and passengers own value are highly related.

Figure 5-2 shows that the sense of distress aroused by the other passengers' effect. There were many kinds of effect from others, such as making noise, inappropriate behaviors, dilemma between morality and self, etc. It can be divided into two perspectives. One is physical feeling, the other is mental perception. However, sometimes both aspects may conflict with each other. For example, because of the sense of morality to have people offer their seat to elders, but it was a dilemma when they were tired. Personal value and sense not only affected people's behavior but also indirectly affected their emotions. Overall, in addition to concerning about emotional impact from driver, designers should put more emphasis on understanding personal sense and values, such as empathy, morality, sense of justice, etc. Figure5-4 illustrates that the emotion elicited by others' effect was assessed by personal values, and the lightning sign meant some conflict.

[Quote 05]

「It time to being late to office, unfortunately, there are many many elders take many thing get on the bus at this station… 」(participant_C)

『*It time to go home, I am so tired and need a seat. But when bus passes the Long-shian temple, there are many elders get on, should I yield my seat to them? It take 50 minutes to my home, and it is so tired if I stand, but I can't feel good in mind when I sit, it is kind of dilemma...*』*(participant_D)*

『*Because of my shyness, I don't like the couple student do some intimate actions, and almost ignore others sight on them...*』*(participant_H)*

『*There was a stupid person in my way home, he used his mobile phone with high volume, the content was about coding...! It sounded he was so proud of himself...I was so tired because of the whole day working, hearing his big voice made me feel headeache...*』*(participant_B)*

『*Today is a small bus, a little crowded, but I still sat nearby side way. The person who sit with me can't go out front of me...and the other passenger was eager to get in, the bag hit on my face, and that person didn't notice that...I was unlucky! And I don't like to take small bus, it is big rock...*』*(participant_D)*

『*There was a elder people with sticker got on the bus, I stood up right away and say "this seat is for you", but there also was a lady put her leg in to strike the seat! Then I stared at her ! That elder said "It is ok, I will go to the back seat", "there is no seat!"I said. As the result, that lady gave up to strike...It was really shame on office lady...*』*(participant_B)*
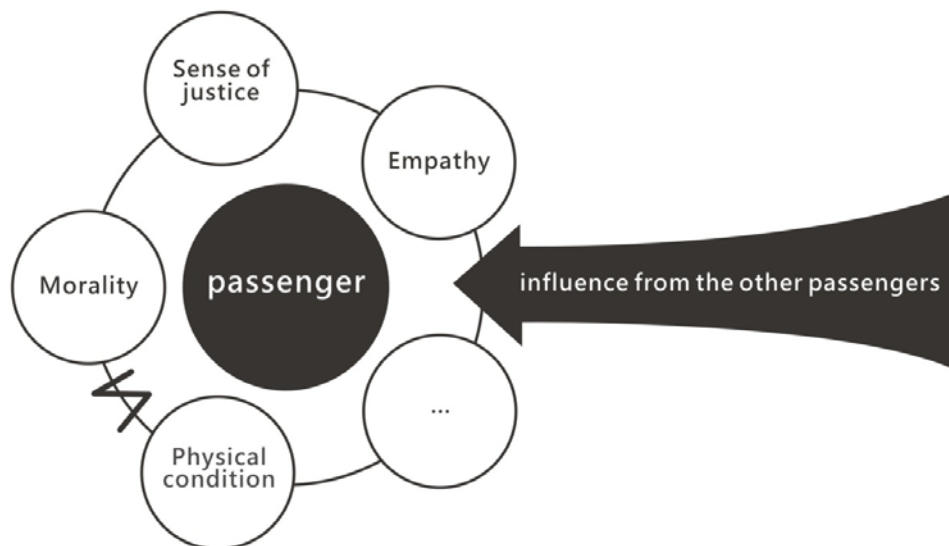

Figure 5-4 the relationship between passenger's value and external influence

Context C: Afraid and fatigue was elicited by un-safety driving

5-1-3 When passengers distrust the service, they have to control the situation by themselves.

According to Figure 5-2, it indicates that the sense of afraid and fatigue were aroused by the same stimulus, un-safety driving. And there was no doubt that passengers felt

afraid when life was threatened by dangerous driving. In fact, many participants mentioned that dangerous driving was regarded as bad skill and attitude of driving. Take participant A for example, she doubted the training quality of being a bus driver, because she thought the driving skill and attitude was so bad. Hence, participants always raised their awareness to check current situation and seize the rings tightly. Figure 5-5 indicates that passengers had a desire to "control" the situation to avoid injury. On the other hand, they had already passed a tired day, so it was easy for them to get a fatigue which combined with physical and psychological bad feeling.

[Quote 06]

『*Some drivers drive very fast and dangerous, it is hard to stand, and the hand would be hurt by hanging the ring so tightly. Moreover, sometimes rings were not enough for many passenger, I am really worried about fall...*』*(participant_D)*

『*The bus was in a big rock, the driver's skill was so terrible, just like other car hit the bottom of bus...how it would be when there were elders on board...*』*(participant_D)*

『*I was sit near driver, I found that he didn't keep a safe distance with the front car. He prepared to brake when the distance was so close, it so nervous! ...I can't imagine that if the bus hit the front car.*』*(participant_D)*

『*Driver didn't think for the crowded, suddenly fast and suddenly slow...it swayed very big when I wore my high-heal...I had to grasp the ring tightly, and it was so tired that I can train my muscle...*』*(participant_A)*

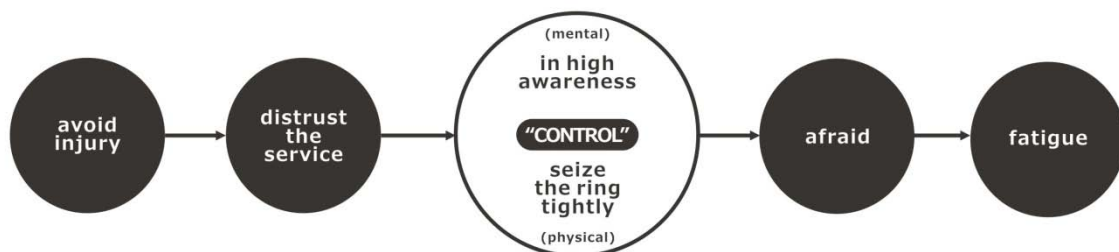『*Don't they have a exam to hire a driver? Why the skill is so poor??*』*(participant_A)*

Figure 5-5 the passage of controlling situation

Context D: Disappointment was elicited by management problem.

5-1-4 Passengers have prior expectation before they enter the service.

From Figure 5-2, the sense of disappointment was aroused by management problem. Many participants, such as C, A, and H, they often see the bus leave, even though they had have past experience, it was still difficult to predict the bus. Besides, Tse & Wilton (1988) also pointed that consumer satisfaction is the difference between prior expectations and actually perception. Figure 5-6 shows participants have prior expectations before they entered the service. That's the reason why they felt disappointed.

[Quote 07]

「*My house is near the bus stop just for 3 minutes, but it still makes me disappointed when I see the bus passing by...or I shake my hand hard, but the bus doesn't stop...(cry)* 」 *(participant_A)*

「*When I went to the road in front of bus stop, I saw the bus stop and leave...Orz* 」 *(participant_C)*

「*The most hated thing in the bus is to see the same number bus passing by your side...especially, you are in a crowded and that is empty and fast, it is pretty unhappy...* 」 *(participant_K)*

「*Perhaps Si-chu is so far that the timetable of bus seems to very unstable. And if I miss this bus, I have to wait for 20 minutes...* 」 *(participant_H)*

「*Even though I had past experience to speculate the bus, I still can't to know when it comes?...Although there is a time table on the stop, but never on time, because drivers are different...* 」 *(participant_H)*
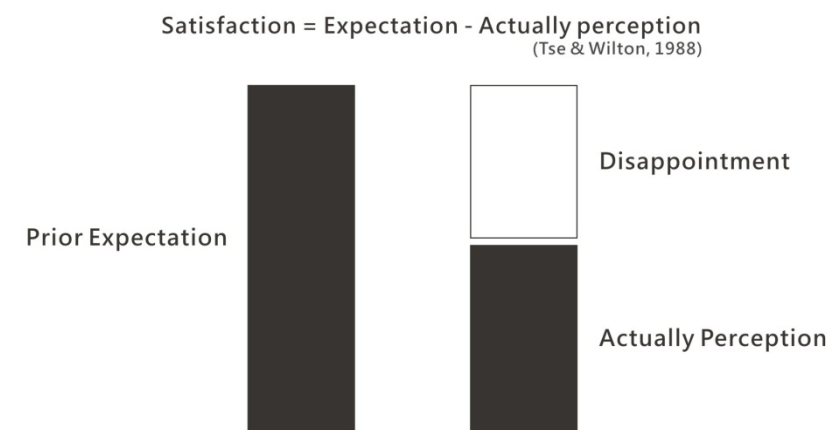

Figure 5-6 the relationship between expectation and perception

5-2 Emotional response

In chapter 4, the core pattern of negative emotional experience was delivered. By the pattern, understanding the strategies of adjustment was helpful for participants to response the situation. Therefore, in this section, going back to the data and check all emotional responses again.

5-2-1 Action / interaction strategy

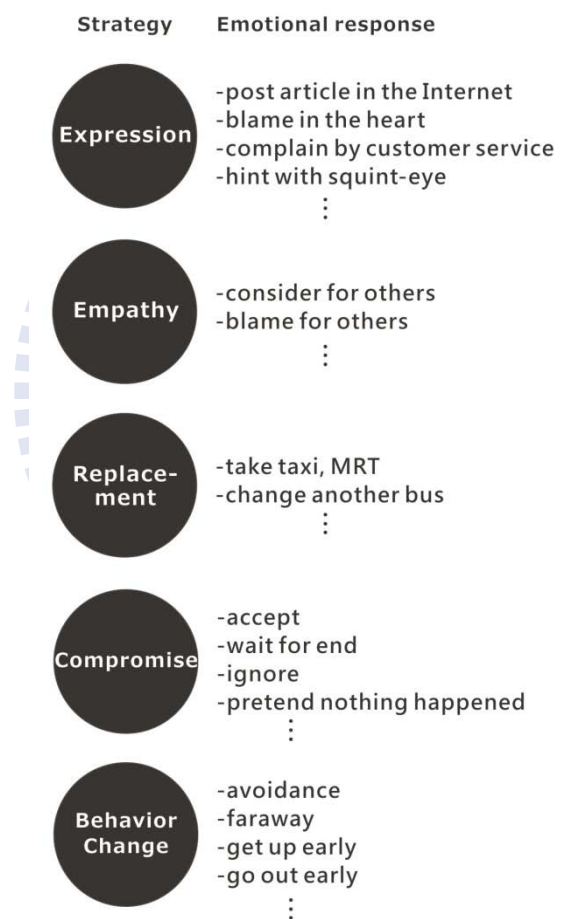Emotional responses were paired and combined into strategies as follows Figure 5-7:

Figure 5-7 five action / interaction strategies

Expression

Participants often blamed the service in heart, complained the bus service through customer service, and posted their disappointments in articles on the BBS (Bulletin Board System). Obviously, they need an appropriate channel for emotional release.

Moreover, when it comes to emotional release channel, BBS is the most popular channel to do it, where a variety of people gather showing another sub-society. For example, when participant B experienced a very terrifying event, she'd like to post her emotional article on the BBS, and also received many people's sympathy and encouragements. Compared with the existed customer service, it seems that people need greater freedom to express and release their opinions and emotions.

[Quote 08]

「*Today morning still very crowded, and here comes a elder who seems unfamiliar with the road...the driver didn't drive and insist that the elder should move her body (Is driver blind?) Finally, the elder are forced to get off, and I write down the driver's name to complain by the customer service, is that valid?*」*(participant_B)*

「*After came across this kind of event, I described the event and post on the BBS and my blog, there were many people replied me..."Let me protect you, kill him..."they replied...*」*(participant_B)*

「*I am a office worker, it is all right if you just delay 5 minutes, but it doesn't like that, you are singing and the small motorcycle even passes by us, I am heart-break, damn! I am late!*」*(participant_D)*

「*I can't do anything but blame in the heart...*」*(participant_H)*

Empathy

Many participants mentioned that the concept of "think for others", "why does not she consider for others?", this is called empathy. This term, according to Koskinen (2003), is an imaginative projection into another person's situation". And this action can be discussed from two aspects. First, negative emotion is aroused by participants' empathy, because they doubt why others do not have empathy. For instance, participant B got angry was because other passengers did not yield their seat to elders. On the other hand, when facing others' effect, participant A changed her later behavior because of empathic thinking; to take another example from standing in line, participant K mentioned the proceeding was slowed down by a passenger who was finding wallet, she understood that person's situation and hence did not care about the delay.

「*Don't you think about the elders in your family when you don't want to yield your seat?*」 *(participant_B)*

「*The smell of others' perfume was super uncomfortable, therefore I would use fewer perfume, because I know I would be blame by others....*」 *(participant_A)*

「*When I saw the driver treated elders in a bad way, I felt sad for him, and I was really reluctant to see this thing...*」 *(participant_B)*

「*Driver passed the stop in purpose because of the elders...usually I would send the letter to the customer service because I know his name...*」 *(participant_K)*

「*Someone met the problem that machine was broken, it was very sorry for the people behind...but if we can consider for other's situation, that's allright...*」 *(participant_K)*

Replacement

According to the statements from participant A and K, they had ever changed other transportation because they didn't want to afford the impact from waiting. The reasons, such as rainy day and late for company, may have people to take taxi, MRT, or another different bus services. Obviously, it would be a way to release passenger's negative emotion by changing the situation. When people had reached a particular point-in-time, they may choose not to keep waiting and anxious but find another way. It seems a better way to release emotion rather than suffering from such situation.

「*Taking bus just like a gamble...*」 *(participant)*

「*If the time was hurry, I would take MRT...*」 *(participant_A)*

「*Sometimes it was not a rule that going to bus stop early would take the bus fast...it made me angry...so I turned to take taxi...*」 *(participant_K)*

「*The longest record was waiting for 40 minutes, I'd rather walk back home...*」 *(participant_D)*

Compromise

There were many events that participants thought they were normal, but actually they are not really. Passengers had no alternatives to change the environment, and they tend to accept certain situations, such as participant A, who hated drivers' bad manner but still accepted it as a normal event. Perhaps they felt fatigue when had experienced

a long-term and repeated stimulus. Then, some other negative stimuli do no have any effect on people due to the formation of these stimuli into a stereotypical feeling for every time passengers are on the bus. For instance, participant K had a stereotype that she can do nothing to change the situation but to wait till the end of stimulus. It seems quite passive.

[Quote 11]

「*Get on the bus at the normal time. Although it doesn't crowded inside, but there are few people stand there. But last time, I thought I was sleepy because there were few people inside; however, it scared me, that is the worst economic period...*」*(participant_J)*

「*There is no return small money, it is very unreasonable. If the ticket is NT 15 dollars, but you only have 2 coins of 10 dollars, you have to donate the rest 5 dollars to driver...*」*(participant_H)*

「*Although I think this kind of driver is bad, drivers do not always like that?*」*(participant_A)*

「*There are so many people, it is so crowded that I am uncomfortable. To wait some stations to see if it will be better?*」*(participant_K)*

Behavior change

Participants usually mentioned that they would change their behavior to fit the situation. It means they avoid the impact from negative stimulus by changing themselves; however, not all situations would be like that, it depends on the passengers' ability. For instance, participant A said that wearing high-heals was difficult to stand on the bus, and therefore she took the action to change her dress while taking a bus. But if she still wanted to wear high-heals, she would change other transportation or choose to take bus in certain period of a day when most seats are available. Besides, sometimes participant was proud of what she did for adjusting the problem she met.

[Quote 12]

「*When it is rainy, the bus always wet and dirty...sometimes, my feet and pants get wet by other people's wet umbrella. It made me so angry, why do they not to close their umbrella? Like my umbrella which is automatic one, it doesn't make others wet.*」*(participant_A)*

「*The bus was rush and fast, I was worried about the safety, so avoided to wear high-heal.*」*(participant_A)*

『*In order to avoid looking for payment and fall on the bus, I would prepare my easy card early! And when I stand in line to get on, I would avoid stand at the last one...*』*(participant_B)*

Because users are creative, understanding and learning whole user context could have designers with empathy to design. On the other hand, they also need empathic understanding of the user. (Koskinen, 2003)

5-2-2 To link the strategies and context

In order to establish a completed contextual model of negative emotion, the relation between each factor was examined. Table 5-2 presents that under the main context of appraisal, the strategies were found by contextual review. As a result, the correlation was linked.

Table 5-1 strategies under the context

number	simulus	emotion	emotional response	quote
A	bad attitude	reproach	accept / blame / complain by customer service	13
B	other passengers' effect	distress	accept / behavior change /blame / wait	14
C	un-safety driving	afraid / fatigue	far away / wait / consider for others / pretend not to know / blame	15
D	management problem	disappointment	regret / behavior change / use alternative way	16

[Quote 13]

『*Although I think this kind of driver is bad, drivers do not always like that?*』*(participant_A)*

『*The driver ignored me, so I had to ask other people. But I can't fight with him, I just blame in my heart.*』*(participant_B)*

『*Driver passed the stop in purpose because of the elders...usually I would send the letter to the customer service because I know his name...*』*(participant_K)*

[Quote 14]

『*Don't you think about the elders in your family when you don't want to yield your seat?*』*(participant_B)*

『*I just see him with a squint-eye, because I can't abandon other to do something...*』*(participant_B)*

『*The person sit nearby me smell so terrible, I can't help but change my seat...*』*(participant_A)*

『*There are so many people, it is so crowded that I am uncomfortable. To wait some stations to see if it will be better?*』*(participant_K)*

『*Someone met the problem that machine was broken, it was very sorry for the people behind...but if we can consider for other's situation, that's allright...*』*(participant_K)*

「*It was noisy, I wear my ear-phone then turn the volume high…*」*(participant_A)*

「*When it is rainy, the bus always wet and dirty…sometimes, my feet and pants get wet by other people's wet umbrella. It made me so angry, why do they not to close their umbrella? Like my umbrella which is automatic one, it doesn't   make others wet.*」*(participant_A)*

[Quote 15]

「*When I stood, I really hated the driver, because you don't when would be crashed.*」*(participant_H)*

「*The bus was rush and fast, I was worried about the safety, so avoided to wear high-heal.*」*(participant_A)*

「*In order to avoid looking for payment and fall on the bus, I would prepare my easy card early! And when I stand in line to get on, I would avoid stand at the last one…*」*(participant_B)*

「*There are so many people, it is so crowded that I am uncomfortable. To wait some stations to see if it will be better?*」*(participant_K)*

「*Although I think this kind of driver is bad, drivers do not always like that?*」*(participant_A)*

[Quote 16]

「*Every time I saw the bus left in front of me. There was an underground passage, if I walked in then when I walked out the bus would come. If I walked the ground, it was not enough time, this is what I want to show off.*」*(participant_C)*

「*My house is near the bus stop just for 3 minutes, but it still makes me disappointed when I see the bus passing by…or I shake my hand hard, but the bus doesn't stop…(cry)*」*(participant_A)*

「*Sometimes it was not a rule that going to bus stop early would take the bus fast…it made me angry…so I turned to take taxi…*」*(participant_K)*

「*Sometimes I would regret that why I didn't leave house early and why I did so much things…*」*(participant_A)*

5-3   Model of negative emotional experience

From above discussions, different emotions could be aroused by different stimulus, and different negative emotions should be reduced or eliminated in different ways (passengers' action / interaction strategy). The relationship can be linked, and finally the model was built by the previous discussions, as shown in Figure 5-9. Figure 5-8 shows the resource of the model building.
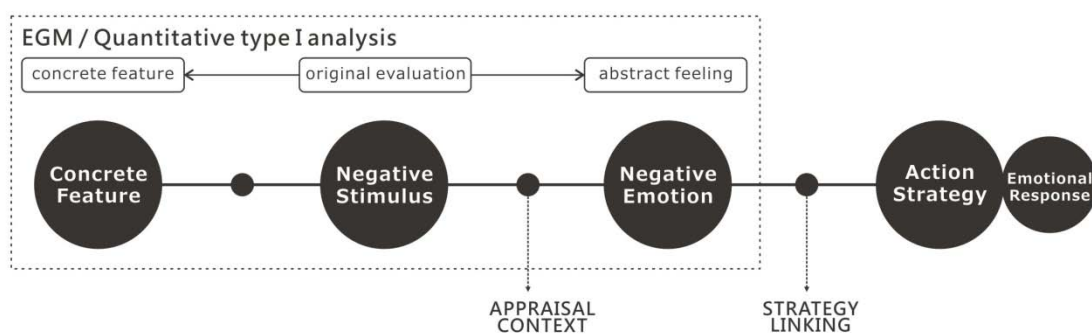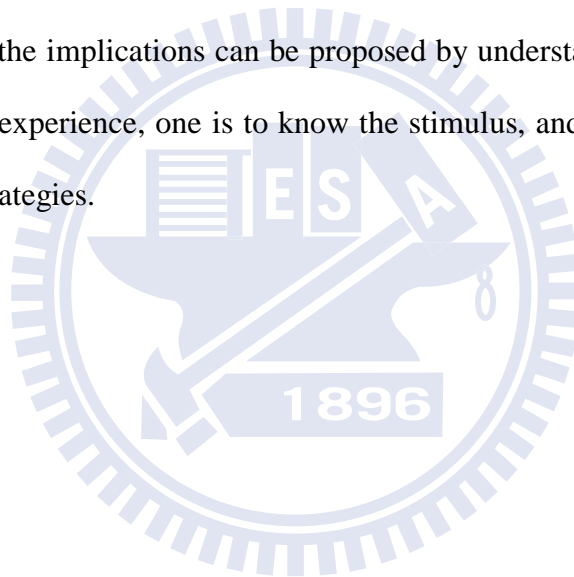

Figure 5-8 the resource of the model building

Such findings highlight the relationship of recognizing passengers' varying emotional experiences. From Figure 5-9, the model was divided into four laddering items: concrete features, negative stimulus, negative emotion, and action / interaction. It was consisted of many contexts from the research, and based on the EGM diagram.

Figure 5-9 shows that passengers have five kinds of negative emotions in bus experience, included reproach, distress, afraid, fatigue, and disappointment, because they received external and intrinsic stimulus, such as driver's bad attitude, other passengers' effect, un-safety driving, management problem, and hardware poorly maintained. And they had their own strategies to response the situation, such as expression, empathy, replacement, compromise, behavior change. Besides, the lines between each item means there is a causal relationship between each other. The

thicker lines mean the highly correlation. And there are four main contextual correlations were presented, each context can response to different strategies.

For service providers, they can know what their users care about. By observing passengers' behavior, they can realize the emotions passengers may have, and they even know what problems should be resolve first. For the future designers, it provides them with the whole negative emotional experience, even though they don't have a considerable degree of understanding of bus experience. Therefore, they not only know the causes of emotion and stimulus, but realize the action / interaction people would do. Besides, the implications can be proposed by understanding the context of negative emotional experience, one is to know the stimulus, and the other is to learn from passengers' strategies.

pass stop without stopping
drive before people sit down
catch up schedule with high speed
bad answer to passenger
all are passengers' fault
drive fast when getting off
unconcern

using phone with high volume
fight for boarding / getting off
noise
fight for the seats
no yield seats to elderly people
priority seats are not enough
smell bad
stuck in the middle of bus

catch up schedule with high speed
easy to fall down
drive before people sit down
turn a corner with high speed
bad gear skill
suddenly brake

out of schedule
late when it rains
many buses come at the same time
pass stop without stopping
payment problem
small bus for lots of people

uncomfortable single seat
screen flicker
no regular maintenance
bell fault
aesthetic damage by many daub
scrolling text marquee fault

NEGATIVE STIMULUS

Hardware poorly maintained

Management problem

Un-safety driving

Other passengers' effect

Bad attitude

APPRAISAL CONTEXT

context D

context C

context B

context A

NEGATIVE EMOTION

Disappoint-ment
disappointed

Fatigue
have no alternative
tired

Afraid
afraid
nervous
astonished
helpless

Distress
painful
worried
embarrassed

Reproach
angry
repugnant
hateful
detestable
resentful
disdainful

ACTION STRATEGY

Behavior change

Compromise

Replacement

Empathy

Expression

EMOTIONAL RESPONSE

-avoidance
-faraway
-get up early
-go out early

-accept
-wait for end
-ignore
-pretend nothing happened

-take taxi, MRT
-change another bus

-consider for others
-blame for others

-post article in the Internet
-blame in the heart
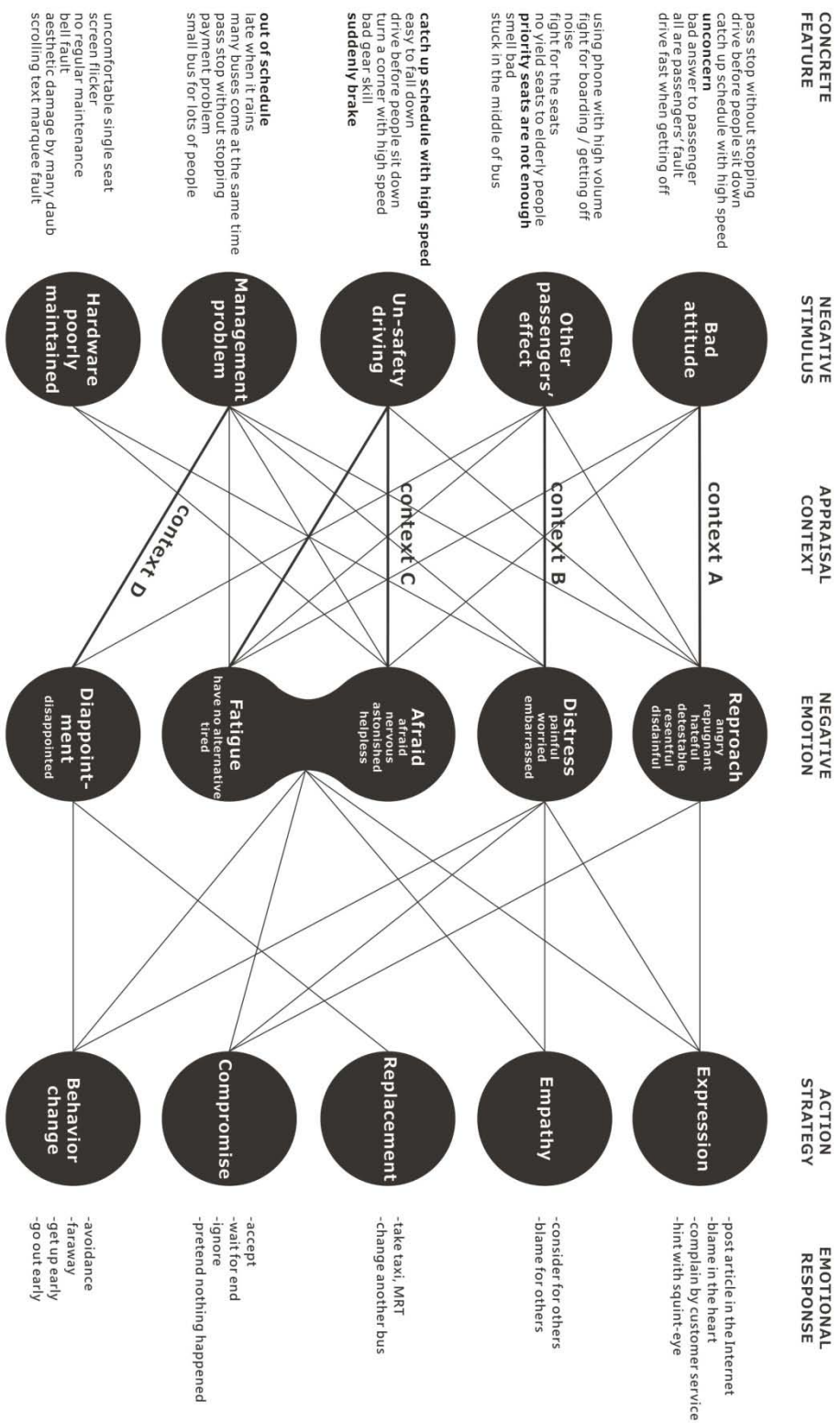-complain by customer service
-hint with squint-eye

Figure 5-9 the model of negative emotional experience

5-4   Design implications

After the discussions about contexts of appraisal system and action / interaction strategies of passengers, the model of negative emotional experience was built. By understanding the core pattern supported the whole experience, and the intervening conditions of appraisal context were analyzed. The following are the brief summaries according to previous research:

a.   Passengers sought for inner peace in the negative emotional experience.

b.   The feelings passengers had were resulted from some intervening conditions.

c.   The other passengers' influence was judged by personal values and sense.

d.   By controlling the situation to overcome the distrust of the service.

e.   Passengers had their own prior expectation before entered the service.

f.   Passengers tried many ways to express their emotions.

g.   Passengers had empathy for the sake of others.

h.   Passengers sometimes gave up or found alternative way.

i.   Sometimes passengers did nothing, just wait for the end.

j.   Passengers would change their behaviors to adapt the situation.

From the above findings, the design implications were proposed to make people have a better experience, shown as follows:

1.   To evoke passengers' empathy, make passengers think for others situation.

Many events occurred under a situation that passengers had no idea about her influence on others. This is also one of main reasons why they unhappy. To create a new service which can evoke people's empathy by design, such as pointing out the purpose of establishment of priority seat is to reduce the negative emotions aroused by morality. Make passengers know each other, and act by their empathy.

If people are considerate about others' physical or psychological status, the possibility to have negative stimulus will be reduced remarkably.

2. **To give passenger more control, to avoid the difference of personal capacity between passengers.**

For bus service, bad operation procedure or passengers' personal delay often results in others' unhappiness. Sometimes people even become very nervous when they feel the external pressure. A new service should provide users with more controllability, whether anyone can easily use and control the situation to their likes (speed or efficiency). Try to eliminate those unnecessary negative emotions aroused by the individual differences, this kind of demand is like the notion of universal design, for example, in some countries, passengers have many ways to pay the fee, they can pay whenever they want, it is a method that to avoid passengers have conflicts. On the other hand, it also could provide more appropriate information to reduce the uncertainty, such as watching the landing on TV screen when airplanes start to land, which could make people feel relieved.

3. **To create a trusted image, make passengers have desire to take bus.**

Passengers trust themselves rather than the service, because there are too many negative experiences making passengers doubt the service. Therefore, to create a trusted image make people change their stereotype to trust the service is the first step. Of course, it takes not only the concentration on creating a new image but a practical improvement plan linked to the image. For example, the bus often out of the schedule because of the traffic condition, the schedule should be separated into different time or day to show. It not only shows the accurate image but really fit the different situation. Only when passengers trust the service, will they eliminate

negative emotions and change the stereotype.

4. **To create an instant channel with the collection of public power.**

For service, when it does not solve the problem efficiently, as time goes by, it will result in a worse loop; however, passengers always think it is difficult to inform service providers their unhappiness due to the lack of effective communication channels. Passengers preferred to post their article in the Internet rather to express their opinions through the existed channel. Therefore, future service should provide passengers with an instant channel can express their feeling immediately and it even can gather opinions from other passengers. It can be kind of collection of public power. For service providers, they could understand the distribution of complains, even give response once complains occur. In brief, an instant expression channel could solve problems before they go worse, and unity is strength, passengers can interact with others, such as the power of BBS was mentioned by interviewee.

Chapter6 Conclusion

This thesis investigated the negative emotions in the bus experience and constructed the model to explain how the negative emotions aroused by the stimulus and how the passengers response to the stimulus. Results in the previous chapter indicate that the integrated research method in this study is beneficial to designers. The findings also reveal the importance of realizing user experience for the future service design.

6-1   Conclusions

Three main objectives were focused in this thesis. The first one was to understand the core pattern of the passage. According to the findings, the sense of empathy played an important role of the appraisal context. And the reason for the negative emotions was resulted from the existence of intervening conditions reflect the stimulus to passengers, rather than the causal relationship from a lopsided view. To sum up, these correlations of each phenomenon were based on the emotional appraisal theory, and the balance between a potential concern to seek inner peace and external stimulus was delivered as a core pattern which supports the whole experience.

Building the model of negative emotional experience was the second objective to achieve in this thesis. By summarizing and organizing the resource from each analysis then the model was delivered, such as the EGM diagram showed the relationship among three level items, the accurate correlations were computed by the quantitative theory type I analysis, the analysis of appraisal context was conducted by reviewing the data again, and the action / interaction strategies were linked to each context. Finally, the model was constructed by the correlations of the stimulus, the emotion,

the action / interaction strategy, and concrete service feature. It clearly shows that the different negative emotion can be aroused by the different stimulus, and passengers have their own action / interaction strategies to response the stimulus. For service providers, understanding the passengers' behavior can be inferred to the hardship points that suffered by passengers. For future designer, the model provides them with the whole negative emotional experience, even though they didn't have a considerable degree of understanding.

The last one was to apply the findings to design implications. The implications of this study clearly show different perspectives of understanding. In order to have a better bus service, the future service should dedicated to evoke passengers' empathy, give passengers more control, create a trusted image, and reflect the immediate atmosphere. In conclusion, all design implications are aim to make passengers feel peace in their mind.

6-2　Reviews

Participants were interested in the study of negative emotion, because they were familiar with negative experience and had a high level of expectation to improve the current situations. It was a surprising feedback from the participants. It shows that the future designers and the service providers should avoid being narrow-minded but see things as a big picture. A successful service should provide the user with a pleasing user experience by realizing and understanding the user context.

The problems often occurred under the surface because of the unexpected and unseen factors. Only when understanding the context under behaviors, it is possible to find

the opportunity to resolve these problems completely. The vivid world of negative emotion and experience could be explored comprehensively by following the notions of this thesis. It also helps people to envision and describe more about their desires. The findings and the implications in this study can be generalized and extended to the future groups of the passengers who are similar to the participants in this study.

6-3 Value of research

This thesis aims to help service providers create services that are not only cost effective, but design-into-service. This thesis intends to propose usable, relevant, widely-applicable design thinking for service providers and designers to evolve and transform their services. This study may be critically important in laying a groundwork for understanding how to designing a service with innovative methods and also concludes with implications for theory, research, and practice. While research on these questions is still at a beginning stage, findings and notions of procedure will have some implications for the designers and service providers.

6-4 Recommendations for future research

In the future, among the many topics to be explored by researches, some important subjects can be listed as followed:

1. Future research could examine the interaction between personalities and emotions. Even try to study the differences between target users across different cultural, linguistic, or ethnic groups.

2. According to the model of emotional experience, in order to precisely understand the negative emotion of user experience, an accurate relationship will be found by conducting a questionnaire

Reference

Arnold, M. B. (1960). *Emotion and Personality*. New York: Columbia Press.

Battarbee, K. (2005). *Co-experience: User experience as interaction*. CoDesign, 1(1), 5.

Brave, S. B. (2003). *Agents that care: investigating the effects of orientation of emotion exhibited by an embodied computer agent*. Unpublished doctoral dissertation. Stanford University Stanford, CA, USA.

Brave, S. and Nass, C. (2003). *Emotion in Human-Computer interaction: The HumanComputer Interaction Handbook*. Jacko & Sears Lawrence Erlbaum**: 81-96.

Carlson, R. (1997). *Experience Cognition*. NJ, USA: Lawrence Erlbaum.

Creusen (1998). *Maria Elisabeth Hubertina. Product appearance and consumer choice*. Unpublished doctoral dissertation, Technische Universieit Delft, Delft.

Desmet, P. M. A. (2002). *Designing Emotions*. Delft: Delft University of Technology.

Diener, E. and Lucas, R. E. (2000). *Subjective emotional well-being. In M. Lewis & J. M. Haviland (Eds.), Handbook of emotions (2nd Edition) (pp. 325-337)*. New York: Guilford.

Ekman, P. and Friesen, W. V. (1971). Constants across culture in the face and emotion, *Journal of Personality and Social Psychology*, 17, 124-129.

Ekman, P. and Davidson, R. J. (1994). *Afterword: What is the function of emotions?* In P.Ekman & R. J. Davidson (Eds.). The Nature of Emotion: Fundamental

Questions (pp. 137-139). New York: Oxford University Press.

Forlizzi, J. and Battarbee, K. (2004). *Understanding experience in interactive systems*,Proceedings of DIS2004, ACM.

Frijda, N. H. (1986). *The emotions*, Cambridge: Cambridge University Press.

Frijda, N. H. (1994). *Varieties of Affect: Emotion and Episodes, Moods, and entiments, The nature of emotion. P. Ekman & R. J. Davidson*, New York, Oxford University Press: 59-67.

Gaver, W., Dunne, T. and Pacenti, E. (1999). *Cultural probes. interactions*, 6 (1), January–February, ACM Press, New York, NY, 21–29.

Gaver, W. (2001). *The Presence project*, London: RCA CRD Research Publications.

Glaser, B. G. and Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*, New York: Aldine Publishing Company.

Hammersley, M. (1989). *The Dilemma of Qualitative Method,* London: Routledge.

Huang, J. C. (2007). *Annoyance Prediction Model in User-Product Interaction,* Unpublished doctoral dissertation, National Cheng Kung University, Taiwan.

Hulkko, S., Mattelmaki, T., Virtanen, K. & Keinonen, T. (2004) *Mobile Probes*. Hyrskykari, A (ed) Proceedings of NordiCHI04. ACM Press, New York, NY, 43–51.

Isen, A. M. (1993). *Positive Affect and Decision Making. Handbook of emotions. M. Lewis & J. M. Haviland*, New York, Guilford, pp. 261-277.

Izard, C. E. (1977). *Human emotions*, New York: Plenum Press.

Jordan, Patrick. (2000). *Designing Pleasure Products: An Introduction to the New Human Factors*, London: Tayor & Francis.

Kelly, G. A. (1955). *The psychology of personal constructs.* 2 volumes, New York:

Norton.

Koskinen, L. (2003). *Empathic design: User experience in product design.* Finland: IT press.

Larsen, R. J. and Fredrickson, B. L. (1999). *Measurement issues in emotion research.* In D. Kahneman, E. Diener & N. Schwarz (Eds.), Well-Being: The Foundations of Hedonic Psychology (pp.40-60)*,* New York: Russell Sage Foundation.

Lazarus, R. S. (1991). *Emotion and adaptation*. London: Oxford University Press.

Mager, B. (2008). *Service Design definition in the Design Dictionary*, Köln: Birkhäuser Basel.

Mager, B. (2009). *Introduction to Service Design*. Digital communications tool, Köln: Culminatum Innovation.

Mattelmäki, T. (2006). *Design probes*. Finland: IT press,.

Miettinen, S. and Koivisto, M. (2009). *Designing service with innovative method*. Finland: IT press,.

Moritz, S. (2005). *Service design: practical access to an Evolving Field*. Köln International school of design, University of Applied Science cologne, Köln.

Norman, D.A. (1998). *The invisible computer.* Cambridge, MA: MIT Press.

Norman, D. A., Ortony, D.A., and Russell, M. (2003). *Affect and machine design: Lessons for the development of autonomous machines*. IBM Systems Journal, 42(1),38-44.

Norman, D. A. (2004). *Emotional Design: Why We Love (or Hate) Everyday Things*, New York: Basic Books.

Ortony, A., Clore, G. L., and Collins, A. (1988). *The cognitive structure of emotions,*

New York: Cambridge University Press.

Plutchik, R. (1980). *A general psychoevolutionary theory of emotion.* In R. Plutchik & H. Kellerman (Eds.), Emotion: Theory, research, and experience: Vol. 1. Theories of emotion (pp. 3-33), New York, Academic.

Roseman, I. J. and Smith, C. A. (2001). *Appraisal Theory.* In: K. Scherer, A. Schorr, T. Johnstone (Eds.). Appraisal Processes in Emotion: Theory, Methods, Research, Oxford: Oxford University Press.

Russell, J. A. (1980). A circumplex model of affect, *Journal of personality and social psychology*, 39, 1161-1178.

Saco, R M. (2008). *Service design: An appraisal*, Design Management Review, 19(1), 10.

Sanui, J. (1996). *Visualization of users' requirements.* Introduction of the 3rd Design & Decision Support System in Architecture & Urban Planning Conference, Vol.1, pp365-374.

Scherer, K. R. (2001). *Appraisal considered as a process of multi-level sequential checking,* In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.). Appraisal processes in emotion: Theory, Methods, Research (pp. 92-120), New York and Oxford, Oxford University Press.

Shaver, P., Schwartz, J. , Kirson D., & O'Connor C. (1987), "Emotion Knowledge: Further Exploration of a Prototype Approach," *Journal of Personality and Social Psychology,* 52 (6), 1061-1086.

Strauss, A. and Corbin, J.. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*, Thousand Oaks, CA: Sage Publications.

Tanaka, Y. and Wakimoto, K. (1983). *Methods of multivariate statistical analysis*, Tokyo: Gendai Sugoku.

Tomkins, S. S. (1984). *Affect theory.* In K. R. Scherer, & P. Ekman (Eds.), Approaches to emotion (pp. 163-196), Hilldale, NJ, Lawence Erlbaum Associates.

Tse, David K. & Peter C. Wilton (1988), "Models of Consumer Satisfaction Formation: An Extension," *Journal of Marketing Research*, 15 (May), 204-212.

Zaichkowsky, J. L, (1985). Measuring the Involvement Construct, *Journal of Consumer Research*, pp. 341-352.

Zaichkowsky, J. L. (1994). The Personal Involvement Inventory: Reduction Revison and application to Advertising, *Journal of Advertising*, Vol. 23, pp. 59-70.

Website:

live │ work. (2008). *Service Thinking.* Retrieved February 9, 2010, from http://www.livework.co.uk/articles/service-thinking

Design Council. (2009). *Service Design.* Retrieved January 15, 2010, from http://www.designcouncil.org.uk/About-Design/Design-Disciplines/Service-design-by-Bill-Hollins/

Appendix:

1. Probes

2. Personal evaluation diagram

3. Frequency table

4. Questionnaire

5. Quotation

Appendix 1: Probes

Appendix 2: Personal evaluation diagram

上位
(意涵價值)　中位
(評價項目)　下位
(具體特徵)

連續好幾天提心吊膽
生氣的
羞愧的
吃驚的
複雜的
心神不寧的
丟臉的/尷尬的
迷惑的/怪怪的
不信賴感
與認知不同
焦慮的
擔心的
無助的
急躁的
緊張的
討厭的
不安的
壓抑的
煩
無法避免
怨恨的
憤怒的
暴怒的
誇張
很悲哀
捨不得老人們
不爽/鬱悶的
噁心
難過的
沮喪的
失望的
垂頭喪氣的
懷疑的
警惕的
懷疑的
反感的
困難的
痛苦的
疲累的
困擾的
不舒服的
鄙視的
可恨的
自負的

02偶發事件
04&06很難使用
01公車慢班
08危險事件
07&09司機服務和態度不好
03&10乘客影響旁人
05讓位問題

猥褻行為
事件發生的路口
搭錯車或方向
網路與現實不同
看不懂時刻及路線圖
公車上貼錯誤的地圖
要去的地名不等於站名
比時刻表慢很多
下雨天會慢很多
公車拋錨或車禍
公車無法取得慢班證明
司機催油門趕班次
容易摔倒
在車上找零錢
最後一個上車很危險
態度冷漠
對老人不關心
不等待乘客就位就開車
不好好幫乘客解答
沒有服務人員
愛理不理只用手指
大聲講電話吵人
肢體及物品碰觸
上班時間老人很多
車上睡覺無法讓位
中年婦女搶位子
即使有座位男生也站著

2009.04.25 Participant_B@TAIPEI

上位　　　　　　　　　　中位　　　　　　　　　下位
(意涵價值)　　　　　　　(評價項目)　　　　　　(具體特徵)

遲到會不好意思　　　　　01&04沒搭到車　　　　沒人招手，車就開走了

麻煩　　　　　　　　　　　　　　　　　　　時間差沒抓好

不想花太多時間等車　　　　　　　　　　　　公車時間不定

時間若暫停就趕得上車　　　　　　　　　　　雨天特別麻煩

快一點就可以趕上　　　　　　　　　　　　太早等車要等很久

沮喪的　　　　　　　　　　　　　　　　　太晚等車會很趕

無助的　　　　　　　　　　　　　　　　眼看著公車走了

失望的　　　　　　02司機開車技術　　　　　過彎太快

必須小心抓穩　　　　　　　　　　　　　轉車的時間會錯失

應多注意乘客的動態　　　　　　　　　乘客未就座就開車

司機耐性差　　　　　進檔很急

生氣的　　　　　　　　　　　　門關得太早

吃驚的　　　　　　　　　　　司機開太多站疲憊了!

警惕的　　　　　03&05其他乘客的影響

尷尬的　　　　　　　　　　　老人上車就停留很久

矛盾　　　　　　　　　　　下車時車太快開走

被迫要聽　　　　　設施設計不當　　講手機很大聲不自知

他人臉皮厚

心急的　　　　　　　　　　　個人位過小

鄙視的　　　　　　　　　　站著的人會擠到坐著的人

不舒服　　　　　　　　　　門上很多內衣的廣告

2009.04.26 Participant_C@TAIPEI

上位
(意涵價值)

中位
(評價項目)

下位
(具體特徵)

希望掌握自己的時間
判斷可否做其他事情
煩惱的
焦慮的
擔心的
沮喪的
急躁的
不安的
生氣的
憤怒的
暴怒的
疲累的
引起眾怒/怨恨的
緊張的/吃驚的
討厭的
很想回家
覺得司機不適任
認為乘客知道所有資訊
反感的
痛苦的
鬱悶的
害怕的
尷尬的/丟臉的
莫名其妙
沒人情味
影響整天上班情緒
推卸責任
警惕的
羞愧的
想吐
震驚的
複雜的
無助的
不尋常的
失望的
浪費資源的感覺
鄙視的

01想要知道公車會來的時間
03下班比上班難等車
02&07司機開車技術不好
司機態度不好
05公車設計不良
04&06公車制度安排不良
08公車設施的維護不良

上下車都會注意時間
等車人數判斷車子來的時間
一直回頭看公車來了沒?
車來了就得用跑的
有時間去別的地方逛逛
等了很久卻一次來很多台
會做別的事打發時間
打檔的技術很差
一直碰撞的感覺
老人會跌倒很危險
路線圖看不太懂
回話很嗆、沒禮貌
上下車投錢的問題
大聲喊話、口氣兇
認為都是乘客的問題
愛理不理只揮手回答
下雨天，地板很滑
安排小車走道小、門又小
人擠人不舒服
地圖還是看不懂
螢幕一直閃
沒有定期保養
下車鈴故障
椅子不好坐
搖晃很大
空氣悶

2009.04.25 Participant_E@TAIPEI

上位
(意涵價值)

中位
(評價項目)

下位
(具體特徵)

生氣的
討厭的
憤怒的
暴怒的
異常激動的
反感的
鄙視的
難過的
激動的
壓抑的
尷尬的
失望的
不能忍受的
無奈/沒有辦法

01 04 06 07 08
其他乘客影響到我

上車不等人下車，為了搶位子!
太吵、不安靜
動作太大，會打到我
當場親熱
不讓位
人擠到中段

02 03 09
司機的態度差

橫衝直撞
緊急剎車和加速
不照時間表開車
下雨天司機過站不停

浪費感
煩惱的
焦慮的
擔心的
痛苦的
疲累的
憂鬱的
不舒服
未知感

05 10
公車的制度規則

不找零
沒有帶悠遊卡
一次來兩台車
其他的公車擋在站前

鬱悶感
納悶感
擔心感

硬體環境差

跑馬燈壞了
舊，不乾不淨
車上塗鴉
公車門會夾到人

2009.05.22 Participant_H@TAIPEI

上位 (意涵價值)	中位 (評價項目)	下位 (具體特徵)
擔心的	03&04下車資訊問題	沒有標示下一站
煩惱的		司機沒有告知
討厭的		跑馬燈壞了
焦慮的	03&05&10設備問題	避震器很硬，震得很痛
困難的		冷氣控制不良，很冷
緊張的		下車鈴按了沒反應
不安的		車內廣告都無更換
害怕的	01&09乘客道德問題	車內電視常故障
難過的		上下車擠同一個門
痛苦的	02司機的態度問題	不讓座裝沒看到
吃驚的		車內亂丟垃圾
可恨的	07交通狀況問題	過站不停
複雜的		招手攔車才會停車
生氣的		司機表情看起來很差
羞愧的		時間和站牌寫的都不一樣
憤怒的		台灣不管甚麼都不準時
失望的		
痛苦的	08人數多寡的感受	搭乘的人比以前還少
悲觀的		走在路上的人也變少了
傲慢的		
疲累的		
不尋常的		
不可思議的		
想罵人		
浪費時間		
懷疑的		
心情不好		
靠運氣		
很無聊		
很恐怖		
想揍人		
不敬業		
不想搭乘 卻沒辦法		
不可控制		
經濟變差感		

2009.05.05 Participant_J@TAIPEI

上位 (意涵價值)	中位 (評價項目)	下位 (具體特徵)

早知道就...
賭注的感覺
生氣的
放棄了改搭計程車
硬著頭皮上車
憤怒的
失望的
怨恨的
討厭的
反感的
鄙視的
激動的
反效果
不感興趣
無最佳化的考量
矛盾
煩惱的
暴怒的
不好意思
將心比心
不舒服
尷尬的
浪費時間
危險
可恨的
疲累的
沮喪的

01&02&06公車調度問題
04乘客問題
08&09環境問題
05設施問題
03&07&10司機問題

等不到車或是一次來很多輛
下雨天人擠人
動態系統與現實有誤差
一班很擠、一班很空
班次少的車需要上網查
不排隊擠著上車
不讓座給老弱婦孺
汗味和食物味很重
有蟑螂出沒
電視聲音太大
重複播放的廣告
車上看東西頭會暈
電視字幕看不太清楚
椅子被割破
讀悠遊卡的機器讀不太到
亂塗鴉破壞美觀
下車鈴壞了
司機趕班
過站不停
名字可以投訴
技術太差、緊急剎車
沒站穩車就開了
沒聽到乘客下車鈴

2009.05.05 Participant_K@TAIPEI

Ladder-up item abstract meaning ↓	Middle item original evaluation ↓	Ladder-down item concrete feature ↓

Reproach

Distress

Afraid

Fatigue

Disappoint-ment

management problem
24

unsafety driving
21

bad attitude
25

other passengers'effect
21

hardware poorly maintained
14

out of schedule 9

late when it rain 3

many buses come at the same time 3

pass by stop without stopping 4

payment problem 3

small bus for lots people 2

catch up schedule with high speed 5

easy to fall down 3

departure before people sit down 6

turn a corner with high speed 2

bad gear skill 3

suddenly brake 2

unconcern 4

bad answering to passenger 2

shirk self-responsibility to passenger 2

drive fast when passenger just getting off 2

using phone with high volume 3

fight for boarding/getting off 4

noise 2

fight for the seats 2

no yield seats to elderly people 4

priority seats are not enough 2

smell bad 2

stuck in the middle of bus 2

uncomfortable single seat 3

screen flicker 2

no regular maintenance of old thing 2

off-belt fault 3

aesthetic damage by many daub 2

scrolling text marquee fault 2

Appendix 3: Frequency table

oringinal evaluation	concrete feature(ladder-down)	abstract meaning(ladder-up)	
management problem	out of schedule(9)*	angry(4)*	tired(3)*
	late when it rain(3)*	anxious	astonished
	bus accident or broken	worried(3)*	want to go home
	no provement of delay	helpless(3)*	disappointed(5)*
	catch up schedule with hagh speed	distress	frustrated
	many buses come at the same time(3)*	impatient	have no alternative(4)*
	pass stop without stopping(2)*	resentful(3)*	regretful
	bad transfer	hateful(3)*	uncomfortable
	payment problem(3)*	fury	can not concertrate
	small bus for lots people(2)*	melancholy	detestable(4)*
	road map can not be read	shirking responsibility	downhearted
	one is crowed, one is empty	vigilant	downcast
	check bus many times	ashamed	unusual
	the gap between the system & reality	astonished	sorry for being late
	shirk self-responsibilty to passenger	complicated	troublesome
	other bus block the stop	vexatious	do not want to spend time
		depend on luck	gambling
		anxious	difficult
		hateful	give up
		force oneself to get on	repugment
		wasty	baffled
unsafety driving	catch up schedule with high speed(3)*	ashamed	accepted
	easy to fall down(5)*	embarrassed	unconcern
	paying and bus moving at the same time	nervous(4)*	inconvenient
	big shaking	repugment(4)*	dislike
	departure before passenger sit down(4)	difficult	avoidable
	turn a corner with high speed(2)*	painful(3)*	afraid(3)*
	bad gear skill(3)*	tired(3)*	hysterical
	suddenly brake(2)*	vigilant	helpless
	impatient to drive	not suitable for this job	effect my dress
	get on and off in the middle of road	angry(4)*	contradiction
	not heard the off-bell	detestable	waste time
		worried	dangerous
		anxious	hateful
		wrathful	frustrated
		resentful	melancholy
		distressed	
bad attitude	catch up schedule with high speed(2)*	angry(3)*	reluctant
	unconcern(4)*	ashamed	melancholy
	do not care the elders	astonished(3)*	disgusting
	departure before passenger sit	embarrassed	tired
	badly answering to passenger(2)*	worried	frustrated
	shirk self responsibilty to	detestable(3)*	disappointed
	pass by without stopping(2)*	exaggerated	downcast
	drive fast when passenger just getting off(2)*	sorrowful	doubtful
	payment problem	unconcern	vigilant
		have no alternative(3)*	wrathful
		scared	hysterical
		sad	repugment

		want to hit someone	painful
		not work hard	vexatious
		gloomy	anxious
		uncomfortable	unknow

other passengers' effect	**using phone with high volume(3)***	**detestable(5)***	hateful
	fight for boarding/getting off(4)*	suoressed	**angry(5)***
	noise(2)*	impatient	**embarrassed(3)***
	someone is sleeping	melancholy	reluctant
	fight for the seat(2)*	disgusting	**disappointed(3)***
	be yielded seat without saying "thanks"	**painful(3)***	**repugment(4)***
	no yield seats to elderly people(4)*	tired	pompous
	too many elders to departure in seconds	persecution	difficult
	priority seats are not enough(2)*	contradiction	pity
	smell bad(2)*	**have no alternative(3)***	impolite
	litter	shameless	unconcern
	playing with big motion	urgent	**hateful(4)***
	intimate behavior	**distainful(5)***	want to escape
	wet umbrella	uncomfortable	hysterical
	stuck in the middle of bus(2)*	worried	hysterical
		frustrated	reflection
		downcast	fury
		why don't you like me	astonished
		afraid	doubtful
		astonished	vigilant
		complicated	sad
		ashamed	pessimistic
		vexatious	reproach
		intolerant	waste time

hardware poorly maintained	all people stuck inside	**embarrassed(3)***	resentful
	too many shy advertisments	umcomfortable	fury
	slippery floor	distressed	wasty
	umcomfortable single seat(3)*	angry	distainful
	stuffy air	**astonished(4)***	painful
	screen flicker(2)*	detestable	worried
	no regular maintenance of old	repugment	sad
	off-bell fault(3)*	affect all day mood	anxious
	chair was cut by something	vigilant	difficult
	card reader mechine broken	ashamed	hateful
	aesthetic damage by many daubs(2)*	wrathful	incredible
	scrolling text marquee fault(2)*	vexatious	reproach
	shock absorber is so hard	sorry	boring
	bad control of air condition	empathic	**nervous(4)***
	same advertisment for a long time		
	hurt by bus door		

Appendix 4: Questionnaire

交通大學應用藝術研究所

負面情緒調查

請以您搭乘公車的經驗來填寫以下情緒量表，主要是要了解您搭乘公車時所產生的負面情緒為何及您在意的具體事件程度？

具體特徵：
"公車營運管理有問題"情況裡，讓您產生惡慟感的項目為何?(單選)
1. 跟時刻表差很多
2. 下雨天公車慢很多
3. 等了很久卻一次來很多台
4. 等車或乘車時，過站不停
5. 上下車付款出問題
6. 人數很多卻安排小型公車

具體特徵：
"公車行車不安全"的情況，讓您產生惡慟感的項目為何?(單選)
1. 等車或乘車時，過站不停
2. 司機催油門趕班次
3. 容易跌倒
4. 乘客未就座就開車了
5. 過彎太急
6. 打檔技術很差
7. 緊急剎車

具體特徵：
"公車司機態度差"的情況，讓您產生惡慟感的項目為何?(單選)
1. 等車或乘車時，過站不停
2. 司機催油門趕班次
3. 乘客未就座就開車
4. 態度冷漠
5. 不好好為乘客解答
6. 認為都是乘客問題、口氣差
7. 下車時公車太快開走了

具體特徵：
"公車硬體品質不良"的情況裡，讓您產生惡慟感的項目為何?(單)
1. 個人座位太小不好坐
2. 電視螢幕故障一直閃
3. 沒有定期保養所以舊舊的
4. 下車鈴故障
5. 亂塗鴉破壞美觀
6. 跑馬燈故障

具體特徵：
"其他乘客影響到我"的情況裡，讓您產生惡慟感的項目為何?(單選)
1. 大聲講電話
2. 不排隊上下車很擁擠
3. 乘客聊天不安靜
4. 中年婦女搶座位
5. 不讓座給老弱婦孺
6. 老人太多、博愛座太少
7. 汗味、香水味很重
8. 乘客都擠在中段不往裡面走

■ suzugraph *搭乘大眾運輸工具的負面情緒研究*

Appendix 5: Quotation

[Quote 01]

「早上明明很早出門，照理說不會遲到，但等車等很久，也不知道幾分到站，常常因為等超過十幾分鐘，造成上班遲到，等捷運建好了，我就寧願去搭捷運。」(participant_D)

「跟平常停一個時間上車，平常公車裡雖然不擠，可是有一些人站著，不過某一段時間，人非常少有很多空位子，我以為我睡過頭了，其實不是，應該經濟最差的時候，最令人擔心、可怕。」(participant_J)

「等車時最令人生氣的莫過於自己想做的車都不來，卻看著其他公車一班班從面前駛過，好不容易等到了，卻又是一次來兩班，讓人不禁懷疑是否調度上有問題。」(participant_K)

「一出街角發現站牌附近一個人都沒有，想必是上一班公車剛離開，感覺又要等車等很久。擔心下一班車會不會等 10 分鐘以上，有時很快就有車來，有時卻得等很久，這種不一定的狀況讓人真煩躁。」(participant_D)

[Quote 02]

「塞車!上下班尖峰時間很容易塞車，本來 30mins 的路程可能要 50mins，白白浪費時間又要更早起。」(participant_D)

「下雨天時車上總是濕搭搭的...地上濕就算了，有時腳或裙子,褲子都會被隔壁乘客的傘弄濕，當下又會有不太高興，難道不能稍微用傘捲綁起來嗎？像我的雨傘就是自動開闔，不會弄濕別人。」(participant_A)

「從家裡到公車站牌馬路不好過，很多人還沒到紅綠燈路口就直接穿越馬路(包括我)，其實好危險但又趕時間。」(participant_D)

[Quote 03]

「公車的時間太不準時，雖然有寫大概幾分鐘有一班，可是有時候等了 20 分鐘、30 分鐘...快等了一個小時才有一班車過來，還好那時是下班的時候...」(participant_J)

「公車不找零錢的現象非常不合理，如果單程票要 15 元，可是你口袋只有兩個 10 元硬幣，那當下你就要貢獻 5 元給公車司機。」(participant_H)

[Quote 04]

「要下車付錢的時候，找不到錢包，司機就很不耐煩的說 " 是不會事先拿出來喔 " 當場感覺就很糟。」(participant_D)

「碰到態度很差的司機先生，問他路線愛理不理又兇，不僅生氣而且也煩惱路找不到搭錯車。」(participant_D)

「一上車，若是上車投票就必須刷卡，此時如果卡的感應不良，後面又有一排人等著要上車就會有些不好意思，尤其是雪上加霜地遇到沒耐心的司機，一臉不耐煩，也會影響情緒。」(participant_K)

「司機看乘客一下車就把車開走了，感覺真不耐煩、真危險。」(participant_B)

[Quote 05]

「上班快遲到了，偏偏有一站一群阿公阿嬤提著大包小包菜籃上車。」(participant_C)

「下班後等公車回家，很累了很想要有位子可以休息，但是沿途經過龍山寺有好多老人家上來，到底該不該讓位?路途近50mins，站著很累!坐著心也不安，真兩難啊!」(participant_D)

「可能是個性保守，對於在車上做出親密動作的學生很不以為然，幾乎無視其他乘客的感受。」(participant_H)

「下班搭車回家時，車上有個白目中年人，講手機有夠大聲，內容講的是有關coding的，應該是個RD之類的吧！大聲就算了，還比手劃腳，跟對方說話口氣一副自己超強的樣子，感覺就像是故意講給車上乘客廳的！上整天班就夠累了，還要受到她的聲音轟炸，頭有夠痛的！！」(participant_B)

「今天上班搭小到小車，有一點擠，但還是有做到一個靠走道的座位。隔壁靠窗的乘客下車時從我前面擠不太出去，接

著另一個乘客要坐進來，肩上的包包還直接甩中我的臉，那位太太也沒發現...感覺很倒楣!而且小車筆大車更晃，很討厭坐小車!」(participant_D)

「早上搭公車上班，途中有個拿拐杖的阿公上車，我立刻站起來跟阿公說〞阿公這乎你坐〞結果我的後腳都還沒踏出來，站在我旁邊的那位小姐竟然把腳伸進來卡位!我不想讓他得逞所以一動也不動盯著他看。那個 阿公還說〞沒要緊啦!我去後面坐〞我說〞後面也沒位了，這乎妳坐啦〞說完這句話，那位小姐才放棄搶位子，沒想到連OL也會做出這種丟臉的事...」(participant_B)

 [Quote 06]

「有些司機開車橫衝直撞，站都站不穩，拉著拉環的手很痛很吃力，尤其人多還會有拉環不夠的問題，真的很擔心跌倒!」(participant_D)

「公車本來就已經夠搖搖晃晃了，這個司機還技術這麼差，打檔時整台車像被追撞一樣，從起步到三檔，就得被撞2次。停完紅燈重新再被撞2次，一直被撞得頭很痛＝＝，萬一車上有老人家站著都不知道要跌倒幾次了!」(participant_D)

「站在司機附近，發現司機開車不與前車保持一些距離，每次都在超接近前方車輛時候才準備剎車，感覺都快撞到了，很心驚膽跳!最後停住的時候，與前車往往距離不到50公分，晚一撞上不知道會發生甚麼事...」(participant_D)

「司機不顧上班時間人潮擁擠，行車乎快忽慢，一下子衝油門一下子又急煞車，穿著高根鞋左搖右晃的，要超用力抓緊握把或扶手，很累！！都要練就金剛臂了...>_<」(participant_A)

「不是要經過考試嗎?為什麼開得這爛??」(participant_A)

 [Quote 07]

「明明住處離公車不到3分鐘...，可是當看到公車在自己眼前開走時還是很沮喪啊～又或是拼命揮手公車卻直接繞過～嗚～」(participant_A)

「剛走到站牌前的紅綠燈等，眼睜睜看著公車停站後離開Orz」(participant_C)

「在車上我覺得最不想看到的景象首推" 看到一台同樣路線的空車從旁邊超車 " 尤其是當 你是在很壅擠的車上看到旁邊的車空空的又開很快，真的很不爽。」(participant_K)

「可能是汐止比較偏僻，所以每班公車的時間表好像都不固定，而且錯過這一班，有時候要等上20幾分鐘，才會有下一班公車。」(participant_H)

「從我每天的、坐了這麼久的公車的經驗判斷還是會出錯...雖然有時間表可是從來沒有準時過，因為每個司機不太一樣」(participant_H)

 [Quote 08]

「早上搭車依然很擠，途中有位老太太上車，他似乎不熟悉路線...過份的司機硬是不開車，堅持要老太太移動位置(司機是瞎了嗎?)結果逼得老太太只好下車。我後來記下了司機的名字，寫信去公司申訴，不知道會不會有回應?」(participant_B)

「遇到這麼差的事之後，回去就貼在自己的 Blog 還有 BBS 上的黑特板發洩，有好多人回應...還有人說原 po 我來保護妳、剎了他...」(participant_B)

「公車先生你馬幫幫忙，我是上班族耶，阿你慢 5 分鐘到就算了，還唱歌慢慢開，50CC 都從旁邊經過，我都〞脆心了〞、〞暗!上班又遲到了〞」(participant_D)

「不能對他怎麼樣，只能在心裡 OOXX...」(participant_H)

 [Quote 09]

「他人不讓位的時候都沒想到自己家裡也有老人嗎?」(participant_B)

「覺得別人的香水擦很大擦不用錢，很不舒服，於是覺得自己香水以後擦少一點，覺得可能在別人心裡會被罵...」

(participant_A)

「看到司機對別的老人很不好時，我會替他感到悲哀，捨不得老人這麼辛苦...」(participant_B)

「司機看到有行動不便的老人在等車卻故意過站不停...解決的方法到是還好，現在都可以知道司機的名字，去他們公司投訴...」(participant_K)

「有人遇到機器出了問題，對排在後頭的人覺得很不好意思...但將心比心就沒關係了...」(participant_K)

[Quote 10]

「搭公車就像是一場賭注」(participant_K)

「時間上若比較急，就改搭捷運...」(participant_A)

「有時候也不是早點出發就會等得到車...就會覺得很生氣啊，就改搭計程車...」(participant_K)

「最長曾經等了 40 分鐘，不如自己走路回家...」(participant_D)

[Quote 11]

「公車的時間太不準時，雖然有寫大概幾分鐘有一班，可事有時候等了 20 分鐘、30 分鐘...快等了一個小時才有一班車過來，還好那時是下班的時候...」(participant_J)

「公車不找零錢的現象非常不合理，如果單程票要 15 元，可是你口袋只有兩個 10 元硬幣，那當下你就要貢獻 5 元給公車司機。」(participant_H)

「雖然會覺得司機這樣不好，但又想司機不都是這樣子嗎？」(participant_A)

「車上好多人嘢，擠得很不舒服，再等幾站看看會不會好一些？」(participant_K)

[Quote 12]

「每次下雨，車上大家的傘都不收好...人家怎麼不跟我一樣換成自動傘...我一定要秀一下我的傘」(participant_A)

「公車橫衝直撞的，上班或搭車時盡量不要穿高跟鞋，擔心危險」(participant_A)

「為了避免上車找東西付款不穩而跌倒，所以會事先準備好悠遊卡!而且上車排隊時盡量避免當最後一個...」(participant_B)

[Quote 13]

「雖然會覺得司機這樣不好，但又想司機不都是這樣子嗎？」(participant_A)

「司機不理會，只好問其他乘客，只能在心裡生悶氣，但又不能跟他吵起來...」(participant_B)

「司機看到有行動不便的老人在等車卻故意過站不停...解決的方法到是還好，現在都可以知道司機的名字，去他們公司投訴，但投訴不一定有用...」(participant_K)

[Quote 14]

「他人不讓位的時候都沒想到自己家裡也有老人嗎？」(participant_B)

「我可能只能轉頭斜眼看一下他，也不能禁止人家...」(participant_B)

「隔壁的香水味道好重，我只能換位子盡量避開...」(participant_A)

「車上好多人嘢，擠得很不舒服，再等幾站看看會不會好一些？」(participant_K)

「有人遇到機器出了問題，對排在後頭的人覺得很不好意思...但將心比心就沒關係了...」(participant_K)

「車上真的很吵，戴上耳機把音量調大...」(participant_A)

「每次下雨，車上大家的傘都不收好...人家怎麼不跟我一樣換成自動傘...」(participant_A)

[Quote 15]

「站著的時候更討厭他，你不知道甚麼時候會衝撞」(participant_H)

「公車橫衝直撞的，上班或搭車時盡量不要穿高跟鞋，擔心危險」(participant_A)

「為了避免上車找東西付款不穩而跌倒，所以會事先準備好悠遊卡!而且上車排隊時盡量避免當最後一個...」(participant_B)

「車上好多人唷，擠得很不舒服，再等幾站看看會不會好一些?」(participant_K)

「雖然會覺得司機這樣不好，但又想司機不都是這樣子嗎?」(participant_A)

[Quote 16]

「每次都看著公車開走。剛好有個地下道，下去在上來到站牌公車就會剛過來，若走路上就會來不及，這是我一定要炫耀一下的。」(participant_C)

「明明住處離公車不到3分鐘...，可是當看到公車在自己眼前開走時還是很沮喪啊...當下都會有點後悔，希望自己下一次能夠早一點出發，不過下次還是一樣遲到...」(participant_A)

「有時候也不是早點出發就會等得到車...就會覺得很生氣啊，就改搭計程車...」(participant_K)

「有時候會很後悔說剛剛為何不早點出門、為什麼要拖拖拉拉的...」(participant_A)