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**CONSUMER'S ADOPTION
OF TECHNOLOGY INNOVATIONS:
THE ROLE OF COPING STRATEGIES**

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LINGNAN UNIVERSITY

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**CONSUMER'S ADOPTION
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by
BAO Wen Jing

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submitted in partial fulfillment
of the requirements for the Degree of
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ABSTRACT

Consumer's Adoption of Technology Innovations: The Role of Coping Strategies

by

BAO Wenjing

Master of Philosophy

Given the accelerated technology innovations and shorter product lifecycles, explaining and predicting consumers' adoption of technology innovations have been increasingly difficult. With new generations of the same products emerging every few years or less, consumers often face the dilemma of choosing between continuing to use the existing product and upgrading to a new version, and have increasingly experienced a certain level of technology fatigue. They may delay the adoption, frog-leap the new product, and simply ignore its existence. Thus, the traditional models of adoption based on product attributes and consumer innovativeness can no longer accommodate these new realities. Based on the concepts of uncertainty and paradoxes associated with new technologies, this study proposes a modified technology adoption model (TAM) by incorporating the concept of coping strategies, which include ignoring, rejecting, delaying, extended decision making, and pretesting.

First, this study defines the concept of coping strategies and their measurements and specifies a revised TAM. Based on a survey of 219 consumers regarding the adoption of 3G mobile services in Hong Kong, the construct validity and external validity of coping is tested using confirmatory factor analysis and multiple regression. Using structural equation modeling, the study finds that consumer' coping strategy is a significant predictor of their perceptions of product, which in turn affect consumer's adoption decision. Moreover, the profiles of consumers enacting different coping strategies are delineated. The proposed model in this research provides more coherent explanations of consumers' adoption decision process, can help build more accurate forecasting models, and furnish meaningful implications of marketing technology products to today's tech-savvy and tech-weary consumers.

I declare that this is an original work based primarily on my own research, and I warrant that all citations of previous research, published or unpublished, have been duly acknowledged.

BAO WENJING
(Date)

Response to the Examination Panel
Consumer's Adoption of Technology Innovations:
the Role of Coping Strategies

First, I would like to thank you for your valuable comments on how to revise my thesis. I have read your comments very carefully and have made many improvements to address the issues and concerns that you have raised. However, as the limitation of my data, I could not do exactly what you asked me to do. In this case, I tried my best to explain the reason behind it. I believe that by doing so, the quality and readability of the thesis has been much improved.

Revisions:

1. There is a need to make a stronger assumption or argument that new technology products would cause stress and uncertainty, e.g., due to the increasing number of product features that require a lot of learning. This can be accomplished by giving specific examples.

In my thesis, I first articulated the paradoxes caused by uncertainties of technology innovation, and these paradoxes would cause stress to consumers. Then, I brought the “techno-stress” proposed by Brod, (1984) into my research, and explained why consumers feel “techno-stress” from two perspectives: in their working settings and personal settings. There are mainly three reasons why new technology products would cause stress: 1) most technology products are complex and require a lot of consumer learning; 2) social influences such as peers and influx of advertisements influences propel consumers to adopt, regardless of their own willingness. 3) consumers’ inability to adapt to technology innovations.

Following your suggestions, I added an example (p29, para. 2) to discuss new technology products would cause stress in the working place. Also, consumers not only have to face compulsory innovations in their offices, but also have to face influx of innovation products in their on the way home and exhausted to make decisions whether to buy or not. Moreover, lots of learning and uncertainty of ability to adapt to new products would bring stress to consumers after their adoption.

2. The rationale for the role of coping strategies should be stronger. For instance, as stated, coping strategies help to deal with the stress and uncertainty and affect their product perceptions. The different theoretical frameworks can be better integrated.

In 5.4.5 of my thesis, I discussed the alternative models considering the role of coping strategies in the TAM model. By using SEM, I tested the effects of coping strategies on attitude and behavior intention respectively. The results show that coping strategies do not have direct effects on attitude and behavior intention. Thus, the results supported my proposition.

Following your suggestions, I find another research which can support our proposition on the role of coping strategy, which is Duhachek's (2005) Multidimensional Model of Consumer Coping. In this model, he elaborated two relationships: between negative emotions and coping strategies, and between coping strategies and cognitive perceptions. He suggests that consumers' consumption situation may bring negative emotions to consumers, including threat, anger, sadness, and challenge. Consumers adjust various coping strategies to handle these negative emotions, and the consequence of this coping process is that consumers may change their cognitive perceptions on products. Therefore, I add this model to my thesis to make the rationale stronger.

3. There is a need to clarify whether there are two or three broad categories of coping strategies such as avoid, confrontation, and approach. Essentially, is confrontation the same as approach or something else? What is immediate adoption, an approach or confrontation strategy? If so, how can it be integrated into the existing model?

In my thesis, I adopt the traditional taxonomy on coping strategy, which includes two categories avoid/confrontation. The reason I use confrontation instead of approach is that coping strategy refers to such situation as the person is facing or dealing with an unpleasant or difficult person or situation. Confrontation is used in such occasion, while approach is used to deal with a problem or task. Thus, confrontation fit coping strategy better than approach.

Immediate adoption is not included in my thesis. It is only used in the identifying process of coping strategy's taxonomy. In literature, coping strategies do not include immediate adoption. Also, it does not belong to any categories, neither avoid nor confrontation. Moreover, I tried to test its effect on consumers' perceived usefulness and perceived ease of use, and the results are not significant. Thus, I have not integrated it into the existing model.

4. A better explanation is needed for the insignificant effect of coping strategies on perceived usefulness. Maybe 3G phone is a continuous innovation, and its relative advantage is not obvious in comparison with the existing products. How about other factors such as fun, quality, cost, and risk? Can they be integrated into the model?

Following your suggestions:

The effects of both types of coping strategy on usefulness were found not significant. It is probably because 3G phone is continuous innovation, and its relative advantage is not obvious in comparison with the existing products. It is consistent with the Strutton, Lumpkin & Vitell's research (1994). They suggest that when marketing continuous innovations should focus on the economic advantages and ease of use associated with the product, whereas when marketing discontinuous innovation, marketing efforts should primarily focus on addressing the relative advantage and observability of the innovation. Currently, majority of Hong Kong people have more than one mobile phone, so people are prone to conceive that a 3G phone is just another mobile phone. In addition, there are too many substitutes of 3G phone in this modern society such as Internet, digital camera,

and PSP (Play Station Portable). Therefore, people may not regard 3G phone significantly more useful regardless of their coping strategies.

I previously chose only two factors: usefulness and ease of use, because TAM is decided to be the basic framework in this study as its robustness in studying technology innovation adoption. According to your suggestions, I added fun, quality, cost and risk into the current model one by one. The result is shown as below:

Major paths and model fit	Model	Current model +X (X: fun)	Current model +X (X: risk)	Current model + X (X: cost)	Current model +X(X:quality)
ACS→ ease of use:		-0.281**	-0.311**	-0.270**	-0.250**
CCS→ ease of use:		0.858**	0.246**	0.629	0.612
ACS→ usefulness:		-0.046	0.095	0.071	0.069
CCS→ usefulness:		0.459	-0.132	0.174	0.075
ACS→ X:		-0.266**	0.868**	-0.074	0.108
CCS→ X:		0.964**	0.497**	0.997	0.994
Model Fit					
CMIN/DF		2.601	2.306	2.209	2.682
GFI		0.824	0.837	0.843	0.826
AGFI		0.770	0.787	0.796	0.769
NFI		0.830	0.822	0.824	0.810
CFI		0.887	0.889	0.894	0.870
RMSEA		0.090	0.082	0.079	0.093

As shown in the table above, avoidance coping strategies has a significant negative effect on fun. Confrontation coping strategies have a significant positive effect on fun. Also, when adding fun to current model, the effects of ACS and CCS on ease of use are consistent with our expectation, but the effects of ACS and CCS on usefulness are not significant.

When adding risk to current model, the effects of ACS and CCS on ease of use are also significant and consistent with our expectation, but effects of them on usefulness are still not significant. The interesting result is that both effects of ACS and CCS on risk are significantly positive. It means no matter consumers adopt avoidance coping strategies or confrontation coping strategies, consumers would consider innovation products risky. Because confrontation coping strategies such as pretest and EDM, are used by consumers to reduce uncertainty and risk of adoption, in this sense, consumers who adopt CCS also consider innovation products risky.

When adding quality and cost into current model, the effects of ACS on ease of use in both models are significantly negative, which is consistent with our expectation. However, other relationship between coping strategies and perceptions are not significant.

Although there are some significant effects in these four models, the model fits of each model are not good. Current model, which only includes two perceptions: usefulness and ease of use are relatively better than these four models. The purpose of SEM is to test a theoretical model. Thus, these constructs including fun, quality, cost and risk are not included in the original TAM, thus will not be integrated in the final model.

5. Alternative models or other analytical methods that may help reveal the effects of coping strategies can be explored and discussed.

Please refer to answer of the second question.

6. More specific suggestions for future research with respect to the role of coping strategies should be given. As behavior predispositions, do they serve the role of antecedents, moderating factors, mediating variables or actually represent heterogeneity? How should future studies go about theorizing and analyzing the role of coping strategies?

Following your suggestion, the role of coping strategies in future research is suggested to 1) specifically be studied in different innovation categories (continuous innovation, discontinuous innovation, etc.) 2) be explored in different adoption frameworks.

As discussed in this thesis, coping strategies serve the role of antecedents of perceptions and have been discussed extensively in Chapter 3. Previously, I considered that coping strategies may moderate the effect of attitude on behavior intention. I also did hierarchical regression with interactions to test this relationship, but the results were not at all significant, because the correlation between attitude and behavior intention was too high (0.8). Thus, in my suggestions for future research, the role of coping strategy should be explored in different adoption frameworks.

7. With regard to the quality of presentation, additional work should be conducted to improve clarity in the following areas: literature on innovation adoption as summarized in Table 1 should involve an additional column covering the key findings of each study; definition of coping strategies as provided in Table 2 should provide an additional column detailing the source of information in terms of qualitative findings of Mick and Fournier (1998); and summary of respondent characteristics should be reported with the appropriate writing style.

As you suggested, I added an additional column to cover the key findings of each study. Please refer to the Table 1 (p22).

Table 2 (p32) gives a clear definition of each coping strategy used in this research. Definitions are made based on Mick and Fournier's (1998) research, but they are not the same as theirs.

(8) With regard to the accuracy of research methodology, additional considerations about research design, measurement scales, sampling method, use of analytical tests (such as t-test, ANOVA, and chi-square test) and analysis of results should be carried out.

A systematic approach over the development of measurement scales for the key construct of coping strategy is desired. It would be desirable if the steps undertaken for such a purpose are explained under the guideline of authoritative figures such as Parasuraman in his development of SERVQUAL. An explanation over whether adequate pre-testing effort has been made in developing the coping strategy construct is needed.

Following your suggestion, I improved the approach over the development of measurement scales for the key construct of coping strategy. A set of potential items was generated based on interview responses of Fournier's (1998) research and the definition of each coping strategies. First, pretest is described in 4.2 (p44). Second, scale purification is elaborated in 5.2 (p47). Also, alpha is given to each variable to show the reliability in table 3 (p49). Last, the validity is tested by CFA in 5.3 (p50).

(9) The present report of findings is not clear about how the original 60 items on coping strategies was reduced to the final version of 23 items used for model testing. Clear explanation is required here.

Items are discarded when SPSS' results of "scale if item deleted" are high. This repeated process lead to the final version of 23 items used for model testing. It is a common way to drop bad items when developing scales.

(10) The present report used ANOVA to test for significant differences between the group using confrontation strategy and the group using avoidance strategy. However, as only two groups are compared, t-test should be used instead. Besides, the individual respondent age should be re-entered in terms of age categories and then chi-square testing for significant differences should be used. In addition, the individual income categories should be collapsed into a small number of categories before chi-square testing.

Following your advice, T-test was conducted to see the perceptions differences between group using confrontation strategy and the group using avoidance strategy. Age was re-entered in terms of age categories and income was collapsed into three categories. Please refer to the thesis for details.

(11) Given the present samples covered both adopters and non-adopters of 3G mobile phone services, discriminant analysis would be an appropriate analytical method that can classify respondents into adopters and non-adopters by using coping strategies, perceived usefulness, perceived ease of use, attitude toward innovation, purchase intention, etc. as predictor variables. This serves to develop a profile of adopters and testifies whether coping strategies can indeed increase the correct classification percentage.

Discriminant analysis (DA) may help explain more differences between adopters and non-adopters. I have tried DA on my data according to your suggestions. The results show the classification error rate is very high (19%). Among the errors, false positive is

80% (adopters are misclassified into non-adopters). Thus, it is unacceptable with such high error rate.

It is because that in our data, the size of non-adopters is ten times more than the size of adopters (202 vs. 20), which lead to adverse effects on estimation and classification. Also, due to limited sample size, no validation can be conducted on the discriminant function. Thus, discriminant analysis is not used in this thesis due to the limitation of the data.

(12) The extent of reinforcement by the findings of the study on previous literature should be discussed and reported in the final chapter so as to provide some specific ideas for future research. The particular shortcomings of the current operationalization of coping strategies should provide specific directions for additional measurement effort as well.

Following paragraphs have been added to the discussion part according to your suggestion. (p70)

“Traditional adoption theory is too simple to predict the current consumers’ behavior, since previous studies neglect stress, uncertainties, and paradoxes brought to consumers by innovations. Also, previous studies have not explored how consumers’ past experiences would affect their learning styles, information search behaviors and in turn affect their perceptions towards certain innovations. Thus, there is a gap existed in previous research regarding consumer’s adoption decision process. This research bridges this gap by using coping strategy. Coping strategies influence consumers in terms of whether they would like to know about the innovations, search information about innovations, and in turn influence their perceptions on products. It is an important stage in consumers’ adoption decision process. Therefore, consumers’ coping strategies based on their past experiences play an important role in predicting the consumer’s adoption.

The measurement of the coping strategies still needs improvement. As five coping strategies discussed in our research cannot generalize all the strategies consumers would adopt, more coping strategies need to be explored. Future research can also consider the measurement of the coping strategies in psychology and develop more generalized scales. Testing the proposed measurement scales in other geographical regions and cultures is necessary to see if the model and the proposed measurement scale will hold.”

Furthermore, I did receive valuable comments from Prof. T.S. Chan and Prof. Daning Sun (Head, Department of Computing and Decision Sciences). The comments are beneficial to the thesis and are summarized as below:

(a) A better justification for the selection of 3G mobile phone services for the research should be provided.

The selection of 3G mobile phone services is because of following reasons. Since the 3G market in Hong Kong has been launched for just about two years, only a few consumers adopt the 3G service. The adoption rate is very low (about 6%) even though mobile network operators have made great efforts on promoting the brand-new technology. In addition, because Hong Kong people possess an existing familiarity with 3G phone

which would avoid compounding any effects that may result from our introduction of 3G phone to the respondents. Third reason is the relatively higher broadband penetration rate (55%) in Hong Kong and variety of contents provided by 3G service providers. Moreover, convenience of data collection is another consideration.

(b) The sampling method should be described in more details. For instance, how would the sample be drawn (sampling frame)? What are the justifications for the determination of adopters and non-adopters?

Random sample is chosen in this research. The reason why I do not use homogenous sample is because I would like to explore whether demographics such as respondents' age, education, income, job nature would affect their coping strategies.

In the questionnaire, one question asking "do you currently own a 3G phone?" serve for the determination of adopters and non-adopters.

(c) Comparison between the model with and without the coping strategies (refer to Figure 3, p.36) is required. Does coping strategy make a significant improvement on the interpretation on TAM model? This comparison will justify the incorporation of coping strategies or not.

Following your suggestions, I added TAM into the model comparison part (5.4.5, p62-63) to see whether current model makes an improvement on TAM. The SEM results of TAM (M0) are also included in the table 7. The results of model fitness show that current model (M1) may not be better than M0, because more degree of freedom is added to M1 than M0, but M1 explains adoption better and more efficient than TAM. Also, M1 and M0 are actually not nested models but two different models, so that Chi-square difference test can not be used to test the model fit improvement and the model fit of M1 is acceptable. Moreover, our focus of this research is not to improve TAM, but to explore the consumer decision process. The M1 can provide more information about consumers' behaviors than TAM. M1 proves to be the best model, which fits the data reasonably well.

(d) A complete description of the process from the original model (all the questions in questionnaire should be included there) to the final version of the model (only the variables left) should be included. Why some of the variables in the "coping strategies" are not included in the final model?

Immediate adoption is my trial and is not included in my thesis. It is only used in the identifying process of coping strategy's taxonomy. In literature, coping strategies do not include immediate adoption. Also, it does not belong to any categories, neither avoid nor confrontation. Moreover, I tried to test its effect on consumers' perceived usefulness and perceived ease of use, and the results are not significant. Thus, I have not integrated it into the existing model.

Items are discarded when SPSS' results of "scale if item deleted" are high. This repeated process lead to the final version of 23 items used for model testing. It is a common way to drop bad items when developing scales.

Thanks for your valuable suggestions.

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Special thanks go to Prof. Michael Hui at Chinese University of Hong Kong. In his advanced seminar for marketing research, I systematically and extensively learned the marketing theories, which contribute a lot to my thesis research. I am inspired by his wisdom, his passion, and sense of responsibility in both research and teaching field. I am very grateful to the Panel of Examiners of my oral examination: Prof. Nan Zhou, Dr. Patrick Poon, and Dr. Esther Li. They reviewed my thesis thoroughly and gave many valuable comments on the revision of my thesis.

I would like to thank Mr. Tang Feng for his strong support and encouragement by my side. I also want to express my appreciation to other friends, Miss Nicole Alpert, Mr. Huang Shengsheng, etc., who shared my happiness and sadness throughout my study and supported me a lot mentally.

Finally, I am sincerely thankful to my family. Without their encouragement, support and love, nothing could have been accomplished.

CHAPTER 1. INTRODUCTION

1.1 Rationale

Nowadays the pace of technology development is becoming faster and faster. Technological advancements occur constantly as companies keep introducing innovative products to consumers. Technological innovations have brought fundamental changes in many areas of consumers' life. Information communication technology has been considered as one of the most promising innovations of the last decade. Abundant new products and services have been created via the IT infrastructure, bringing about tremendous business opportunities. However, consumer acceptance of innovations has not been as warm or as fast as expected. An increasing number of innovations failed or exhibited disappointing adoption rates despite the promising forecast, such as WAP (Wireless Application Protocol), 3DO (a line of video game consoles released in 1993 and 1994), and 3G mobile phone. As the innovation products have become more advanced and people are exposed to more complex environments, the reasons inhibiting consumers' adoption of innovation products are not as apparent as before. Many factors, from the observable characteristics of innovation product itself to the unobserved factors such as the psychological processes of consumers, influence consumers' decisions. Thus, adoption of innovations remains one of the most heated topics in marketing research.

This paper focuses on technological innovations for several reasons. First, the lifecycle of technological products and services is usually short. Second, technology innovations in some cases are not driven by consumers' needs or demand of market, but by the supply side (e.g., companies that introduce innovative products to the

market). Thus, consumers do not always have a positive attitude toward the innovation products; instead, they will adopt various strategies to deal with the innovations. Third, technological innovations are more complex than other non-technological products or services, thus require a great deal of consumer learning. Fourth, the risk in the adoption decision is high, since many technological innovations today increasingly involve interaction between people and machine, and reduce the man-man interactions, which may psychologically influence consumers' sense of security. According to Rogers (1995), consumers often consider technology as a means for uncertainty reduction.

Existing studies of consumers' adoption of innovation are based on the implicit assumptions that technological innovations are always better and progressive and that consumers more or less view innovations in a similar light. However, recent research suggests that consumers may view innovations paradoxical – having a mix of positive benefits and potential negative effects on their lives. Also, innovative products emerge too rapidly. Consumers today seem overwhelmed and experience a certain degree of technology fatigue – an unrelenting barrage of products that have added questionable value to their lives (Wolf, 2001), or some kind of “innovation overload” – the ever-increasing pace of information, knowledge, and innovations may hamper the adoption of innovations (Herbig and Kramer, 1994). Consumer's technology fatigue or overload has become more common in recent years. The continuous influx of new products often leads to various stresses among consumers. Existing studies have not considered stress factors to explain consumer's adoption behavior. Thus, above issues are the main inspiration behind the study.

1.2 Purpose of the study

This research extends the Technology Acceptance Model (TAM) to

investigate the factors influencing the adoption of technology-based innovations. In particular, coping strategy, which stems from the stress management literature and is developed into an overall tendency toward technology-based innovations in this research, helps to explain consumer heterogeneity in face of innovations.

Specifically, the objectives of this research are threefold. Based upon the stress management literature, the first objective is to develop a theoretical model of attitude toward technology innovation adoption. The model would use coping strategy as the determinant factor on perceptions toward technology innovation adoption. The second objective is to develop the concept and measurement of coping strategy in the context of innovation adoption. The third objective is to investigate the effect of coping strategy on consumers' perceptions of innovation products and in turn affect their final adoption decision. We developed a theoretical model and several testable hypotheses based on it. In light of accelerated production innovation and shorter product lifecycle, coping strategy provides a more coherent explanation of consumers' adoption of technology-based innovations and can help building models that are more accurate.

1.3 Major findings

Three major findings emerged from this survey of adoption of 3G mobile communication among Hong Kong consumers. First, operationalization of coping strategies was supported by means of a pretest and subsequent data analyses. The results of confirmatory factor analysis support the validity of this concept. Second, this study found that coping strategies, which were formed through consumer's experiences with prior innovation products, were significant predictors of consumer's perceptions on innovation products. Third, the modified TAM achieved a reasonable

goodness of fit measure, indicating the plausibility of the model. The results of structural equation modeling revealed the significant effects of coping strategies in affecting consumers' perceptions of 3G services such as perceived usefulness, perceived ease of use, thus could contribute to Technology Acceptance Model. Specifically, consumers with confrontation coping strategies might consider 3G services more useful, more fun, much easier-to use, and had higher innovativeness than those with avoidance coping strategies. The results of the study indicate that coping strategies play a significant role in consumer adoption of technology products. Marketers need to consider such factors when targeting new technology products to consumers.

1.4 Organization of the thesis

This thesis is organized into five chapters. A brief description of each chapter is as follows. Chapter 2 articulates the impetus for studying consumer's innovation adoption, reviews significant existing literature and provides the theoretical underpinnings for the thesis. Chapter 3 explains the necessity to bring in coping strategy in innovation adoption field and gives it a clear definition and typology. A conceptual model is developed. Accordingly, five hypotheses are elaborated. Chapter 4 discusses the operationalization of variables, survey design, data collection method, analysis method for testing the proposed model. Chapter 5 presents the results of the statistical analysis of data. All findings relevant to the study's hypotheses are presented in appropriate tables and figures. Chapter 6 reviews and discusses the findings and conclusions of this study. Theoretical and practical implications of the results as well as limitations are discussed. Lastly, directions for future research are suggested.

CHAPTER 2. LITERATURE REVIEW

The purpose of this chapter is to discuss the background of this research and review academic literature in order to establish a theoretical framework and provide a basis for viewing this study's results in relation to established theory and/or previous findings.

2.1 Research background

Since the emergence of the first computer, the world has jumped into an era of innovation boom in the area of high technology. The pace of innovation has increased dramatically since the late 1960s, especially in information processing and communications technologies (White, 1996). Shortening product life cycles, rapidly changing technology, and increasingly diverse markets are making adoption more difficult to explain and predict than ever before. In addition, recent technological changes have altered the nature of consumer's interactions with various products or services. For example, with ATM and online banking or mobile banking, physical location and face-to-face interactions have been reduced dramatically. New technologies increasingly affect everyone, but not all individuals view this trend as positive. Some people welcome technological changes and the subsequent uncertainty and enjoy the challenge. Others are uncomfortable with technological changes, concerned with the uncertainty and are reluctant to embrace these new tools and services (Edison and Geissier, 2003). Take Internet for example, despite the Internet serves as a means to connect people with each other through chat rooms, and other chatting tools such as ICQ, MSN, etc, excessive use of the computer tends to

lead to social isolation, depression, and loneliness. In this case, consumers are heterogeneous in terms of not only the adoption decision (yes/no, or the time of adoption), but also perceptions and attitudes of the innovation product.

According to Rogers (1995), "innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption". Robertson (1976) classifies innovations based on their impact on behavior and social structure into continuous, dynamically continuous, and discontinuous. Continuous products are slight modifications to existing products or services (e.g. a new flavor for toothpaste), whereas dynamically continuous innovations may involve the creation of a new product or service or modifications to existing ones (e.g. conference calling, wide-screen laptop). Discontinuous innovations represent the creation of previously unknown products that usually require a significant amount of new learning, such as digital cameras and videoconferencing. Recently, an additional innovation level has been proposed, namely multigenerational innovations, which are new versions of existing products or services, such as operating systems (Windows 95/98/2000/XP) or mobile phones (2.5G/3G Mobile phone). The innovation classification scheme is of importance when considering adoption behavior since the innovation type will directly affect the level of consumer or society's interest and the kind of knowledge that is transferred to the new products/services (Saaksjarvi, 2003).

Hirschman (1980) suggests that consumers have difficulty in following changes when innovation is introduced before consumers are ready. In addition, when innovative alternatives emerge too rapidly, consumers may experience "technology fatigue" or "innovation overload" and may refuse to adopt innovations. Therefore, studying the behavior of customer adoption of new technology-based innovations and predicting their behavior has been the subject of extensive

investigations. In this field, the innovation diffusion and innovation adoption are two main streams that supplement each other. The following section 2.2 will first discuss traditional buyer behavior from diffusion perspective. Then, the literature on the adoption perspective is described in subsequent section 2.3.

2.2 Diffusion of innovation

The extant literature on the innovation diffusion is vast and multi-disciplinary, so we focus on the major theories and studies. Studies within this area try to identify the patterns and rates of adoption of innovation from a macro view. Rogers (1995) defines innovation diffusion as a process by which an innovation is communicated through certain channels over time among the members of a social system. Given this definition, the diffusion process consists of four key elements: innovation, communication channels, time, and the social system. Many studies have identified the main factors that encourage diffusion of an innovation from these four perspectives. They include achievement of competitive advantage, reducing costs, and protecting an organization's strategic position (Johannessen et al., 1999). Among the numerous studies, two major models, namely Bass model and Rogers' model, have received considerable attention.

2.2.1 The Bass model

The diffusion paradigm views the communication process as the main driver of new product growth. The Bass model (1969) assumes that potential adopters of an innovation are influenced by two means of communication—mass media and word of mouth. Adopters of an innovation comprise two groups. One group (“innovators”) is influenced only by the mass-media communication (external influence) and the

other group (“imitators”) is influenced only by the word of mouth (internal influence). Largely, internal effects constitute the market reaction to the product. If the product is well received, then word of mouth and imitations will carry forth the message. Bass, then, developed the density function of time to adoption and the cumulative fraction of adopters, and the S-shaped cumulative adoption curve, based on the premise: $f(t)/[1-F(t)]=p+qF(t)$ (p : the coefficients of external influence, q : the coefficient of internal influence). Drawing from the Bass’ research, marketers use diffusion models to explain the pattern of cumulative adoptions across time. This process is generally described in terms of acceptance rates among influential leaders and subsequent adopters.

Following Bass’s (1969) model, several estimation procedures (e.g., Sultan, Farley, and Lehmann 1990) are proposed to estimate the Bass model parameters (p and q). In addition, studies have developed many different types of diffusion models to address issues related to sales growth of innovation products, such as the effects of price and advertising on diffusion (Bass, Krishnan, and Jain 1994), and intergeneration diffusion (Norton and Bass, 1992).

2.2.2 Rogers’ model

Rogers (1983, 1995) proposes a theoretical framework that reveals the relationship between perceived innovations attributes and the rate of adoption. It is regarded as an important theory to understand the adoption behavior of potential adopters and to predict the adoption of technological innovations. The rate of adoption is defined as “the relative speed with which an innovation is adopted by members of a social system”. Rogers used five perceived innovation attributes to predict the rate of adoption: relative advantage, compatibility, trialability, observability and complexity. He suggests that one’s adoption of an innovation

depends on how one perceives the innovation as “better than the idea it supersedes” (relative advantage), “consistent with the existing values, past experiences, and needs of potential adopters” (compatibility), and easy to understand and use as opposed to difficult (complexity). He also suggests that adoption of the innovation increases when a consumer has an opportunity to try it before actual adoption (trialability), and when the results of the innovation are visible to others (observability).

As the five attributes measure different perceptions of the potential adopters, the predictive power of perceived innovation attributes has been found to be different. Rogers (1995) suggests that relative advantage is one of the best predictors of an innovation’s rate of adoption, while compatibility is relatively less important. In Tornatzky and Klein’s (1982) research, they concluded that relative advantage and compatibility are not always related consistently to the rate of adoption in a positive direction. Many studies have examined these five facilitators. The findings generally support Rogers’ proposition that the complexity has a negative influence on facilitating the adoption of innovation, while the other four facilitators have positive effects (Ferle, Edwards and Mizuno, 2002).

Rogers (1983) has articulated that the adoption curve should have a normal distribution because of interpersonal interactions. Using two basic statistical parameters of the normal distribution (mean and standard deviation), Rogers has proposed an adopter categorization dividing adopters into five categories, namely, Innovators, Early Adopters, Early Majority, Late Majority, and Laggards, with 2.5%, 13.5%, 34%, 34%, and 16% of the population respectively. This adopter segmentation, which is built on innovativeness, has been largely based on personal characteristics. For instance, innovators are described as venturesome, young, having more cosmopolite social relationships, and having a high degree of innovativeness.

Abundant empirical studies related to Rogers' diffusion of innovation theory can be classified into three categories: the operationalization of the innovativeness construct, characteristics and behaviors of innovation adopters across diffusion stages, and the validation of the elements derived by Rogers to facilitate the adoption of innovation (Martinez, Polo, and Flavian, 1998).

Both personal characteristics and innovativeness have received considerable attention in academia. Many studies use these variables to classify adopters. Studies of the adoption process mostly classify adopters according to the moment at which they adopt an innovation. In this way, adopters can be grouped into categories in such a way that a given category will reflect individuals that are homogeneous within the group and heterogeneous with respect to all the other groups. Combining with perceived innovation attributes, these studies have reached a consensus on the profiles of these adopter groups (Eastlick and Lotz, 1999). Despite the attention given to individual characteristics, however, several studies have documented that their effects on adoption are weak (Lockett and Littler, 1997, Holak, 1988). Moreover, the traditional personality variables of the innovators seem to be less appropriate for technological innovations. Dickson and Gentry (1983), for instance, found that early adopters of home computers tended to be "logical introverts" in contrast to the social, cosmopolitan view of innovators.

As the strategic and financial importance of launching new products increases, a better understanding of the consumer's adoption process and the factors affecting it can lead to more effective segmentation, positioning, and launching strategies. Recently, a central factor that was found to influence the adoption process is consumers' existing product category knowledge. Results from both consumer behavior and psychology indicate that prior knowledge influences both the cost and

the content of thinking (e.g., Bettman, Johnson, and Payne 1990; Gregan-Paxton and John 1997; Moreau et al 2001). Similarly, the diffusion literature suggests that both the cost and the content of thinking, in turn, influence diffusion speed and success (e.g., Gatignon and Robertson 1985; Robertson 1971; Rogers 1983).

2.3 Innovation adoption

Previous research on the innovation adoption in a micro view focuses on exploring the characteristics of new products which affect adoption (whether adopt or not, the time of adoption, etc.). In addition, demographics (e.g., age, income, and education) and psychographics (e.g., opinion leadership and information search behavior) are intensively used to profile consumer adopters (Turnball and Meenaghan, 1980; Dawar, Parker and Price, 1996). Above-mentioned researches serve as a basis of current study. The theoretical models pertinent to this research are the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975), Technology Acceptance Model (TAM) by Davis (1989), and Innovation Diffusion Theory by Rogers (1962). The innovation decision process (Roger's, 1995) involves the formation of attitudes towards the innovation. As a result, the attitude literature can provide further theoretical underpinnings for the current research and can enhance our understanding of how attitude is formed. A widely accepted model of attitudes is the Theory of Reasoned Action (TRA).

2.3.1 Theory of Reasoned Action

The Theory of Reasoned Action (TRA), proposed by Fishbein and Ajzen, (1975), has been successful in predicting the behavioral intent to purchase goods in many different settings (Sheppard, et al. 1988). Marketing studies have long used this

theory to explain buyer behavior. The TRA theory focuses on behavioral intentions rather than attitudes as the main predictor of behavior. It proposes that behavior can be predicted from behavioral intention, attitude, and subjective social norms. All other external influences like demographic variables and personality traits are mediated by above three variables. Figure 1 is the proposed model of TRA.

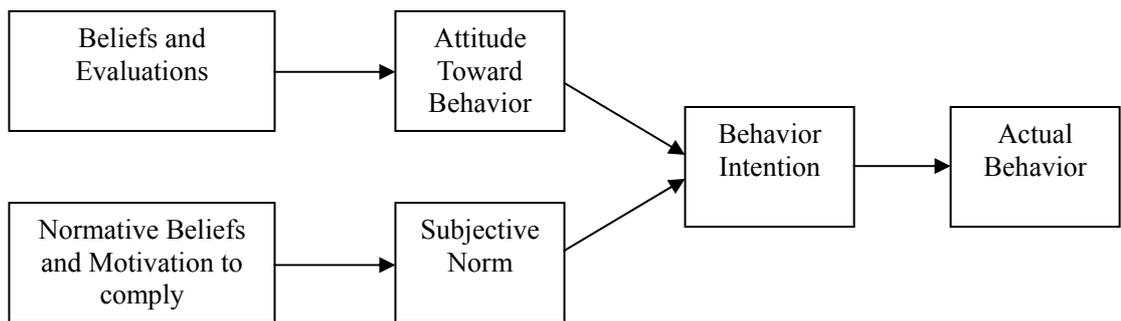


Figure 1. Theory of Reasoned Action (TRA)

According to the above conceptual framework, TRA includes four relationships. First, the actual behavior of a person is determined by his/her behavioral intention (BI). BI measures the strength of a person’s intention to conduct a specific behavior. Second, BI is determined by the person’s attitude (A) and subjective norm (SN): $BI=A+SN$. Attitude is defined as “an individual’s positive or negative feelings (evaluative affect) about performing the target behavior.” SN is defined as “the person’s perception that most people who are important to him think he should or should not perform the behavior in questions.”

Third, attitude is determined by salient beliefs (b_i) about consequences of performing the behavior multiplied by the evaluation (e_i) of those consequences: $A=\sum b_i e_i$. Salient beliefs (b_i) are defined as “the individual’s subjective probability that performing the target behavior will result in consequence i.” The evaluation term

(e_i) is defined as “an implicit evaluative response to the consequence.” This equation suggests that external stimuli influence attitudes only indirectly through changes in the person’s belief structure. Moreover, SN is determined by a person’s normative beliefs (nb_i), that is, perceived expectations of specific referent individuals or groups, multiplied by his or her motivation to comply (mc_i) with these expectations: $SN = \sum nb_i mc_i$. Finally, Fishbein and Ajzen, (1975, 1980) argue that any other factors that influence behavior do so only indirectly by influencing A, SN, or their relative weights.

Another major contribution of TRA is that consumer perceived innovation characteristics influence attitude, not the product characteristics themselves. Theory of Reasoned Action has received considerable empirical support in predicting a wide range of human behavior (Sheppard, Hartwick, and Barki 1988, Karahanna, Straub, and Chervany, 1999). It can help predict consumer’s intention to use a product. Interestingly, TRA is not found as useful in predicting technology usage.

As the Theory of Reasoned Action began to draw continuously increasing attention in innovation adoption field, Ajzen and other researcher realized that this theory was not adequate (Godin and Desharnais, 1992). One of the limitations was that people do not always have much control over their behaviors and attitudes. Ajzen (1985) added perceived behavioral control to the original theory, which resulted in a new theory known as the Theory of Planned Behavior (TPB). The major difference between TRA and TPB is that perceived behavioral control is proposed to be a third determinant of behavioral intention. Perceived behavioral control “reflects beliefs regarding access to the resources and opportunities needed to perform a behavior, or alternatively, to the intention and external factors that may impede performance of the behavior” (Ajzen, 1985). It is determined by two factors: control

beliefs and perceived power. If a person has strong control beliefs about the existence of factors, which facilitate a behavior, he/she will have high-perceived control over a behavior, and vice versa. This perception is a reflection of past experiences, anticipation of upcoming circumstances, and attitudes of the influential norms that surround the individual (Argabright, 2002). The model has been found to be generally supported, and perceived behavioral control is also found an important predictor of behavioral intentions (Ajzen and Driver, 1992; Doll and Ajzen, 1992).

2.3.2 Technology Acceptance Model

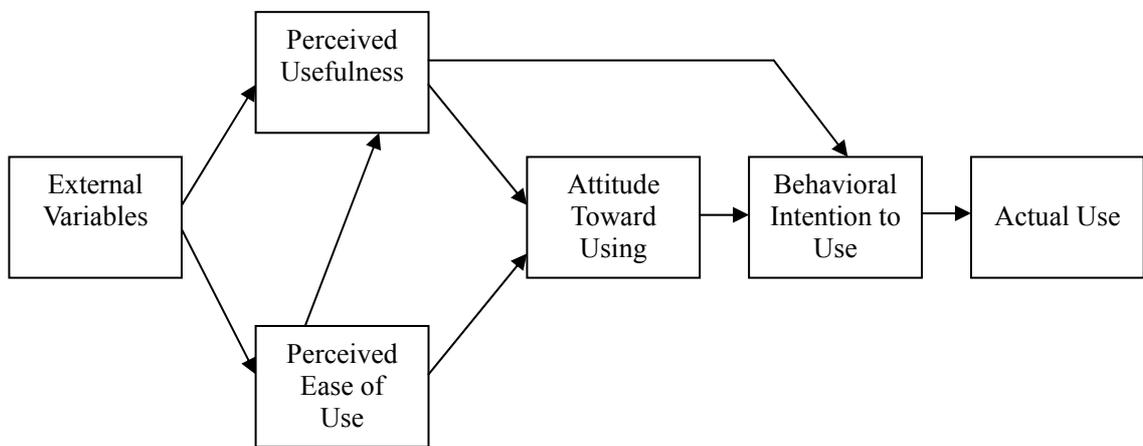


Figure 2. Technology Acceptance Model (TAM)

Since TRA was not found as useful in predicting technology usage, Davis (1989) extended TRA to a very influential model to study employee’s adoption of computer technology in the workplace: the Technology Acceptance Model (TAM). This theory provides a powerful and parsimonious explanation for user acceptance of technological innovations. The TAM, shown in Figure 2, suggests that when a new technology is introduced to users, beliefs about usefulness and ease of use are essential elements in determining a user’s attitude to using a technology. The former is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance” and the latter as “the degree to which a

person believes that using a particular system would be free of effort”. Attitude in turn positively affects consumers’ usage intention (Davis, 1989). This model was empirically tested in a longitudinal study of 107 users’ intentions to use a specific system. The results supported proposed concepts and relationships in TAM. Particularly, perceived usefulness was found to have a strong influence on people’s attitudes, while perceived ease of use had a smaller but still significant effect.

The TAM is cited frequently by those studies that examine the acceptance of information technologies and technology based innovations. Referring to Table 1, several studies empirically test TAM, including Davis et al. (1989), and Adams et al., (1992). Doll, Hendrickson, and Deng (1998), by using two software packages, proved the high degree of reliability of the perceived usefulness and perceived ease of use scales. O’Cass and Fenech (2003) point out that, although TAM is specifically tailored to the acceptance of computer-based technologies, “its robust and parsimonious structure has allowed applications in other technological adoption situations with appropriate adjustment”.

TAM has been utilized in numerous settings involving various forms of technological adoption (Venkatesh and Davis, 2000). As shown in table 1, a number of modified TAM models were proposed recently by studies to suit new technologies including Internet, intranet and World Wide Web (e.g. Agarwal and Prasad, 1998; Chau, 1996; Chau and Hu, 2001; Horton et al., 2001; Hu et al., 1999; Jiang et al., 2000). Various constructs are incorporated into the TAM such as situational involvement (Jackson et al. 1997), long-term and near-term perceived usefulness (Chau, 1996), self-efficacy (Igbaria and Ilivari, 1995; Fenech, 1998), gender (Gefen and Straub, 1997). In the consumer context, Childers et al. (2006) found that enjoyment had a significant effect on Internet shopper’s attitudes, and was a more

powerful determinant of attitudes toward usage than the perceived usefulness of the device, and accordingly developed a c-TAM (Bruner and Kumar, 2005). Some studies test the TAM by incorporating compatibility, relative advantage into it (Agarwal and Prasad, 1998; Al-Gahtani and King, 1999).

As shown in Table 1, several studies subsequently compared TAM, TPB and TRA (Davis, Bagozzi, and Warshaw, 1989; Mathieson, 1991; Taylor and Todd, 1995; Chau and Hu, 2001). Davis, et al (1989) compared TAM and TRA in their research. Their results suggested that TAM predicted acceptance better than TRA. Subjective norm in TRA was found no effect on intentions to use. Mathieson (1991) found both TAM and TPB predicted intention to use quite well. TAM is easier to apply but only supplies very general information. TPB provides more specific information. Taylor and Todd (1995) also compared TAM, TPB and the decomposed TPB. They pointed out that these three models performed equally well in their ability to explain behavior. Although the decomposed TPB provides a fuller understanding of behavioral intention by focusing on the factors likely to influence usage such as design and implementation strategies, it is more complex and difficult to measure.

Overall, the technology acceptance model (TAM) is believed most robust, parsimonious, and influential in explaining IT/IS adoption behavior (Davis, 1989; Davis, et al., 1989; Igarria et al., 1995). Studies suggest that, other than utilizing feelings or attitudes to explain the acceptance of a particular technological innovation, “external variables” may be added to TAM as a way of improving the model’s predictive power (Davis, 1993; Davis et al., 1989). In the marketing field, various external variables have been suggested, such as consumer skill/expertise, personality characteristics, various demographic variables (Mattilia et al., 2003), computer anxiety (Harrison and Rainer, 1992), perceived self-efficacy and credibility (Wang et

al., 2003).

2.3.3 Rogers' theory

Although demographics and psychographics of consumers and perceived innovation attributes have been explored to predict consumers' adoption of new products or services, one possibly important factor that has been ignored is consumers' prior experiences with the previous innovations. Rogers mentioned the prior experience in his innovation adoption theory (1995), which provided some insights for understanding consumers' decision-making process.

Rogers (1995) proposed a model describing the five-stage process of decision making for innovation adoption, *knowledge*, *persuasion*, *decision*, *implementation*, *confirmation*, respectively. In knowledge stage, consumers are exposed to the innovation's existence and gain some understanding of how it functions. In the persuasion (attitude formation) stage, consumers form favorable or unfavorable attitudes toward the innovation. Consumers engage in activities that lead to a choice to adopt or reject the innovation in the decision stage. In the implementation stage, consumers put an innovation to use. Finally, consumers seek reinforcement for their innovation decision, but may reverse this decision if exposed to conflicting messages about the product in the confirmation stage. Through this process, Rogers suggests prior experience plays an essential role in the first stage *knowledge*. Prior conditions such as previous practices (i.e., prior experience with Internet) and personal characteristics (i.e., demographic characteristics) will influence knowledge formation.

Rogers (1995) also suggests that prior practice with an innovation is essential in building how-to knowledge and enhancing observability and trialability of the innovation, which are important in the knowledge and early persuasion stage. Based on prior experience with an innovation, consumers build more knowledge and

stronger belief of the innovation. A direct effect of prior experience on behavioral intention is also found in some other studies (e.g., Doll and Ajzen, 1992). These studies implicate that past experiences of consumers interacting with innovations have as equal if not less effect as those demographics or psychographics or perceived innovation attributes.

However, the measurement of prior experience in previous research was not sufficient. It was measured with only two items: length of time spent using the innovation and frequency of using the innovation, both of which are used for measuring quantity of prior experiences, ignoring the outcome of experiences: whether consumers are satisfied or dissatisfied with the adoption of previous innovation products. In addition, it is not easy to measure the outcome of prior experience. It is difficult to trace prior experiences given the uncertainty regarding the number of experiences (how many innovation products a consumer has adopted), the number of positive and negative experiences (how many times a consumer is satisfied and dissatisfied), how these experiences affect consumer's attitudes, and how consumers feel after receiving a product/service recovery from the vendors.

As TRA, TAM and Rogers' theory of innovation adoption have gained extensive attention in this field; many studies incorporated these variables and developed their own models to study the decision process of consumers. Table 1 summarizes the important studies concerning TRA, TPB, TAM, and Rogers' innovation adoption theory. Eunah Yoh et al. (2003) integrated TRA and Rogers' theory into a model of adoption of the Internet for apparel shopping. They found psychological factors (beliefs and attitude), social factors (social support and social acceptance) and prior experience were significant in explaining intention to purchase apparel via the Internet. Among them, prior experience with the Internet had the

strongest influence. Saaksjarvi (2003), by studying the interaction between consumers' knowledge and compatibility, found four adopter groups: technovators, supplemental experts, novices, and core experts.

2.4 Summary of previous research on innovation adoption

Although previous studies have emphasized the heterogeneity among consumers in terms of their propensity for adoption as influenced by both product factors and consumer characteristics, they have been largely based on the implicit assumption that technological innovations are always better and progressive and that consumers more or less view innovations in a similar light. Consumer heterogeneity has been accounted for by factors such as consumer innovativeness and demographics or are modeled unobservable as in random parameter models. However, previous literature did not pay enough attention to consumers' past experiences with innovation products. Since nowadays innovation product/service is sometimes not designed to meet consumer's needs, but to create consumer's needs, consumer's past experiences with previous innovation products deserve more attention. Consumers may easily get disappointed and lose confidence in the marketers, if successive innovation product/services continuously create new needs but cannot satisfy them.

Moreover, previous literature neglects a key factor in consumer's decision process in the knowledge and persuasion stage. What is the key factor to influence consumer's desire to know innovation product/service, what leads to consumer's willingness to recall their existing knowledge to form perceptions of innovation product/service, what inhibits their interest to do so? In other words, how can we

characterize consumers' prior experience, which may affect their perception and processing of information related to the new product? Thus, there appears to be a missing link in the existing literature regarding the effect of prior experiences. Furthermore, existing research has largely treated adoption as a choice variables (adopt or not) or as a general tendency (likelihood of adoption). Such models cannot explain the more complex adoption behaviors that exist, such as delayed adoption and skip-generation adoption, etc.. Apparently, there is a need for alternative theoretical explanations for the increasingly complex behaviors in the adoption process.

Table 1. Literature on Innovation Adoption

Year	Author	IV	DV	Research Findings
1989	Davis	Perceived usefulness, ease of use	Usage	<ul style="list-style-type: none"> · scales for usefulness and ease of use are developed and validated. · usefulness and ease of use are significantly correlated with current usage and future usage.
1989	Davis et al.	Perceived usefulness, ease of use, subjective norms	Intention to use, attitude	<ul style="list-style-type: none"> · usefulness and ease of use are the most important factor related to individual intentions. · behavior intention is a reasonable basis for predicting future use.
1991	Mathieson	Ease of use, usefulness, subjective norms	Attitude, bi, behavioral control	<ul style="list-style-type: none"> · comparing TAM and TPB: TAM is easier to apply, but only supplies very general information on users' opinion about a system. TPM provides more specific information that can better guide development.
1992	Adams et al.	Ease of use, usefulness	Usage	<ul style="list-style-type: none"> · measurement of usefulness and ease of use are reliable and valid.
1993	Davis	System design features, perceived usefulness and ease of use,	Attitudes toward using, actual system use	<ul style="list-style-type: none"> · computer training methods have no effects on consumers perceived ease of system use.
1995	Taylor and Todd	Compatibility, peer influence, superior's influence, self efficacy, resource facilitating conditions, technology facilitating conditions, perceived usefulness, ease of use, subjective norms, perceived behavioral control	Attitude, BI, usage behaviors	<ul style="list-style-type: none"> · decomposed theory of planned behavior provides a fuller understanding of behavioral intention by focusing on the factors that are likely to influence systems use through the application of both design and implementation strategy.
1996	Chau	Near-term and long-term usefulness,	BI	<ul style="list-style-type: none"> · near-term usefulness had the most significant

Table 1. Literature on Innovation Adoption (Continued)

Year	Author	IV	DV	Research Findings
		ease of use		influence on the behavioral intention. · long-term usefulness also exerted a positive, though lesser, impact.
1998	Agarwal and Prasad	Relative advantage, ease of use, personal innovativeness, computer playfulness	BI	· personal innovativeness has moderating influences on the relationship between perceptions and adoption decisions.
1999	Hu et al.	Perceived usefulness and ease of use	Attitude, Intention to use	· usefulness is a significant determinant of physicians' attitude and intention to accept telemedicine technology but perceived ease of use is not.
2001	Horton et al.	Usefulness, ease of use	Intention to use, self-reported usage	· TAM is predictive of intranet use.
2001	Venkatesh and Davis	Voluntariness, experience, subjective norm, image, job relevance, output quality result demonstrability, usefulness, ease of use	Attitude, BI	· social influence processes and cognitive instrumental processes significantly influence user acceptance.
2003	Yoh et al	Social support, social acceptance, prior experience	Attitude and BI	· prior experience with the internet had the strongest influence on intention to purchase apparel through internet.
2003	Lee et al	Perceived beliefs, reliability, security, complexity, trialability, observability	adoption	· a significant sample selection bias was found with regard to access when estimating consumer adoption of a relatively new innovation, like computer banking, but no such bias was found for a mature innovation, like ATM.

Table 1. Literature on Innovation Adoption (Continued)

Year	Author	IV	DV	Research Findings
2003	Lu et al	Near-term and long term usefulness, ease of using, complexity, individual differences, facilitating conditions, social influence, wireless trust environment	Attitudes towards using, bi	· TAM for wireless internet proposes that constructs such as technology complexity, facilitating conditions, social influences and wireless trust environment determine usefulness and ease of use, in turn determine intention.
2003	Saaksjarvi	Knowledge, compatibility	Adoption likelihood	· develop four adopter groups: technovators, supplemental experts, novices, core experts · adoption is determined by interaction of knowledge and compatibility
2004	Kleijnen et al	Perceived usefulness, ease of use, costs, system quality, computer skills, mobile technology readiness, social influence	Attitude, intention to use	· factors influencing the wireless finance adoption: system quality, social influence. Moderating effects: age, computer skills, mobile technology readiness and social influence.
2004	Keat and Mohan	Usefulness, ease of use, trust	Attitude, BI	· TAM with trust is adequate and efficient to assess users' acceptance of e-commerce.
2005	Bruner Kumar and	Usefulness, ease of use, fun	Attitude, BI	· in consumer context, TAM with fun contributes more in predicting consumers' adoption of handheld Internet devices.
2005	Kalliny Minor and	qualitative		· both hedonic and utilitarian considerations are important factors in intention to use m-commerce.
2006	He et al	Perceived relative advantage, compatibility, complexity, trialability, observability	Likelihood of adoption	· only perceived compatibility has significant influence on online e-payment adoption of Chinese companies.

CHAPTER 3. DEFINITIONS AND THEORY DEVELOPMENT

As Rogers (1995) posits, prior experiences with innovations are essential in the knowledge and early persuasion stage. As a corollary, consumers' coping strategies that are formed based on their prior experiences should be considered at these two stages. This study focuses on the role of consumers' coping strategies, which take prior experience into account but can help avoid exploring the uncertainties of past experiences.

3.1 Technology paradoxes and techno-stress

Innovation literature has largely relied on Rogers' (1962) classification of adopter segments (innovators, early adopters, early majority, late majority, laggards) for identifying consumers' adoption propensity. This classification suggests that marketers should target new products to innovators who start the diffusion process. This view, however, has been challenged in recent years by several researchers. Goldsmith and Hofacker (1991) suggest that the time-of-adoption method for measuring innovativeness is a temporal concept that cannot be used for predicting future behavior. Mick and Fournier (1998) posit that the predilection of the diffusion paradigm invariably characterizing the late majority, laggards, and rejecters as homogeneous groups of technology resisters is oversimplified and even condescending. Since too often technological developments are promoted just because they are available, not because they are needed, more than often, consumers have their ample reasons to be cautious and skeptical. Boyd and Mason (1999) argue that targeting the majority might be more fruitful than targeting innovators.

By means of questionnaires and phenomenological interviews, Mick and

Fournier (1998) find that consumers recognize although technology products are unavoidable, they also have paradoxes. They conclude with eight paradoxes of technological products: control/chaos, freedom/enslavement, new/obsolete, competence/incompetence, efficiency/inefficiency, fulfills/creates need, assimilation/isolation, engaging/disengaging. Control/chaos means technology can facilitate regulation or order; meanwhile technology can lead to upheaval or disorder. For example, a garbage disposal yanked an artist's hand into its reeling blades. Freedom/enslavement describes the situation that in a way once one get used to having any technology, one cannot live without it. New/obsolete, as its name shows, new technologies provide the user with the most recently developed benefits of scientific knowledge, but soon they will be outmoded after they reach the marketplace. Competence/incompetence means that technology can facilitate feelings of intelligence or efficacy; meanwhile, it can lead to feelings of ignorance or ineptitude. Technology helps people do what they could not do without; at the same time, the more technologically advanced the product is, the more difficult it is for the average layman to understand how it works, what it is going to do, and how it does it.

Efficiency/inefficiency, another major paradox, refers to the fact that technology products not only save time but can also consume time. Juicer appliance takes half an hour to make the juice, but takes another day to be cleaned. Fulfill/create means that technology can fulfill needs or desires, and lead to the development or awareness of needs previously unrealized. Assimilation/isolation more than often is in relation to television and computers. Television brings a family together around a TV set, but leads to less conversation and interaction. Engaging/disengaging asserts that technology can facilitate involvement or activity, but it also leads to disruption or passivity. For example, the Internet can easily

connect people from different places, but it depersonalizes the experiences, as they are not as natural as direct contacts with people. It may also isolate or disengage people, such as playing online games for hours.

Mick and Fournier (1998) suggest that technology is not always beneficial but rather paradoxical. Technology paradoxes are likely to provoke conflict and ambivalence that stimulate anxiety and stress. A typical type of stress identified by (Brod, 1984) is known as techno-stress. It is a modern disease of adaptation caused by an inability to cope with the new information technologies in a healthy manner. Weil and Rosen (1997) expand the conceptualization of techno-stress as a disease by suggesting that any negative impact on attitudes, thoughts, behaviors, or body psychology caused directly or indirectly by technology solicits a form of human reaction involving change due to its influence.

Thus, stress is another factor that may inhibit consumer's adoption of innovation products. Many consumption encounters are inherently stressful. From coping with poor service or product failure to making difficult purchase decision, consumers frequently encounter stressful consumption episodes (Duhachek and Iacobucci, 2005). New technologies are consistently being introduced into the workplace and home at an increasing pace. They are created to make life more convenient and easier, but on the other hand, they may subject consumers to lots of consumer learning. Consumers have to squeeze time from their busy lives to learn the 100-page manual of a new product, since product features of technology innovations are continuously increasing. Even if consumers themselves pay little attention to the continuously emerging innovations, social influences such as superior's influence, peer influence, and other people's opinion will continuously influence consumers' opinion on each innovation, and in turn, cause stress and

pressure to consumers. In some cases, people might use an innovation product to comply with others' request rather than their own feelings and beliefs. In Japan, young people treat smart-phones as new fashion items to show off in public.

In stress management literature, coping strategy draws extensive attention to study employee's reaction to stress. In the working place, various stresses can have very serious consequences for corporations and the society and can negatively affect employee's health, job satisfaction, and the work process. What is worth mentioning is the source of employee's stress. Weil and Rosen (1997) find top five complaints from employees in their survey: system problems, computer errors, the efforts it takes to learn new technology, the reality that time-saving technology seems to require more work rather than less work, and the fact that technology is always changing too fast to keep pace with. Mary is an account executive in an insurance company and has been informed that a customer relationship management system (CRM) is to be installed in her office to handle account information. She is so frustrated with this news, as she already feels stressful with meeting quota every month and now she cannot handle additional work such as spending her meeting time with potential customers on learning the system and input customer information.

We can see from Weil and Rosen's (1997) study that a major part of employee's stress comes from their inadaptability to adapt to technological innovations. Employees not only have to face the changes in their working environment all the time, but also face rapidly evolved innovations in the consumer market. All of the above-mentioned sources of stress in working place also happen at home. John Naisbitt (1983) has noted that "change is occurring so rapidly that there is no time to react." Other than techno-stress, stressful life circumstances may initiate, intensify or change people's consumption activities to handle stress (Mathur

and Moschis, 1999).

Thus, introducing coping strategy into innovation adoption research has several meaningful theoretical and practical implications, as consumers adopt them to cope with paradoxes and techno-stress. Coping strategy stems from the interpersonal stress management literature on the etiology. Many studies on this issue focus on coping with negative life events such as stress and fatal disease, but the use of coping strategy in the context of innovation adoption has received limited research attention. However, since various technology-based innovations emerge from time to time, consumers experience increasing uncertainties and are forced to cope. Coping strategy has become an important factor in the study of consumers' innovation adoption behavior (Mick and Fournier, 1998).

3.2 Coping strategy

3.2.1 Formation, definition, and taxonomy of coping strategy

Prior experiences with innovation products or services might influence the adoption of an innovation (Carlson and Zmud, 1999; Roger, 1995). As stated by Citrin et al. (2003), this is a logical outcome as heavy users of a product, service or system have acquired the ability or knowledge to predict outcomes for a closely related product/ service/ system. The traditional innovation adoption theory ignores the phenomenon that adoption of a new technology may affect or even totally change the way of human's living status, so people always adopt some kinds of coping strategies to adapt to such changes brought by innovations. In addition, prior experience not only affects consumers' knowledge structure and their ability to use innovation product, but also affects their confidence in technology and innovations.

Every time after a consumer buys an innovation product, he/she will experience a certain level of satisfaction or dissatisfaction. Satisfaction with an innovation product will influence a consumer's decision on a subsequent purchase occasion when facing another new product. However, if an innovation product brings unhappy experiences to a consumer, his perceptions or attitude of innovations will be affected. Pessimistic consumers may totally deny any advantage of the new product; and even the most optimistic consumers would possibly start to suspect whether the products are of any benefits.

To avoid or decrease uncertainty, stress, and paradoxes brought by innovation products, consumers will adopt different coping strategies from their instinct or as a habitual response. Zeitlin et al. (1987) suggest that coping strategies are influenced by one's beliefs, values, and expectations as they have been developed through experience over time. As consumers' experiences with previous innovation products accumulate to a certain amount, we expect that consumers will form certain coping strategy patterns when they face an innovation product. Consumers' coping strategies dealing with past innovations would form habits and consequently affect their willingness to approach an innovation product/service, their perceptions of it, which in turn affect their final adoption decision. In this sense, coping strategy in our research is rather a habit than a real particular "strategy". We define it as a process habit of executing a mind response to an innovation product/service. It means that in a certain period, a person will adopt a single and relative consistent coping strategy to cope with innovation products that have emerged during that period. Duhachek (2005) suggests that consumers may hold enduring coping predilections, and segmentation of consumers according to their coping styles and consequences of these styles are meaningful for consumer theory.

In stress management literature, many studies have focused on the taxonomy of coping strategies. One taxonomy is developed by Amirkhan (1990). His research revealed three fundamental coping strategies: Problem Solving, Seeking Social Support, and Avoidance. Some other studies simply categorized coping strategy as either avoidance or withdrawal (McDonald and Korabik, 1991), which is widely accepted by other studies (Lim and Teo, 1996). In accordance with Mick and Fournier's (1998) taxonomy: avoidance/confrontation when facing technology paradoxes, we adopt this categorization in our research to further study the effect of coping strategies. In particular, based on Mick and Fournier's research (1998), avoidance coping strategies include refuse, ignore, and delay. Confrontational strategies include extended decision-making and pretest. Please refer to the table 2 for the exact definition of these strategies.

Table 2. Definition of Detailed Coping Strategies

Coping tendencies	Definition
Avoidance strategies	
Ignore	Avoiding information about the characteristics or availability of certain technological products
Refuse	Declining the opportunity to own a specific innovation
Delay	Keeping using the existing product until it is broken, or far out of date
Confrontation strategies	
Pretest	Asking for a trial of an innovation product
Extended Decision Making	Taking stock of one's needs, searching diligently for detailed innovation information, and then purchasing the most appropriate alternative in a careful manner

3.2.2 The role of coping strategies

Recent research has suggested that consumers often use existing knowledge to learn about innovative products or services (Yamauchi and Markman, 2000; Gregan-Paxton and Roedder John, 1997). Hence, when evaluating a new product or service, consumers often try to form an evaluation of it by using existing nodes of knowledge from multiple product or service categories. Analogical learning theory suggests that consumers facing with something unfamiliar would use familiar knowledge to understand and comprehend the new phenomenon (Roehm and Sternthal, 2001; Gregan-Paxton and Roedder John, 1997). More specifically, consumers use information from a familiar domain (a base) and transfer it to the novel domain (the target).

However, previous research has omitted a precondition of the above learning stage, which is the consumers' willingness to learn or not. Learning stage should be based on whether consumers are willing or not to learn the innovative products, since consumers who feel that the new product or service is not in tact with their past experiences, lifestyle, values, and needs are likely to reject the product or service before it enters their consideration sets. Rogers (1995) states that individuals avoid messages that are conceived to be in conflict with existing needs, beliefs, and attitudes; consumers do not "see" the innovation even if they are exposed to it. In other words, he/she will adopt confrontational strategies or avoidance strategies to decide whether he/she will learn or not.

Mick and Fournier's (1998) theory of technology adoption is the most pertinent to this study as it focuses on consumers' behaviors and attitudes once they have adopted a technology. They have explored the paradoxes of technological products and their influences on emotional reactions and behavioral coping strategies.

They suggest in the discussion that future studies can explore how coping strategies affect consumer decision making in innovation adoption. As a mechanism for dealing with stressful situations, such as the emergence of new technologies, we argue that coping strategies accumulated from previous experiences serve as a predisposition when consumers receive information or solicitation about a new product. Thus, coping strategies may affect consumers' information processing, i.e., their perceptions of the new products, which in turn influence their purchase decisions. This proposition is consistent with Duhachek's research (2005). In his Multidimensional Model of Consumer Coping, he suggests that consumers' consumption situation may cause emotional changes to consumers, such as threat, anger, sadness, and challenge. Consumers adjust various coping strategies to handle these negative emotions, and the consequence of this coping process is consumer may change their cognitive perceptions on products. However, in his research, he has not found empirical evidence of how coping strategies would affect consumers' perceptions on products. Thus, this relationship is elaborated and tested in current research.

Nowadays innovation products are revolutionized at an impressive speed. New versions of product are introduced to enhance company's competitiveness even before its previous generation saturates the market. As we discussed earlier, coping strategy is rather a habit or a behavior pattern than a specific strategy. Habit is defined as a stable personal factor that affects the decision making process on a recurrence basis (Aarts et al. 1997). Once habits toward a particular behavior are formed, individuals will engage in minimal information processing each time they encounter comparable situations. While it is impossible for consumers to pay close attention to every new product, it is a natural response for consumers to adopt their

own and unique coping strategies to deal with the new products.

Rogers (1995) suggests that prior practice with an innovation is essential in building how-to knowledge and enhancing observability and trialability of an innovation, which are important in the knowledge and early persuasion stage. As a result or the reflection of prior experiences with innovation products, consumers' coping strategies play an important role in their knowledge and early persuasion stage. In these two stages, consumers mainly form favorable or unfavorable perceptions towards an innovation product. Thus, consumers' perceptions are influenced by their coping strategies.

Evidence of effect of habit or previous strategies on people's perceptions can be found in various literatures. Erdem's (1996) empirical result suggests that a large proportion of consumers are habit persistent. Kessler (2003) discusses that representatives can be more successful in gaining both mental and physical access to their physician customers by understanding physician's clinical behavior and prescribing habit to change physician's perception of representatives' behavior. Jacoby et al. (1978) found that one important implication of low rates of pre-purchase acquisition of information from the environment is that consumers, if they do in fact use information, rely on their own subjective sources (i.e. memory). In line with Haines' (1974) principle of information-processing parsimony, "...consumers seek to process as little data as is necessary in order to make rational decisions".

In France and Bone's (2005) research, they suggest that consumer process information through different "filters" may bias consumer beliefs about the product, which is called biasing filter. We theorize that the role of coping strategy serve as one of the biasing filters that affect a consumer's willingness to accept the message, the message's believability, the relevance of the message to the consumer, and the

consumer's predisposition to believe or reject the message, which in turn form their "biased" beliefs about the product (whether it is useful, easy to use, etc).

3.2.3 Comparison of coping strategy and innovativeness

Past research has conceptualized consumer innovativeness in two primary ways (Im et al., 2003). On one hand, consumer innovativeness is defined as actualized or domain-specific according to identifiable characteristics and actual acquisitions of new information, ideas, and products (Hirschman, 1980a; Midgley and Dowling, 1978). In a marketing context, the construct has been measured by purchase intentions and opinions on certain new products, the number of new products owned, and the relative time of adoption for a particular new product, and is usually applied to domain-specific products and services. On the other hand, consumer innovators are identified by virtue of their unobservable "innovative predisposition" across product classes (Midgley and Dowling, 1993), which is often referred to as innate or general innovativeness (Hirschman, 1980a). From this perspective, innovativeness is considered a generalized personality trait (Goldsmith and Hofacker, 1991; Goldsmith et al., 1995). In the marketing literature, this conceptualization represents a highly abstract and generalized personality trait (Im et al., 2003). Other similar measures include "a willingness to change" (Hurt et al., 1977) and the receptivity to new experiences and novel stimuli (Goldsmith, 1984; Leavitt and Walton, 1975).

In comparison to domain-specific innovativeness, generalized innovativeness is found not as predictive, and less of an individual personality characteristic. Gatignon and Robertson (1985) found little overlap in innovativeness across domains or product categories suggesting that innovation is fairly product or domain specific. Moreover, domain-specific measures of innovativeness can yield more useful

predictions as far as the adoption of innovations by consumers is concerned (Goldsmith and Hofacker, 1991; Hirschman, 1980b).

However, it is argued here that domain-specific innovativeness is not as predictable as consumer's coping strategy. Domain specific innovativeness, as its name suggests, it only reflects the tendency to learn about and adopt innovations within a specific domain of interest. Consumers' coping strategies are formed from previous experiences of various innovation products. They are not necessarily "domain specific". In contrary, a consumer's coping strategy will be more consistent as his/her experiences increase. Therefore, coping strategy has more generalizability in predicting consumers' acceptance of technological innovations than domain specific innovativeness.

Although both coping strategy and innovativeness are considered generalized personality trait, coping strategy can measure more than one dimension. It is not limited to the scope of either willingness to change or not, rather it examines how consumers cope with the changes.

3.3 Hypotheses

Our research examines how coping strategies affect the consumer's attitude and behavior towards an innovation. The model recognizes the complexity of every consumer's past experiences with innovation products and their predisposition formed over time. Figure 3 shows the model proposed in this study. The theoretical rationale for each path is given below. This model is mainly consisted of two parts: one is framed in the solid lines, which is the traditional TAM model; the other one is framed in the dashed lines, and it is the focus of our research. Based on the TAM and our discussion on the role of coping strategies, we propose the following hypotheses.

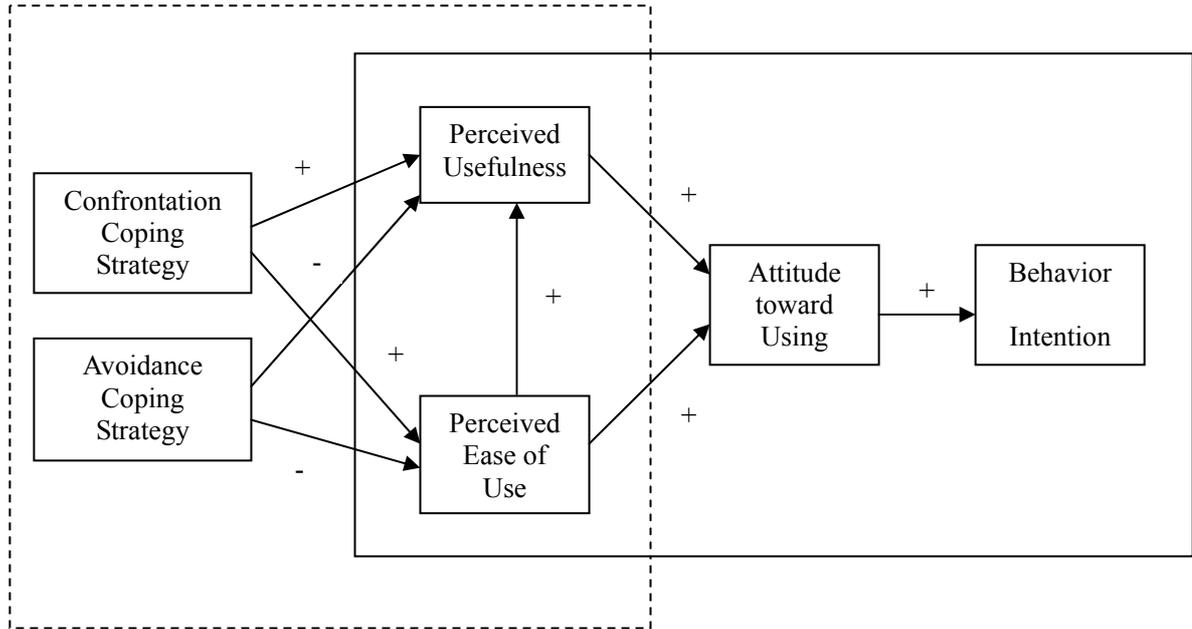


Figure 3. Theoretical Model

Perceived usefulness in the TAM model refers to job related productivity, performance and effectiveness (Davis, 1989). Davis et al, (1989) has found that in the workplace context, perceived usefulness and ease of use are two primary drivers of attitude towards behavior intention. Later, studies verified these relationships in the consumer context, as well as in the adoption of m-commerce (Bruner and Kumar 2005) and various setting under m-commerce such as wireless finance (Kleijnen et al, 2003) and various setting under m-commerce such as wireless finance (Kleijnen et al, 2003) and 3G mobile multimedia services (Pagani, 2004). As Chen and Nath (2003) point out in their study, the value of m-commerce is a function of the time sensitivity of the information or transaction, and the mobility of the information user. For example, M-ticketing in Hong Kong allows consumers to buy a movie ticket through a mobile phone, so consumers can save time to do other things. It provides flexibility to consumers. If a consumer perceives technology based innovation as more useful; he or she is more likely to adopt it.

Hypothesis 1: Perceived usefulness of an innovative product has a positive effect on

consumer's attitude towards using it.

Perceived ease of use is another major determinant of attitude toward use in the TAM model. This internal belief ties to an individual's assessment of the mental effort involved in using a system (Davis, 1989). If a technology requires less effort to use, it may be more widely used because it is pleasant to interact with and results in less frustration. Quite a few empirical studies confirmed the effect of ease of use on attitude toward use (e.g. Al-Gahtani and King, 1999; Lu and Gustafsen, 1994; Moore and Benbasat, 1991). Even though Chau (1996) excluded the original construct of perceived ease of use in his modified TAM model, he also admitted that in the exploratory state of technology use, ease of use played an important role.

Hypothesis 2: Perceived ease of use of an innovative product has a positive impact on attitude towards using it.

Meanwhile, previous researches (Kleijnen, 2004, Bruner and Kumar, 2005) find that while perceived ease of use may have a direct positive effect on the attitude toward mobile services, it also has a positive effect on the perceived usefulness. They demonstrate that perceived usefulness and perceived ease of use are distinct but related constructs. Improvements in perceived ease of use may contribute to improved performance. Consumers are likely to perceive new products to be more useful, if consumers believe these products are easier to use, since they can spend more time using it rather than figuring out how to use it.

Hypothesis 3: Perceived ease of use of an innovative product has a positive impact on consumer's perceived usefulness.

Attitude has long been identified as a cause of intention. Psychologists have discussed the theoretical construct of attitude for decades. Attitude in the Fishbein and Ajzen's (1975) paradigm is classified into two constructs: attitude toward the

object and attitude toward behavior. This evaluation of a specified behavior leads to certain behavioral intention that further results in certain behavioral action. Adapting this general principle, attitude toward use in the TAM model is defined as the mediating affective response between usefulness and ease of use beliefs and intentions to use a target system. In other words, a prospective user's overall attitude toward using a given system is an antecedent to intention to adopt (Davis, 1989). In consumer research, attitude is the construct that receives most attention and is used most widely for predicting consumers' likelihood to adopt a new technology-based product (Erevelles, 1998). Consumers today have been exposed to many technology innovations. They are likely to have formed favorable or unfavorable attitude about them irrespective of whether they have actually used the product in question. Therefore, we postulate the following proposition:

Hypothesis 4: The attitude towards a new product has a positive effect on behavioral intention.

Technology innovation products can be very complex and difficult to use. Some new features of these innovations are useful and bring conveniences to consumers, but more than often, they also require a lot of consumer learning to use them. As we discussed earlier, use of technology innovations may bring stress and paradoxes to consumers. When consumers see and feel these side effects of innovations, they may form their own coping strategies to handle future innovations. Existing studies related to TAM suggest that perceived usefulness and ease of use are two major factors influencing the consumers' adoption decision. Following passages discuss how coping strategies can influence consumers' perceived usefulness and ease of use of technology innovations.

A screening or filtering process occurs before customers begin to evaluate

innovations (Bolfing, 1988). Coping strategies serve as a perceptual filter for consumers. Consumers may approach and process the information of a new product using the filter of “confrontation coping strategy”, or they may be inhibited by the filter of “avoidance coping strategy”.

Consumers with confrontation coping strategies tend to be positive and optimistic. They have enjoyable past experiences with innovation products. These beneficial experiences help people form positive perceptions and more interest in innovation products. They are willing to accept marketing messages, and see the positive features of the new product. Salient beneficial features of a new product passing through the confrontation coping strategies filter of the consumer, has a more favorable effect on judgments of a product (Ratneshwar, 1997). In addition, since confrontation coping strategies can help them reduce the uncertainty and risk of innovations, they actively involve in the learning process and will perceive innovations easier to use. Thus, consumers with confrontation coping strategies are more likely to perceive innovations more useful and easy to ease.

Consumers with avoidance coping strategies tend to be negative and pessimistic. They do not welcome innovations and any changes brought to their lives. There are two possibilities for them. The first possibility is that the filter of avoidance coping strategy inhibits the incoming of information of an innovation. Consumers cannot see “it”, even if they are exposed to it. In this case, consumers’ previous negative experiences of innovations dominate their perception of any innovation product, which in turn extends to the perceptions of new products. Therefore, they are likely to perceive an innovation product less useful and not easy to use. The second possibility is that consumers with avoidance coping strategies may selectively pay attention to some information that is consistent with their

personalities and beliefs. Consumers' cognitive readiness determines which aspects of products are perceived (Higgins, 1990). Consumers with avoidance coping strategies are not ready to perceive positive aspects of the innovations. They may consider new technologies too demanding and complicated, thus difficult to use. Take new medicine for example, consumers with confrontation coping strategies may pay attention to the functions of the medicine, while consumers with avoidance coping strategies may pay attention to the side effects of the medicine. The selective attention of consumers with avoidance coping strategies lead to the result that they are more likely to perceive an innovation product less useful and not easy to use.

Overall, a coping strategy as a predisposition will affect consumers' desire to learn about an innovation product and their cognitive processes, which in turn will affect their perceptions of innovations. People who are used to confrontation coping strategies are more likely to perceive innovations more useful and easier to use, whereas people who are accustomed to avoidance coping strategies tend to consider innovations less useful, and difficult to use. Thus, we propose the following hypotheses:

Hypothesis 5a: Confrontation coping strategies has a positive effect on consumer's perceived usefulness of innovation products.

Hypothesis 5b: Avoidance coping strategies has a negative effect on consumer's perceived usefulness of innovation products.

Hypothesis 6a: Confrontation coping strategies has a positive effect on consumer's perceived ease of use of innovation products.

Hypothesis 6b: Avoidance coping strategies has a negative effect on consumer's perceived ease of use of innovation products.

CHAPTER 4. RESEARCH METHODOLOGY

In this exploratory study, a Central Location Intercept Survey design was used to test the hypothesized model. As Structural Equation Modeling was proposed to test the conceptual model, I planned to collect at least 200 questionnaires to meet the requirement of SEM. In total, 300 people were randomly selected in some places of Hong Kong to answer the questionnaire, which resulted in 262 valid questionnaires for data analysis. Since survey research utilizes standardized questionnaires that may cause the researcher to miss what is most important to a respondent. To limit this concern, the measurement of coping strategies was designed based on Mick and Fournier's (1998) qualitative depth interview, and a pilot study was conducted in order to ensure its reliability and validity. In the pilot study, a convenience sampling of 40 undergraduate students in Lingnan University were selected to answer the survey. However, since only three items were designed to measure each coping strategy, the results showed low reliability of the measures of coping strategies. The failure of the pilot study leads to a redesign of measurement of coping strategies. In the finalized version of the survey, each coping strategy has four to five measures to ensure its reliability. Operationalization of other variables in the model is also discussed in this chapter.

The purpose of this chapter is to detail the techniques used for collecting the data, which was used ultimately for testing the hypotheses related to proposed model in Chapter 3. This chapter also includes the statistical methods that were used to test these hypotheses.

4.1 Data collection

Communications and services through wireless telecommunication networks that interface with mobile services are becoming increasingly popular on a global scale. Abundant information has indicated that the proliferation of wireless Internet via mobile devices is creating unparalleled opportunities for e-commerce to leverage the benefits of mobility. It allows consumers and business to build connectivity by transcending time and place, increasing accessibility, and expanding their social and business networks (Palen, 2002). This proliferation will provide the ubiquity, convenience, localization, and personalization for users participating in mobile communications and service activities (Clarke, 2001). Thus, at this early stage of mobile commerce development and implementation, research on its acceptance will be extremely worthy in providing useful information.

The data of this study come from 3G-phone market in Hong Kong. Since the 3G market in Hong Kong has been launched for just about two years, only a few consumers adopt the 3G service. The adoption rate is very low (about 6%) even though mobile network operators have made great efforts on promoting the brand-new technology. In addition, because Hong Kong people possess an existing familiarity with 3G phone which would avoid compounding any effects that may results from our introduction of 3G phone to the respondents. Third reason is the relatively higher broadband penetration rate (55%) in Hong Kong and variety of contents provided by 3G service providers. Moreover, convenience of data collection is another consideration.

The data will be collected by means of Central Location Intercept Survey (CLIS). The survey questionnaire contains a variety of questions pertaining to current and potential use of 3G service. It also includes questions about respondent

demographics. In order to minimize the sample bias, we chose different areas of Hong Kong to conduct survey. The reason why we do not use homogenous sample is that we would like to explore whether demographics such as age, education, income, job nature would affect consumers' coping strategies. The places include urban areas (Central, Wan Chai, Tsim Sha Tsui, Causeway Bay, Mong Kok, Kowloon Tong, Hong Hom, Admiralty, Prince Edward), new towns (Tuen Mun, Tsuen Wan, Yuen Long, Sha Tin, North Point), as well as some universities (Lingnan University, University of Hong Kong, Chinese University of Hong Kong, Hong Kong University of Science and Technology). We set up a booth in each place mentioned above and asked passer-by to fill in the questionnaire. Upon the completion of survey, one recycling bag was given to each respondent as a souvenir carrying our appreciation. One question in the survey asking "do you currently own a 3G phone?" is used to determine whether the respondent is a non-adopter or an adopter. The responses resulted in 262 valid questionnaires. Among 262 respondents, there are totally 216 respondents who have not adopted 3G phones yet, and 48 respondents who have been adopters of 3G phone and some 3G services.

4.2 Operationalization and measures

The following subsections describe the way the constructs in the research model are operationalized. Table 3 shows the questions need to measure coping strategies and other constructs' measurements.

Operationalization of coping strategies is developed based on Mick and Fournier's (1998) research. In their research, they interviewed people about their coping strategies used to deal with paradoxes of technological based innovations. A set of potential items was generated based on interview responses of Fournier's (1998) research and the definition of each coping strategies. After evaluation by

several judges on face validity, the scale was pretested on a convenience sample of 40 undergraduates in Lingnan University. Three items were designed for each aspect of coping strategies on a 7-point Likert-type scale anchored by “strongly disagree” and “completely agree”. The reliability coefficient alphas indicate a fair convergence of each aspect. So, the measurement then was redesigned to be more general and consistent. Detailed questions after revising are listed in table 3.

Operationalization of other constructs, perceived usefulness, perceived ease of use, fun, perceived cost, perceived quality, attitudes towards using and behavioral intention, were partly derived from instruments of prior literature and adjusted to 3G phone context, which is also listed in the table 3. The items were developed in a fashion that would allow them to be asked of people who had not yet tried to use any of the 3G phones. All of these constructs used multi-item scales to allow the respondents to indicate the extent to which they agree or disagree with statements related to each construct. All construct measurement scales are 7 points Likert scale from 1 (very strongly disagree) to 7 (very strongly agree).

4.3 Analysis

First, descriptive statistics were used to examine demographic profiles of respondents. Second, exploratory factor analysis was used to identify the underlying factors of respondents’ coping strategies of innovation products since these constructs were measured with multiple items. Third, confirmatory factor analysis using AMOS was adopted to examine the validity of coping strategy’s measures. Fourth, structural equation modeling was used to estimate the proposed model. Finally, T-TEST and Crosstabs were conducted to profile respondents.

CHAPTER 5. RESULTS

5.1 Descriptive analysis

Appendix A summarizes the basic demographic information from the 216 respondents. As indicated in the table, more women responded to the survey than men did (54.9% and 45.1%). Age ranges from 11 to 61. 59.2% of the respondents are younger than 25. 38.8% of the sample is between the ages of 25 and 50. Only 1.5% of the respondents are older than 50. The most common educational category includes respondents with university degree (38%). Income figures are distributed normally except for a large group with incomer lower than \$5,000 (39.4%). Respondents are spread across various industries and come from different social and economic status. Thus, the sample represents people from different demographic groups of Hong Kong.

5.2 Measures' reliability

Cronbach's alpha is used to measure the internal consistency of the instruments. The Cronbach alpha scores for each measure are shown in Table 3. Each of the scales used to measure the variables in TAM model originated from previous research. Alpha coefficients for usefulness, ease of use, attitude and behavioral intention range from 0.79 to 0.88.

One of the purposes of this research was to develop a reliable and meaningful instrument for coping strategy. Thus, this part will be discussed into details. Scale purification began with the computation of coefficient alpha (Cronbach 1951). Because of the multidimensionality of coping strategy, coefficient alpha was

computed separately for the five dimensions to ascertain the extent to which items making up each dimension shared a common score. Items are discarded when SPSS' results of "scale if item deleted" are high. This sequence resulted in a set of 23 items, with alpha ranging from 0.71 to 0.78 across the five dimensions. All the reliability measures satisfy the generally accepted threshold of 0.7 for reliability, which suggested a high internal consistency among items within each dimension.

Table 3. Measures and Reliability

Construct	The Source of Measures/Items	Alpha
Refuse	<ol style="list-style-type: none"> 1. I am accustomed to avoiding information about the characteristics or availability of any innovations. 2. I tend to show indifference towards any information about any innovations. 3. I am used to declining the opportunity to own a new product. 4. I always refuse other people's persuasion to buy any new product. 	0.76
Ignore	<ol style="list-style-type: none"> 1. I am accustomed to ignore the existence of an innovation. 2. I always have no interest in getting to know any new product. 3. I am always not concerned of information of any new product. 4. I do not even take a quick look at the information about new products or service, even if I have a lot of information at hand. 	0.77
delay	<ol style="list-style-type: none"> 1. I will not buy the innovation products until my own product is exhausted. 2. I will not buy innovation products until my own was out of date. 3. I tend to delay the adoption of new products to avoid the phenomenon that innovation products mostly get out of date soon. 4. I am accustomed to delay adoption of innovation products until more sophisticated product appears. 5. Most of new products have flaws or not mature enough, thus I tend to delay the adoption. 	0.78
Pretest	<ol style="list-style-type: none"> 1. It is much easier for me to make an adoption decision when a trial is offered in the shop. 2. I check all the functions of a new product in the duration of the return period. 3. Facing a new product, I tend to ask for a trial all the time. 4. I can make an adoption decision more easily if the new product can be returned to shop freely during a certain period. 5. In the exhibition of an innovation product, I would like to see somebody demonstrate its functions. 	0.71
Extended Decision Making	<ol style="list-style-type: none"> 1. I tend to search diligently for detailed new product. 2. I tend to take stock of my needs, and actively ask for my friends or experts' suggestions finally buy the right one. 3. I tend to purchase a product in a careful, calculating manner. 4. I will not make the adoption decision of a new product until I am familiarized with it. 5. In face of new products, I always compare all the alternative brands and buy the most suitable one. 	0.73
Usefulness	<ol style="list-style-type: none"> 1. I find 3G phone useful in my life. 2. 3G services provide my more control over my daily lives. 3. 3G phone is functional. 	0.8665
Ease of Use	<ol style="list-style-type: none"> 1. I find 3G phone easy to use. 2. I find 3G phone easy to learn. 3. 3G phone is convenient. 	0.7912
Attitude	<ol style="list-style-type: none"> 1. In general, I have a positive opinion about 3G phone. 2. For me, adopting a 3G service is a good idea. 3. For me, using a 3G service is a wise idea. 	0.8672
Behavioral Intention	<ol style="list-style-type: none"> 1. Given the chance, I predict that I should buy a 3G phone in six months. 2. Given the chance, I predict that I should adopt any 3G service in the future. 	0.8824

5.3 Constructs' validity

Principle Axis Factoring Analysis with varimax rotation method was conducted. Eigenvalue greater than one was chosen to be the extraction criteria. Five factors were extracted as expected and when rotated orthogonally, a clear factor pattern emerged. The factor-loading matrix was by and large easy to interpret and consistent with our categorization of coping strategies. Forty-three percent of cumulative variance was explained by these five factors. Rotated Factor Matrix is shown in Table 4. Each one of six variables is separately loaded on each one of five factors as expected. From the data itself, EDM7 and EDM 6 have high loadings on pretest, but according to the survey questions, EDM7 and EDM6 belong to extended decision making, and deletion of EDM7 and EDM6 lowers the reliability of EDM and pretest.

Separate confirmatory factor analyses were performed by specifying the posited relationships of the observed variables to the underlying three dimensions of avoidance coping strategies and two dimensions of confrontation coping strategies, with the dimensions allowed to intercorrelate freely. The original data were used as the input data for the confirmatory factor analysis procedure in AMOS. As shown in Figure 4, each of five observed variables loads onto the extended decision making and pretest. In Figure 5, five observed variables load onto delay, and four variables load on ignore and refuse. In addition, errors of measurement associated with each observed variable are uncorrelated.

Table 4. Rotated Factor Matrix

	Factor				
	1	2	3	4	5
REFUSE2	.549	.302	.035	.032	.111
REFUSE3	.577	.191	.093	-.001	-.115
REFUSE4	.539	.361	.252	-.072	.017
REFUSE5	.705	.130	.191	-.072	-.076
IGNORE1	.153	.541	.285	.036	-.003
IGNORE2	.208	.599	.173	-.159	.218
IGNORE3	.215	.744	.131	-.077	.009
IGNORE4	.260	.591	-.008	-.056	.052
D1	-.025	.077	.648	.052	.079
D2	.141	.231	.554	-.002	.112
D3	.183	.122	.598	.037	.099
D4	.236	.063	.597	.043	.154
D5	.059	.091	.688	.170	-.002
EDM2	-.024	-.130	-.025	.689	.175
EDM4	-.048	-.026	.298	.469	.249
EDM6	.050	-.098	.109	.368	.423
EDM7	.090	-.116	.364	.165	.537
EDM8	-.042	-.071	.306	.391	.366
PRETEST4	.022	.112	.078	-.075	.662
PRETEST5	.045	-.087	.057	.132	.627
PRETEST6	-.030	.204	-.034	.100	.539
PRETEST7	-.123	.090	.043	.181	.402
PRETEST8	-.119	.177	.216	.324	.495

Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 14 iterations.

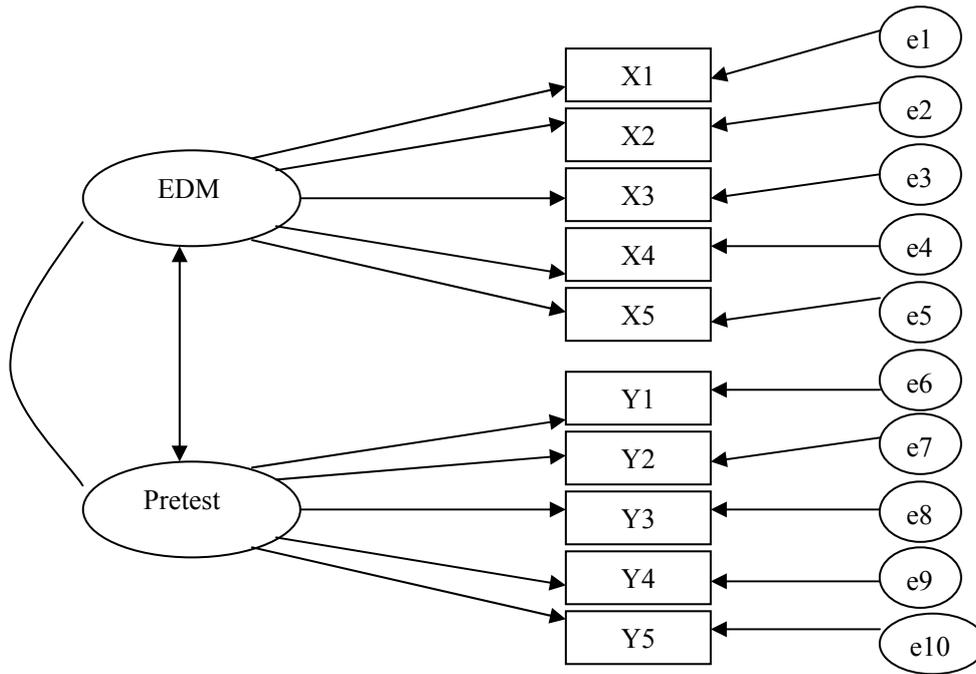


Figure 4. CFA of confrontation strategies

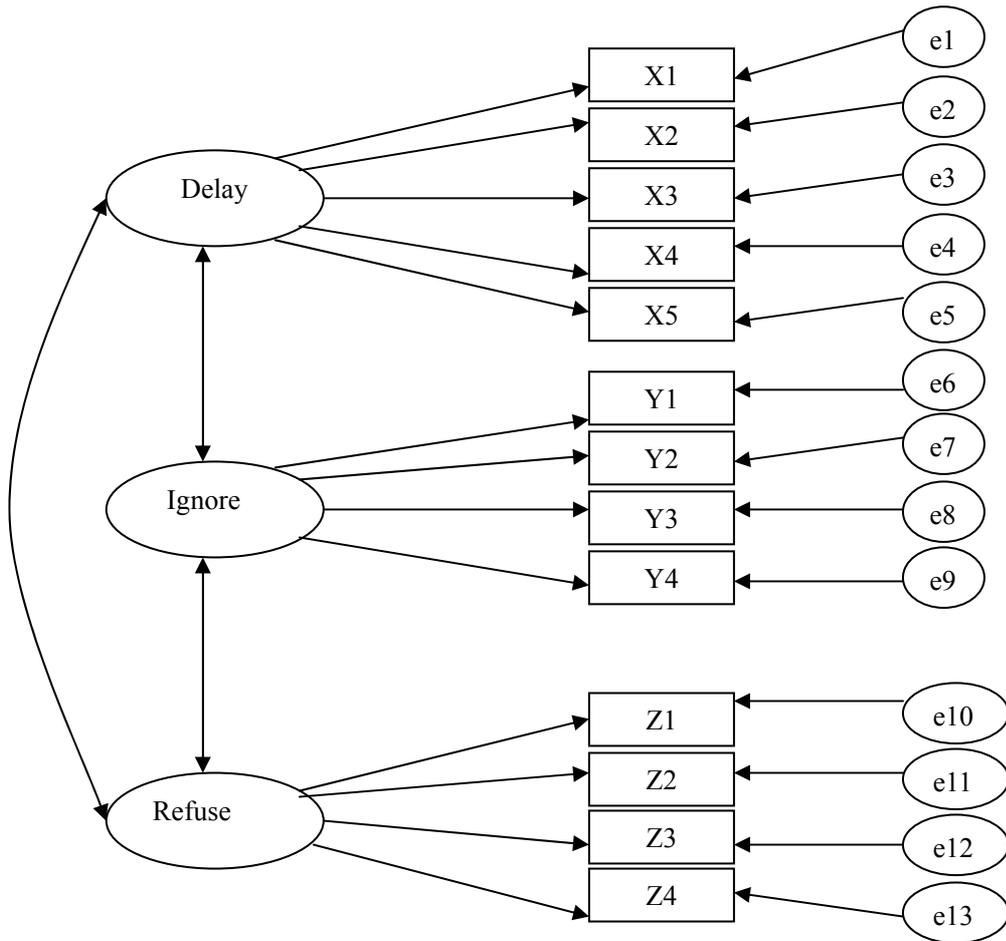


Figure 5. CFA of avoidance strategies

As it is the first time to develop measures for coping strategies, confirmatory factor analysis using Amos with maximum likelihood estimation was used to test the fit of the factorial structure model of coping strategies. Assessment of model adequacy in this study is provided by two statistics: (a) the chi-square to degrees of freedom ratio, and (b) goodness of fit indices. CFA is useful to examine the conceptual validity of a theoretical construct through analyzing the correlation and covariance matrices. CFA is executed separately on Avoidance (refuse, ignore, delay) and Confrontation (extended decision making, pretest) coping strategies. The results of confirmatory factor analysis of coping strategies are summarized in Tables 5a and 5b. The findings indicate that all the factor loadings are healthy and significant, ranging from 0.508 to 0.808. The avoidance model fits well with a chi-square/degrees of freedom ratio of 1.906, $p=0.000$, a Comparative Fit Index (CFI) of 0.929, Goodness of Fit Index (GFI) of 0.918, Normed Fit Index (NFI) of 0.864, Adjusted Goodness of Fit Index (AGFI) of 0.880, and the Root Mean Square Error of Approximation (RMSEA value) at 0.066. The confrontation model fits not as good as avoidance model with a chi-square/degrees of freedom ratio of 2.921, $p=0.000$, a CFI of 0.859, a NFI of 0.805, a GFI of 0.917, a AGFI of 0.866 and the RMSEA value at 0.096. Overall, GFI of both models are higher than 0.90. All the selected index values indicated an acceptable model fit, meeting the recommended criterion of 0.9 or above. These inferential statistics furnish evidence for the construct validity of coping strategy.

Table 5a. Confirmatory Factor Analysis of Avoidance Coping Strategy

Factors and Indicators		Factor Loading
Factor 1 Refuse	Refuse 1	0.605
	Refuse 2	0.591
	Refuse 3	0.738
	Refuse 4	0.688
Factor 2 Ignore	Ignore 1	0.603
	Ignore 2	0.696
	Ignore 3	0.808
	Ignore 4	0.620
Factor 3 Delay	Delay 1	0.579
	Delay 2	0.626
	Delay 3	0.700
	Delay 4	0.677
	Delay5	0.657

Notes: Overall fits of measurement model: $X^2/df=118.183/62=1.906$;
GFI=0.918; AGFI=0.880; CFI=0.929; RMSEA=0.066

Table 5b. Confirmatory Factor Analysis of Confrontation Coping Strategy

Factor and Indicators		Factor loading
Factor 1 EDM	Edm 1	0.508
	Edm 2	0.583
	Edm 3	0.587
	Edm 4	0.624
	Edm 5	0.620
Factor 2 Pretest	Pretest 1	0.555
	Pretest 2	0.590
	Pretest 3	0.565
	Pretest 4	0.525
	Pretest 5	0.661

Notes: Overall fits of measurement model: $X^2/df=99.317/34=2.921$;
GFI=0.917; AGFI=0.866; CFI=0.859; RMSEA=0.096

5.4 Structural equation modeling

5.4.1 Specification of the SEM

Over the last two decades, the use of structural equation modeling has become increasingly popular in behavioral science. One reason for this is that confirmatory method provides studies with a comprehensive means for assessing and modifying theoretical models (Anderson and Gerbing, 1988). Since most theories in behavioral science are formulated in terms of hypothetical latent constructs, which are theoretical creations that cannot be observed or measured directly, studies need to define the hypothetical constructs by specifying the dimensions of each construct. Therefore, the measurement of the hypothetical construct is done indirectly through one or more observable indicators, such as responses to questionnaire items that are assumed to represent the construct adequately. Once theoretical constructs are defined by observable indicators, the theory further defines how the constructs are interrelated by hypotheses. This includes the classification of the constructs into dependent (endogenous) and independent (exogenous) constructs. The relationship between observable indicators and the theoretical constructs constitutes the measurement part of the model, and the theoretical relationships between the constructs constitute the structural part of the model (Joröskog, 1993).

Structural equation modeling is a multivariate statistical technique that takes a confirmatory approach to the multivariate analysis of a structural theory. The most obvious difference between structural equation modeling and other techniques is the use of separate relationships for each of a set of latent variables. Structural equation modeling estimates a series of separate, but interdependent, multiple regression equations simultaneously by specifying the structural (causal) relationships proposed on the hypothesized structural model. The structural model defines the relations

among the unobserved factors (latent constructs) and is typically identified in schematic diagrams by the presence of interrelated ellipses in Amos' Graphics, each of which represents a hypothetical construct (or factor). First, in this hypothesized structural model, the relationships among the constructs (latent variables, factors) are specified. Then, the hypothesized structural model is tested statistically in a simultaneous analysis of the entire system of variables to determine the extent to which it is consistent with the data. With SEM, we can specify and test any hypothesized conceptual construct comprising a set of variables, while controlling for errors of measurement and other irrelevant sources of variance.

The primary purpose of this study is to examine the effects of a consumer's coping strategy on his/her perceptions of an innovative product. More specifically, the objective is to investigate: (1) the influence of confrontation and avoidance coping strategies on perceived usefulness and ease of use; (2) comparisons of alternative models: the effects of confrontation and avoidance coping strategies on attitude and behavioral intention. Previous chapters have described and explained the logic behind the basic theoretical model and hypotheses in the current study.

Structural Equation Modeling (SEM) procedures are then followed to test the proposed model on the correlation matrix shown in Table 6. Amos version 5 was used as the model-fitting program. As hypotheses 5 and 6 have proposed, we would like to test the effects of confrontation and avoidance coping strategies on the usefulness and perceived ease of use. According to the typology of coping strategies we discussed earlier, avoidance coping strategies have three dimensions: ignore, delay, refuse, and confrontation coping strategies have two dimensions: extended decision making and pretest. The correlation between confrontation coping strategy and avoidance coping strategy is 0.099, which is not significant. Discriminant

validity is established.

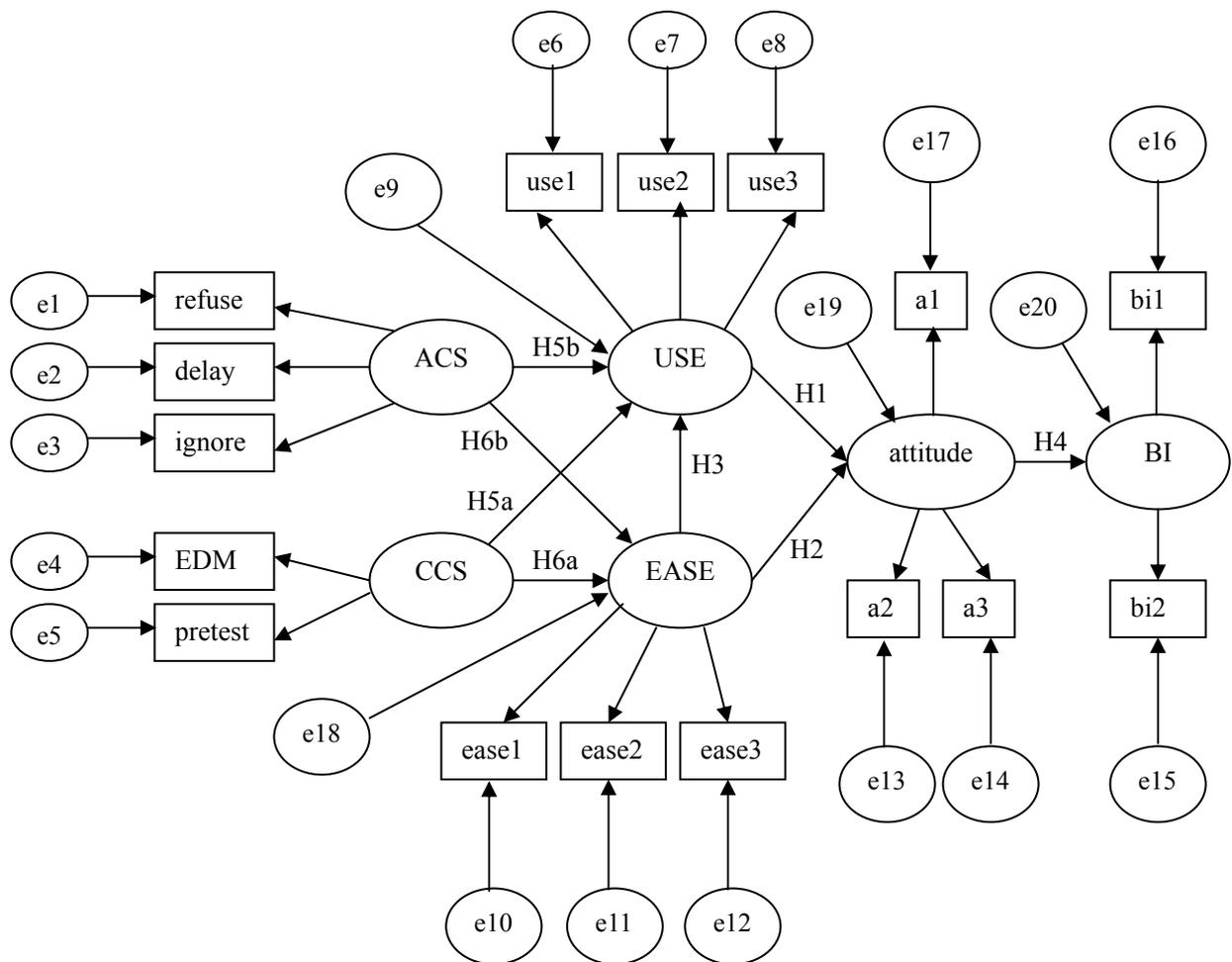
Table 6. Correlation Matrix for SEM

	mean	Std deviation	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15
X1	3.853	1.019															
X2	3.995	1.047	0.50**														
X3	4.595	0.903	0.34**	0.33**													
X4	4.959	0.808	-0.03	-0.03	0.36**												
X5	4.580	0.903	0.01	0.16*	0.22**	0.50**											
X6	4.31	1.356	-0.15*	-0.05	-0.04	0.13*	0.16**										
X7	4.00	1.413	-0.10	-0.06	0.05	0.12*	0.21**	0.79**									
X8	3.73	1.532	-0.15*	-0.02	-0.10	0.05	0.21**	0.60**	0.67**								
X9	4.26	1.309	-0.12*	-0.16*	-0.09	0.20**	0.23**	0.55**	0.50**	0.50**							
X10	4.31	1.325	-0.24**	-0.21**	-0.17*	0.12*	0.14*	0.50**	0.45**	0.40**	0.60**						
X11	4.17	1.285	-0.02	-0.05	0.01	0.16*	0.24**	0.61**	0.57**	0.55**	0.56**	0.51**					
X12	4.09	1.401	-0.11	0.06	0.06	0.18**	0.28**	0.44**	0.46**	0.32**	0.31**	0.21**	0.39**				
X13	3.80	1.454	-0.03	0.04	-0.04	0.07	0.23**	0.39**	0.45**	0.33**	0.34**	0.28**	0.38**	0.72**			
X14	3.59	1.326	-0.05	0.03	-0.07	-0.01	0.12	0.34**	0.39**	0.26**	0.30**	0.26**	0.27**	0.60**	0.73**		
X15	3.25	1.641	-0.06	0.08	-0.07	0.03	0.16*	0.37**	0.30**	0.29**	0.37**	0.29**	0.34**	0.58**	0.67**	0.57**	
X16	3.58	1.524	-0.11	0.04	-0.10	0.06	0.20**	0.38**	0.34**	0.35**	0.38**	0.31**	0.35**	0.60**	0.71**	0.66**	0.79**

Note: *: sig. <=0.05, **: sig. <=0.01. X1: refuse; X2: ignore; X3: delay; X4: EDM; X5: pretest; X6: USE1; X7: USE2; X8: USE4; X9: EASE1; X10: EASE2; X11: EASE6; X12:ATTi1; X13: ATTi2; X14: ATTi3; X15: BI1; X16:BI2.

Figure 6 presents the structural model tested in this study. The model proposes that consumers' perceived usefulness and ease of use are influenced by confrontation and avoidance coping strategies. The reason why we test these two main coping strategies instead of detailed five coping strategies is that our focus is on a theoretical model concerning the relationship of coping strategies and consumers' perceptions, which we had discussed earlier. In addition, five coping strategies would lead to a very complex model and establish identification problems. The model also suggests that consumers' perceived usefulness and ease of use influence their attitudes, which in turn affect their behavioral intentions. The details of each construct were discussed and the reliability and validity of measurement scales were confirmed earlier. In this section, the proposed structural model is tested with SEM.

As shown in Figure 6, the model has six constructs (latent variables). Two of these latent variables (ACS and CCS) are the independent latent variables and the other four are latent variables (USE, EASE, attitude, and BI). The independent latent variables are the avoidance coping strategy and confrontation coping strategy. The measurement model of avoidance coping strategy and confrontation coping strategy comprises three and two observed indicator variables (refuse, ignore, delay; EDM, pretest) respectively along with their measurement error terms. The dependent variables comprise of 11 observed indicator variables (use1, use2, use3, ease1, ease2, ease3, a1, a2, a3, bi1, bi2), accompanied by their associated error terms.



Note: EDM: extended decision making; ACS: avoidance coping strategy; CCS: confrontation coping strategy; USE: perceived usefulness; EASE: perceived ease of use; BI: behavioral intention

Figure 6. Structural Equation Modeling in AMOS

5.4.2 Identification of SEM

There are three situations concerning with model's identification: underidentified, just identified, and overidentified. Underidentification happens when there are fewer "known" than "unknown" parameters. The model is just identified if the number of "knowns" is equal to "unknowns". SEM users prefer to work with models that are "overidentified" – models where there are more knowns than unknowns. Models that are just identified yield a trivially perfect fit, making the test of fit uninteresting. Models that are overidentified – that have positive degrees of freedom – may not fit well, so the fact that such a model does fits well amounts to

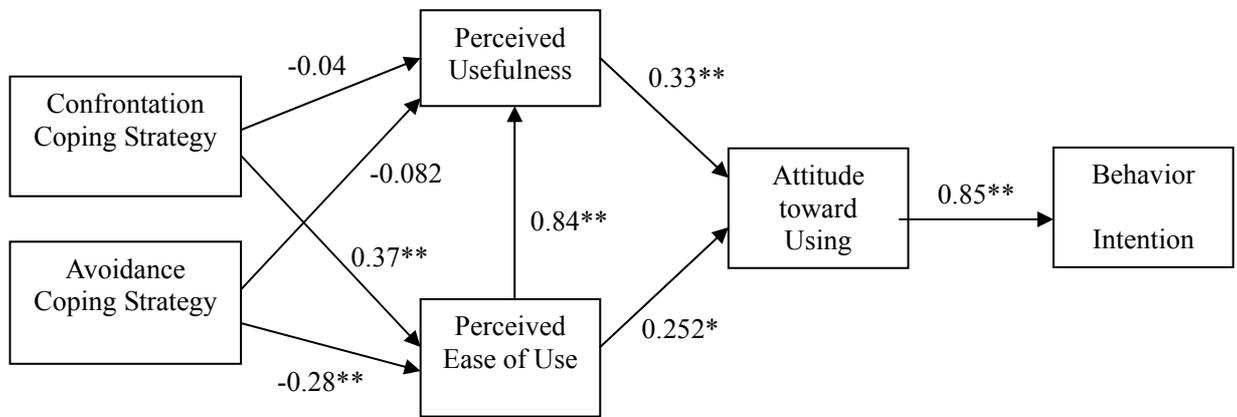
meaning full evidence in favor of the proposition that the model is indeed a reasonable representation of the phenomena in question (Davis, 1993, McDonald, 1982).

In order to decide whether a model is identified, Amos examines the rank of the matrix of approximate second derivatives, and of some related matrices. There are heuristics available to determine whether a SEM is identified. Amos can detect and notify a range of identification problems. Amos also offers suggested remedies. The degree of freedom of our model is 96, which suggested our model is over-identified. However, as articulated earlier, the model is a reasonable representation of the phenomena in question. The model fit indexes are demonstrated in next section.

5.4.3 The results of SEM

The hypothesized structural model revealed a good model fit: $\chi^2/df=209.869/96=2.186$, ($p=0.000$); GFI=0.892; AGFI=0.847; NFI=0.887; CFI=0.934; RMSEA=0.074. The proposed model fits the data fairly well. Path analysis of the postulated relationships demonstrated a direct positive effect from confrontation coping strategy to ease of use ($B=0.374$, $p<0.05$), but effect from it to usefulness was found to be not significant ($B=-0.04$, $p=0.575$). The results show a direct negative effect of avoidance coping strategy on ease of use ($B=-0.281$, $p<0.05$); and the influence of avoidance coping strategy on usefulness is not significant ($B=0.082$, $p=0.254$). According to these statistics, hypothesis 6a, 6b were supported, hypothesis 5a and 5b were rejected. SEM also showed a direct positive effect from perceived usefulness to attitude ($B=0.334$), a direct positive effect from attitude to behavioral intention ($B=0.850$), a direct positive effect of perceived ease of use on attitude ($B=0.252$, significant at 0.1 level), and a large direct positive effect from perceived ease of use to perceived usefulness ($B=0.849$). All except the effect of ease of use on

attitude were significant at 0.05 level (please see Figure 7). Therefore, H1, H2, H3, H4 were supported by the empirical results.



Note: ** indicates $p < 0.05$; * indicates $p < 0.1$. $\chi^2/df=209.869/96$; GFI=0.892; AGFI=0.847; NFI=0.887; CFI=0.934; RMSEA=0.074.

Figure 7. Results of Structural Equation Model

5.4.5 Alternative models

As it is the first time to bring coping strategy into innovation adoption research, it is possible if the previous model is mis-specified. To minimizing this possibility, we also test alternative models according to the modification index provided by AMOS. We call original model M1. M2 and M3 are the modified models base on M1. We added the paths from CCS and ACS to attitude in M2, and to BI in M3. The results are listed in the table 7. According to the path coefficients of the newly-added paths, none of them is significant (ACS→atti: 0.064, CCS→atti: 0.102, ACS→BI: -0.041, CCS→BI: 0.014). Model fitness of M2 and M3 is not better than M1 or even worse. These evidences show that M1 is better than M2 and M3.

Table 7. Model Comparisons

Model	Model Fitness	Estimated Standardized Coefficient (**: $p<0.05$, *: $p<0.1$)
M0 (TAM)	$X^2/df=83.687/40=2.092$ GFI=0.936 AGFI=0.895 NFI=0.944 CFI=0.969 RMSEA=0.071	Use→atti: 0.44** ease→use: 0.78** ease→atti: 0.15* atti→bi: 0.85**
M1	$X^2/df=209.869/96$; AGFI=0.847; NFI=0.887; RMSEA=0.074. GFI=0.892; CFI=0.934;	CCS→use: -0.04 ACS→use: -0.082 CCS→ease: 0.37** ACS→ease: -0.28** use→atti: 0.33** ease→atti: 0.252* ease→use: 0.849** atti→BI: 0.85**
M2	$X^2/df=206.776/94$; AGFI=0.846; NFI=0.889; RMSEA=0.075. GFI=0.894; CFI=0.935;	CCS→use: -0.029 ACS→use: 0.084 CCS→ease: 0.343** ACS→ease: -0.289** use→atti: 0.33** ease→atti: 0.237* ease→use: 0.845** atti→BI: 0.849** ACS→atti: 0.064 CCS→atti: 0.102
M3	$X^2/df=209.372/94$; AGFI=0.845; NFI=0.887; RMSEA=0.076. GFI=0.893; CFI=0.934;	CCS→use: -0.042 ACS→use: 0.084 CCS→ease: 0.375** ACS→ease: -0.284** use→atti: 0.339** ease→atti: 0.244* ease→use: 0.850** atti→BI: 0.842** ACS→BI: -0.041 CCS→BI: 0.014

The SEM results of TAM (M0) are also included in the table 7. The results of model fitness show that current model (M1) may not be better than M0, because more degree of freedom is added to M1 than M0, but M1 explains adoption better

and efficient than TAM. Also, M1 and M0 are actually not nested models but two different models, so that Chi-square difference test can not be used to test the model fit improvement and the model fit of M1 is acceptable. Moreover, our focus of this research is not to improve TAM, but to explore the consumer decision process. The M1 can provide more information about consumers' behaviors than TAM. M1 proves to be the best model, which fits the data reasonably well.

5.5 Consumer profiles

To explore the perceptions and demographics of consumers who adopt different coping strategies' groups, we use T-TEST and crosstabulations to analyze them. Apparently, in the five coping strategies, a consumer can only adopt one coping strategy in the face of innovation product. Therefore, we treat the one coping strategy with highest mean score among five coping strategies as respondent's first choice, when he/she faces an innovation product. Accordingly, based on the typology of coping strategies we discussed, we code the variable "choiceca" equals to "0" if respondent's first choice is avoidance coping strategy: ignore, refuse or delay. The "choiceca" equals to "1" if his first choice is a confrontation coping strategy: EDM, or pretest. To test coping strategies' effect on each perception, we run a T-TEST using perceptions (usefulness, ease of use, fun, risk, quality, and cost) as the dependent variables and coping strategy as group factors. As shown in Table 8, the effect of coping strategy on usefulness, ease of use, and fun is significant at 0.05 level ($p=0.035$, $p=0.018$, $p=0.002$). Mean of each variable is increased by 0.37, 0.35, 0.53 respectively from group=0 to group=1. The effects of coping strategies on quality, cost, and risk are not significant. The T-TEST result suggests that consumers with confrontation coping strategies tend to perceive innovation products more useful, easier to use, more fun, and these consumers have higher innovativeness.

To find demographic difference of people in each group, we run crosstabs in SPSS on: age, gender, education, and income, since they are categorical variables. Table 9 -13 show the crosstabs results of age*choiceca, gender*choiceca, education*choiceca and income*choiceca, respectively. We can see differences of all demographics data are not significant across the groups. It means consumers' demographics data such as age, gender, education, and income do not influence their

coping strategies. Therefore, the factors' influence on consumers' coping strategies needs further studies to explore.

Table 8. Independent Samples T-test

	Group	N	Mean	t	Sig.
USE	0	99	3.8249	-2.121	.035
	1	114	4.1930		
EASE	0	99	4.0606	-2.391	.018
	1	114	4.4181		
FUN	0	99	3.7391	-3.097	.002
	1	114	4.2039		
RISK	0	99	4.2652	0.672	.502
	1	114	4.1696		
INNO	0	99	2.8493	-4.660	.000
	1	114	3.6184		
QUALITY	0	99	4.1212	0.227	.821
	1	114	4.0947		
COST	0	99	3.7929	-1.626	.105
	1	114	3.9846		

Note: group=0, consumers with avoidance coping strategy
group=1, consumers with confrontation coping strategy

Table 9. CHOICECA * AGE Crosstabulation

	AGE			Total
	(0,25]	(25, 40]	(40, 61]	
Avoidance coping strategy	52 54.2%	30 31.3%	14 14.6%	96 100%
Confrontation coping strategy	67 63.8%	24 22.9%	14 13.3%	105 100%

Pearson Chi-Square: 2.159
Df: 2
Asymp. Sig. (2-sided): 0.340

Table 10. CHOICECA * GENDER Crosstabulation

	GENDER		Total
	Male	Female	
Avoidance coping strategy	46 45.5%	55 55.5%	101 100%
Confrontation coping strategy	51 44.7%	63 55.3%	114 100%

Pearson Chi-Square: 0.14
Df: 1
Asymp. Sig. (2-sided): 0.905

Table 11. CHOICECA * EDUCATION Crosstabulation

	EDUCATION		Total
	0	1	
Avoidance coping strategy	39 38.6%	62 61.4%	101 100%
Confrontation coping strategy	47 41.2%	67 58.8%	114 100%

Pearson Chi-Square: 0.152
Df: 1
Asymp. Sig. (2-sided): 0.696

Note: EDU=1: bachelor and above; EDU=0: below

Table 12. CHOICECA * INCOME Crosstabulation

	INCOME			Total
	1	2	3	
Avoidance coping strategy	80 81.6%	15 15.3%	3 3.1%	98 100%
Confrontation coping strategy	85 85.3%	15 14.3%	5 4.8%	105 100%

Pearson Chi-Square: 0.411
Df: 2
Asymp. Sig. (2-sided): 0.814

Note: income=1: income<=20000; income=2: 20000<income<=50000;
income=3: income>50000

CHAPTER 6. DISCUSSION

6.1 Conclusions and discussions

Innovation adoption is a complicated but important issue from both theoretical and practical perspectives, because the characteristics of innovation products are continuously changing and consumer's decision-making process is a psychological process and difficult to follow. Particularly, nowadays innovation products are no longer treated as always beneficial, but rather paradoxical and stressful. Thus, even if innovation adoption has been extensively studied, it still needs new insight into the changing realities. The present study tried to examine how consumers tend to cope with innovation products, and how coping strategies affect their perception of innovations. Moreover, empirical data from the adoption of 3G wireless services in Hong Kong was used to test the hypotheses.

This study has several important findings. First, the reliability test and CFA suggest that coping strategies are plausible theoretical constructs that can be used for theory development and testing. Second, the present study has verified the proposed model discussed in Chapter 3 in the context of consumers' acceptance of 3G mobile services in Hong Kong. The findings reconfirm the significance of TAM in predicting consumers' adoption of technology-based innovations. Hypothesis 1, 2, 3, 4, 6a, 6b were supported and 5a, 5b were rejected by the current results. Specifically, the confrontation coping strategy has a significant direct positive effect on ease of use, while avoidance coping strategy has a significant negative effect on ease of use. However, the effects of both types of coping strategy on usefulness were found not significant. It is probably because 3G phone is continuous innovation, and its relative advantage is not obvious in comparison with the existing products. It is consistent

with the result of Strutton, Lumpkin & Vitell's research (1994). They suggest that when marketing continuous innovations should focus on the economic advantages and ease of use associated with the product, whereas when marketing discontinuous innovation, marketing efforts should primarily focus on addressing the relative advantage and observability of the innovation. Currently, majority of Hong Kong people have more than one mobile phone, so people are prone to conceive that a 3G phone is just another mobile phone. In addition, there are too many substitutes of 3G phone in this modern society such as Internet, digital camera, and PSP (Play Station Portable). Therefore, people may not regard 3G phone significantly more useful regardless of their coping strategies.

TAM is validated again in this research. Perceived usefulness is found a robust predictor of consumers' attitude towards using 3G phone, and it affects their behavioral intention. Direct effect of perceived ease of use on attitude is found not as strong as perceived usefulness. It is significant at 0.1 level. The effect of ease of use is 80% mediated by perceived usefulness. It is an interesting finding for the 3G phone industry. Moreover, the estimated standardized coefficient of attitude on behavioral intention is 0.85, which demonstrates a strong relationship of attitude and BI.

Second, based on the literature, we discussed the effect of consumers' past experiences on their adoption decisions. Given the new characteristics of today's innovation products and incorporating past experiences, we develop the coping strategies to study how consumers tend to deal with innovation products. Previous studies neglect the importance of consumers' experience and treat the innovations as all beneficial. Consumer's knowledge in related products category is vital to his adoption decision, but willingness to learn about the innovation is even more

important. Current research attempts to bridge the gap by showing various paradoxes and stress that innovation products bring to consumers and the coping strategy as a key to explain consumers' heterogeneity in their adoption behavior.

Third, the formation of consumer's perception of innovation products was discussed. The role of coping strategies was explored. Alternative models were tested to validate the coping strategies' effects. One alternative model includes two more paths from confrontation coping strategy and avoidance coping strategy to attitude, the other one added two more paths from CCS and ACS to behavioral intention. The results show that there is no improvement in either model. These findings validated our proposed role of coping strategies, which influence consumers' perceptions, not attitude or behavioral intention.

Fourth, the results of T-TEST demonstrate that coping strategies not only influence consumers' perceptions (usefulness, ease of use, and fun) but also influence their innovativeness. However, the associations of demographics of consumers and their coping strategies are weak and not significant. The results suggest consumers' coping strategies are not influenced by their age, income, education, and gender.

6.2 Implications

This research contributes to both the theoretical research and practical implications of the technology-based innovation adoption. A major contribution of this research is that coping strategies are found to have direct effect on consumers' perceptions of innovation products. It helps explain the consumers' heterogeneity in terms of peoples' personality, past experience with innovation products and how they cope with technology paradoxes and techno-stress. Traditional adoption theory is too simple to predict the current consumers' behavior, since previous studies neglect

stress, uncertainties, and paradoxes brought to consumers by innovations. Also, previous studies have not explored how consumers' past experiences would affect their learning styles, information search behaviors and in turn affect their perceptions towards certain innovations. Thus, there is a gap existed in previous researches regarding consumer's adoption decision process. This research bridges this gap by using coping strategy. Coping strategies influence consumers in terms of whether they would like to know about the innovations, search information about innovations, and in turn influence their perceptions on products. It is an important tache in consumers' adoption decision process. Therefore, consumers' coping strategies based on their past experiences play an important role in predicting the consumer's adoption.

Another contribution of this research is the development of measures of coping strategies. Coping strategies have become more important in innovation adoption research, as consumers nowadays are propelled to cope with continuous influx of information, innovations and pressures. Operationalization of coping strategies can help build a foundation to examine its role in influencing consumers' adoption decision process.

The results also provide insights for diffusion agents, such as marketing managers and public policy makers, who are interested in the dissemination of technology-based innovations. As discussed in our research, consumers can be segmented into five groups. As people with confrontation coping strategies (EDM and Pretest) are actually quite interested in the innovation products and are potential users of innovation products, and they are not necessarily innovators and early majority. Marketers may lose a big market by only targeting innovators and early majorities. Instead, they can implement various marketing strategies to attract people

with confrontation coping strategies. It is advised that marketers adopt different marketing strategies for different groups of consumers. For those consumers who adopt extended decision making to cope with the innovation products, the effective way to shorten their time span of searching information is to tell consumers the most appealing characteristics of the innovation product and stimulate consumers' interest to search. For those consumers who are used to pretest the innovation products, an arrangement of free trial would help them make a quick decision.

It seems that it is difficult to change the minds of consumers who adopt delay, ignore and refuse strategies, since they avoid any innovations or any information of them. However, marketers can try to reduce the possibility for these consumers to adopt avoidance coping strategies. As we discussed earlier, the reasons why consumers adopt avoidance coping strategies are three folds. First, innovation products are considered paradoxical and stressful. Second, consumers have unsatisfied experiences with previous innovations, thus they have lost confidence in innovations. Third, consumers may feel that the innovation products will soon become obsolete and they are tired of following the fashion. To solve these problems, marketers should first try to minimize the paradoxes in the innovation designing process and try to reduce the stress on consumers. Second, they should always give consumer an enjoyable experience so that they will use confrontation coping strategies in face of an innovation product. Third, marketer need to find the right time to execute innovation product. It means introduction rates of innovation will necessarily be slowed down due to risk, finances, and time requirements. The decision on the time to introduce a new version of innovation product should take into account the adoption situation of its former product in the market.

If the innovative product is multi-generation innovation, marketers can focus

promoting the new and strong functions of the product, because consumers' coping strategy does not affect people's perceived usefulness of these kinds of new products. Thus, consumers' perceived usefulness of multi-generation innovation may be dominantly influenced by advertisement, promotion or word of mouth. It is more effective for marketers at this time to attract consumers by showing the product's usefulness than ease of use.

In addition, one of the reasons why consumers have to cope with technology innovation products is that these kinds of products require more consumers learning. A common mistake the manufacturers make is to prepare a sophisticated and detailed perfect manual to compensate. Ricoh, in a survey of its fax users, determined that nearly 95 percent never used three key features it deliberately built into the machines to make them more appealing, even with a perfect manual. Thus, design of an innovation product should be based on one principle: make its benefits obvious to the consumers. A product should be designed so that when consumers look at it, they understand it and know how to use it.

6.3 Limitations and suggestions

The limitations of the study are: (1) the chosen setting, (2) sample size, (3) lack of knowledge of what influence consumers' coping strategies (4) that measurements are only based on Mick and Fournier's research. One limitation was that choosing only one product and only one market in this research lacks generalizability. As a multi-generation innovation product, 3G phone's technology and function improvement is not profound, thus consumers' coping strategies may not be as important. Learning process is not emphasized that much as everyone has already been so familiar with mobile phones. Techno-stress caused by 3G wireless

mobile services is not so serious. Another limitation in the present study is the small sample size. It restricts our ability to explore the differences among five coping strategies. In addition, the sample consisted of Hong Kong residents is also limited, as Hong Kong is a small and special place. Hong Kong people are more fashionable than those in other places. Another limitation is that we did not have the data to study what factors influence the formation of coping strategies, which may provide valuable insights for marketers. If marketers know what are the key and obvious factors affecting consumers' coping strategies, they can easily make use of these most appealing information to do segmentation, promotion and position of a new product. Furthermore, the measurements of coping strategies are based on Mick and Fournier's interview findings, which are not so generalizable. Because coping strategies have been studied a lot in the stress management literature, more references of their measurement in that field may improve generalizability of this study.

Several key implications deserve the attention of future research as a result of the findings and limitations of this study. First, the measurement of the coping strategies still needs improvement. As five coping strategies discussed in our research cannot include all the strategies consumers would adopt, more coping strategies need to be explored. Future research can also consider the measurement of the coping strategies in psychology and develop more generalized scales. Second, since it is the first time to study the role of coping strategies in people's consumption decision process, it should be further discussed and validated. The results of this study show that the standardized path coefficient of between attitude and BI is so high, in a sense, BI becomes attitude. Thus, testing the effect of coping strategies on "usage/adoption" is necessary. Especially, coping strategies may directly affect

consumers' adoption behavior of continuous innovative product; while in facing of discontinuous innovations, coping strategies plays a more important role in influencing consumers' perceptions. That is to say, comparing the coping strategies' role in different innovation categories can provide profound insights in both a theoretical and practical sense. Also, coping strategy's role is studied in the framework of TAM in this research, so the limitation of TAM itself may restrain our ability to study the role of coping strategy. Future research can explore its role in different adoption frameworks.

Third, people from other countries and geographic regions should be explored to improve the understanding of consumers' coping strategies and factors that are likely to influence their coping strategies. Testing the model and the proposed measurement scales from other geographical regions and cultures is necessary to see if the model and the proposed measurement scale will hold. Fourth, the factors that influence the formation of coping strategies need to be explored. If possible, findings about the changing trends of consumers' coping strategies will help marketers better understand consumer behavior and their decision process. Last but not least, quantitative studies are needed to test consumers hold enduring coping strategies instead of changing from time to time.

Appendix A: Descriptive Statistics of Respondents' Demographics

Category	Respondents (n)	Respondents (%)
GENDER		
Male	97	45.1%
Female	118	54.9%
AGE		
19 and younger	54	21.9%
20-29	99	51.2%
30-39	22	10%
40-49	26	12.9%
50-59	7	0.5%
60 and older	3	1.5%
EDUCATION		
Primary school or below	5	2.3%
Form 1 to Form 3	6	2.8%
Form 4 to Form 5	40	18.5%
Form 6 to Form 7	13	6.0%
Post secondary	13	6.0%
Associate degree	9	4.2%
Degree	77	35.6%
Master	42	19.4%
Doctor	10	4.6%
OCCUPATION		
Magistrate or Manager	22	10.4%
Professional	40	19.0%
Technician or Paraprofessional	2	0.9%
Office Clerk	24	11.4%
Salesman	10	4.7%
Service industry personnel	6	2.8%
Workers of Farm, Fishery, Animal husbandry, Forest Industry	1	0.5%
Technologist or worker of related fields	3	1.4%
Device and machine operator of fitter	0	0
Unskilled worker	1	0.5%
Else	102	48.3%
INCOME (HKD)		
5000 and below	80	39.4%
5000-10000	32	15.8%
10000-20000	53	26.1%
20000-50000	30	14.8%
50000-100000	7	3.4%
100000 and above	1	0.5%

Appendix B: The Questionnaire

Factors Influencing Adoption of the Third Generation of Mobile Phone

Instructions for Completing the Questionnaire

Please read the questions carefully and follow the instructions when answering the questions.

1. What is 3G?

It is the generic term for third generation mobile phone technologies. 3G will bring very high speed connections to cellular phones, thus enabling video conference and other applications requiring broadband connectivity to the Internet.

2. The major differences between 3G and 2.5G phone:

[1] The connection speed of 3G phones is about 10 times faster than 2.5G.

[2] The latency of 3G phone is 3 or 5 times shorter than 2.5G.

[3] The memory of 3G phone is about 10 times larger than 2.5G. For example, by using a 3G phone, it is capable to download a 300K Java game, but by using a 2.5G phone, only much less than 100K Java game can be downloaded.

[4] 3G phone provides more stable and clearer pictures.

[5] 3G phone delivers enough waiting time.

[6] A greater variety of multimedia services are offered by 3G company.

3. Most questions are followed by a set of choices labeled as 1, 2, 3..., and so on. Please indicate your answer by circling the number or ticking the box that corresponds to your answer. If you have not used 3G phone before, please try to make your best inference according to your existing knowledge of 3G phone.

4. In some cases, you need to put the specific information requested into the space next to the question. Please kindly answer all the applicable questions to your best knowledge. Leaving the answers blank would reduce the usefulness of the information.

5. Should you have any questions about the research, please contact me directly.

Part A. Information about 3G services

1. On the scale of 1-7, please respond to the following statements regarding **usefulness of 3G services** by circling the number that corresponds to your feeling.

Please note:	1= Absolutely Disagree	2= Strongly Disagree	3= Somewhat Disagree	4= Neutral	5= Somewhat Agree	6= Strongly Agree	7= Absolutely Agree
1 I find 3G services useful in my life.	1	2	3	4	5	6	7
2 3G services provide people more control over their daily lives.	1	2	3	4	5	6	7
3 I like the idea of surfing the Internet and watch football game via 3G phones because I am not limited to certain places.	1	2	3	4	5	6	7
4 3G phone gives me more freedom and mobility.	1	2	3	4	5	6	7
5 3G phone is functional.	1	2	3	4	5	6	7
6 3G service provides a wider range of services than regular mobile services.	1	2	3	4	5	6	7

2. Please respond to the following statements regarding **ease of use of 3G services**.

Please note:	1= Absolutely Disagree	2= Strongly Disagree	3= Somewhat Disagree	4= Neutral	5= Somewhat Agree	6= Strongly Agree	7= Absolutely Agree
1 I find 3G phone easy to use.	1	2	3	4	5	6	7
2 3G services are convenient.	1	2	3	4	5	6	7
3 Learning to use 3G phone is easy for me.	1	2	3	4	5	6	7
4 It requires few and clear steps when adopt a certain 3G multimedia service.	1	2	3	4	5	6	7
5 3G phone provides efficient help functions, clear graphic layout and symbols to guiding me how to use a particular service.	1	2	3	4	5	6	7
6 I find it easy to locate the information that I need through a 3G phone.	1	2	3	4	5	6	7

3. We would like to know about the enjoyment coming together with 3G services. Please respond to the following statements regarding **fun brought by 3G services** by circling the number that corresponds to your feeling.

Please note:	1= Absolutely Disagree	2= Strongly Disagree	3= Somewhat Disagree	4= Neutral	5= Somewhat Agree	6= Strongly Agree	7= Absolutely Agree
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1	I have fun using 3G services.	1	2	3	4	5	6	7
2	I find using 3G services to be enjoyable.	1	2	3	4	5	6	7
3	3G services make my life more colorful.	1	2	3	4	5	6	7
4	Some 3G services are of fun.	1	2	3	4	5	6	7

4. How do you identify the **innovativeness of yourself**? Please circle the number that corresponds to your feeling.

Please note:	1= Absolutely Disagree	2= Strongly Disagree	3= Somewhat Disagree	4= Neutral	5= Somewhat Agree	6= Strongly Agree	7= Absolutely Agree
---------------------	------------------------------	----------------------------	----------------------------	---------------	-------------------------	-------------------------	---------------------------

1	In general, I am among the first in my circle of friends to acquire a new mobile service when it appears.	1	2	3	4	5	6	7
2	Compared to my friends, I seek out relatively more information about new mobile multimedia services.	1	2	3	4	5	6	7
3	If I hear that a new kind of 3G services is available, I will be very interested to adopt it.	1	2	3	4	5	6	7
4	I know about new 3G services before most other people in my circle do.	1	2	3	4	5	6	7
5	Even if I know a new mobile phone will become popular, I am not interested to buy it.	1	2	3	4	5	6	7

5. Please indicate your level of agreement/disagreement on the following statements regarding the **perceived risk of 3G service** using a 7-point scale.

Please note:	1= Absolutely Disagree	2= Strongly Disagree	3= Somewhat Disagree	4= Neutral	5= Somewhat Agree	6= Strongly Agree	7= Absolutely Agree
---------------------	------------------------------	----------------------------	----------------------------	---------------	-------------------------	-------------------------	---------------------------

1	I worry that information I send over the 3G phone will be seen by other people or other companies.	1	2	3	4	5	6	7
2	Mistakes are more likely to occur with 3G service providers than with regular ones.	1	2	3	4	5	6	7
3	When I use 3G mobile banking, my money is not as safe as when I use regular banking services.	1	2	3	4	5	6	7
4	I characterize the decision to transact through a 3G phone to be significantly risky.	1	2	3	4	5	6	7
5	I think it is risky to buy movie ticket through 3G phone, because my account may be invaded.	1	2	3	4	5	6	7

6. Please indicate your level of agreement/disagreement on the following statements regarding **your opinion about quality and cost of 3G services** on a 7-point scale.

Please note:	1= Absolutely Disagree	2= Strongly Disagree	3= Somewhat Disagree	4= Neutral	5= Somewhat Agree	6= Strongly Agree	7= Absolutely Agree
1 The speed of connection between 3G phone and the Internet is satisfactory.	1	2	3	4	5	6	7
2 The interface of a 3G phone is user friendly.	1	2	3	4	5	6	7
3 The coverage of 3G services is satisfied.	1	2	3	4	5	6	7
4 The network of 3G phone is stable and reliable.	1	2	3	4	5	6	7
5 3G phone provides clearer and more stable pictures.	1	2	3	4	5	6	7
6 3G service providers ensure quality of 3G services.	1	2	3	4	5	6	7
7 The price charged for most of 3G services is reasonable.	1	2	3	4	5	6	7
8 The time contributed to acquiring a particular 3G service is reasonable	1	2	3	4	5	6	7
9 The prices of 3G phones are reasonable.	1	2	3	4	5	6	7
10 The amount of time needed for 3G phone prepurchasing behavior is reasonable.	1	2	3	4	5	6	7

7. What kind of strategy you will adopt when in face of a new product or service? Please respond to the following statements on the scale of 1-7 regarding **your coping strategy of 3G services**.

Please note:	1= Absolutely Disagree	2= Strongly Disagree	3= Somewhat Disagree	4= Neutral	5= Somewhat Agree	6= Strongly Agree	7= Absolutely Agree
1 The prior experience with new technological products similar to 3G phone is positive.	1	2	3	4	5	6	7
2 The prior experiences with similar new technological based services are extensive.	1	2	3	4	5	6	7
3 I am accustomed to avoiding information about the characteristics or availability of any innovations.	1	2	3	4	5	6	7
4 I tend to show indifference towards any information about any innovations.	1	2	3	4	5	6	7
5 I am accustomed to ignore the existence of an innovation.	1	2	3	4	5	6	7
6 I am used to declining the opportunity to own a new product or service.	1	2	3	4	5	6	7
7 I always have no interest in getting to know any new product or service.	1	2	3	4	5	6	7

8	I always refuse other people's persuasion to buy any new product or service.	1	2	3	4	5	6	7
9	I am always not concerned of information of any new products or service.	1	2	3	4	5	6	7
10	I do not even take a quick look at the information about new products or service, even if I have a lot of information at hand.	1	2	3	4	5	6	7
11	I will not buy the innovation products until my own product is exhausted.	1	2	3	4	5	6	7
12	I will not buy the innovation products until my own was out of date.	1	2	3	4	5	6	7
13	I tend to delay the adoption of new products to avoid the phenomenon that innovation products mostly get out of date soon.	1	2	3	4	5	6	7
14	Most of new products have flaws or not mature enough, thus I tend to delay the adoption.	1	2	3	4	5	6	7
15	I am accustomed to delay adoption of innovation products.	1	2	3	4	5	6	7
16	It is much easier for me to make an adoption decision when a trial is offered in the shop.	1	2	3	4	5	6	7
17	In face of an innovation, I would purchase one but not assuming definitive ownership until the return policy or warranty expires.	1	2	3	4	5	6	7
18	Facing a new product, I tend to ask for a trial all the time.	1	2	3	4	5	6	7
19	I can make an adoption decision more easily if the new product can be returned to shop freely during a certain period.	1	2	3	4	5	6	7
20	I check all the functions of a new product in the duration of the return period.	1	2	3	4	5	6	7
21	I tend to search diligently for detailed new product/brand.	1	2	3	4	5	6	7
22	In face of new products, I always compare all the alternative brands and buy the most suitable one.	1	2	3	4	5	6	7
23	I tend to take stock of my needs, actively ask for my friends or experts' suggestions, and finally buy the right one.	1	2	3	4	5	6	7
24	I tend to purchase a product in a careful, calculating manner.	1	2	3	4	5	6	7
25	I will not make the adoption decision of a new product until I am familiarized with it.	1	2	3	4	5	6	7
26	Innovation products can always attract my attention, so that I feel uncomfortable if I do not buy them.	1	2	3	4	5	6	7
27	Once an innovation product is introduced to market, I will buy it without any hesitation.	1	2	3	4	5	6	7
28	I will buy every innovation products and service immediately.	1	2	3	4	5	6	7
29	Once I hear that an innovation product emerges, I will buy it at the first time.	1	2	3	4	5	6	7

30	When some people tend to introduce me new products, I always reject them.	1	2	3	4	5	6	7
31	I am always the first one to buy innovation products.	1	2	3	4	5	6	7
32	Once a new product is introduced, I always find out my real needs, and search information about it, finally consider whether buy or not.	1	2	3	4	5	6	7
33	I always delay but finally own a new product.	1	2	3	4	5	6	7
34	I always buy a basic, less sophisticated product.	1	2	3	4	5	6	7
35	Most of innovation products have not helped much in improving people's life quality.	1	2	3	4	5	6	7
36	I always buy a familiar, widely known brand.	1	2	3	4	5	6	7
37	I always ask for a trial, when new products are introduced to market.	1	2	3	4	5	6	7
38	When a new product is just introduced, I always wait and see other people's adoption, then decide whether I need it or not.	1	2	3	4	5	6	7
39	I do not have any interest in adopting new products.	1	2	3	4	5	6	7
40	I always buy the most expensive model.	1	2	3	4	5	6	7
41	It is wise and economical to use my own model.	1	2	3	4	5	6	7
42	I always purchase a reliable model.	1	2	3	4	5	6	7
43	I always try to use someone else's product temporarily.	1	2	3	4	5	6	7
44	I tend to buy new product after mine is broken.	1	2	3	4	5	6	7
45	I always buy the latest, cutting-edge model.	1	2	3	4	5	6	7
46	I always spend much time and effort to know a new product, and then make the adoption decision.	1	2	3	4	5	6	7
47	It is better to wait before adopting a new product.	1	2	3	4	5	6	7
48	I am accustomed to make the best use of my own product.	1	2	3	4	5	6	7
49	I always keep using my own product, as long as it can satisfy most of my needs.	1	2	3	4	5	6	7
50	I always find some unbearable aspects of innovations, so that I refuse to adopt them.	1	2	3	4	5	6	7
51	I do not buy new products until my own models cannot satisfy my needs.	1	2	3	4	5	6	7
52	It is sometimes a waste to buy innovation products, since most existed products are sophisticated.	1	2	3	4	5	6	7

53	I like to buy innovation products.	1	2	3	4	5	6	7
54	I hate to buy innovation products.	1	2	3	4	5	6	7
55	I always buy a familiar product.	1	2	3	4	5	6	7
56	It is not wise to buy the cutting-edge products.	1	2	3	4	5	6	7
57	I always delay the adoption of innovation products, even if they are needed.	1	2	3	4	5	6	7
58	I am a fan of technology innovations.	1	2	3	4	5	6	7
59	People can lead a good life without innovations.	1	2	3	4	5	6	7
60	I always make the final adoption decision in the end of returning period.	1	2	3	4	5	6	7

8. Please indicate your general attitude about 3G services and how likely you will adopt any 3G services in the following positions. Please check or circle the appropriate category that applies to you.

Please note:	1= Absolutely Disagree	2= Strongly Disagree	3= Somewhat Disagree	4= Neutral	5= Somewhat Agree	6= Strongly Agree	7= Absolutely Agree
1	In general, I have a positive opinion about 3G phone.						
2	For me, adopting a 3G service is a good idea.						
3	For me, using a 3G service is a wise idea.						
4	Given the chance, I predict that I should buy a 3G phone in six month.						
5	Given the chance, I predict that I should adopt any 3G service in the future.						
6	It is likely that I will perform transaction through 3G phone.						

Part B Personal Particulars

Please complete the description of yourself. Again, you are assured that all responses are ANONYMOUS and reported in the aggregate for research purposes only.

1. I am:

Male Female

2. Age: _____

3. Education:

- | | | |
|--|---|---|
| <input type="checkbox"/> Primary School or below | <input type="checkbox"/> Form 1 to Form 3 | <input type="checkbox"/> Form 4 to Form 5 |
| <input type="checkbox"/> Form 6 to Form 7 | <input type="checkbox"/> Post Secondary | <input type="checkbox"/> Associate Degree |
| <input type="checkbox"/> Degree | <input type="checkbox"/> Master | <input type="checkbox"/> Doctor |

4. Occupation:

- | | | |
|--|---|--|
| <input type="checkbox"/> Magistrate or Manager | <input type="checkbox"/> Professional | <input type="checkbox"/> Technician or Paraprofessional |
| <input type="checkbox"/> Office Clerk | <input type="checkbox"/> Salesman | <input type="checkbox"/> Service industry personnel |
| <input type="checkbox"/> Workers of Farm, Fishery, Animal husbandry, Forest Industry | <input type="checkbox"/> Technologist or worker of related fields | <input type="checkbox"/> Device and machine operator of fitter |
| <input type="checkbox"/> Unskilled worker | <input type="checkbox"/> Else | |

5. Monthly salary: (If you are a student, please choose the amount of disposable income or monthly allowance).

- | | | |
|--|--|---|
| <input type="checkbox"/> 5000HKD or less | <input type="checkbox"/> 5001-10000HKD | <input type="checkbox"/> 10001-20000HKD |
| <input type="checkbox"/> 20001-50000HKD | <input type="checkbox"/> 50001-100000HKD | <input type="checkbox"/> 100001HKD or above |

6. Do you currently own a 3G phone?

yes no

7. How long your current mobile phone has been used: _____

8. How much you spend on mobile phone every month (including monthly subscription fee, and subscription fee for other mobile services):

- | | | | |
|---|-------------------------------------|---|--------------------------------------|
| Less than \$50 <input type="checkbox"/> | \$50-\$100 <input type="checkbox"/> | \$101-\$300 <input type="checkbox"/> | \$301-\$500 <input type="checkbox"/> |
| \$501-\$1000 <input type="checkbox"/> | | More than \$1000 <input type="checkbox"/> | |

Thanks for your participation!

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