THE UPSIDE OF IRRATIONALITY: HOW COGNITIVE BIASES AFFECT CUSTOMER SATISFACTION
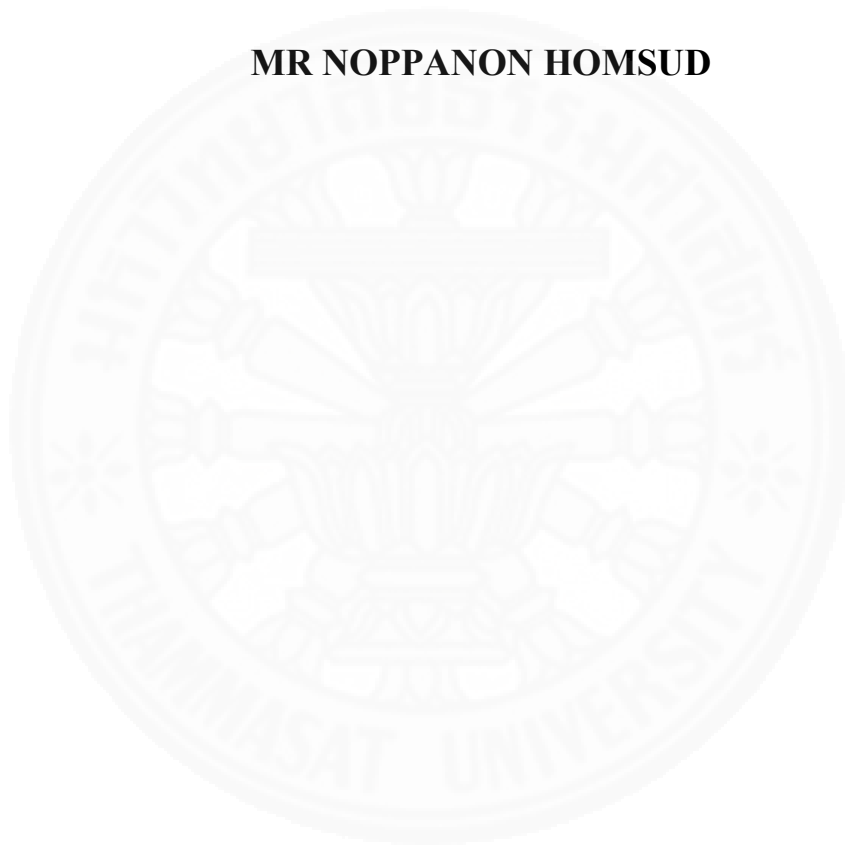
BY

MR NOPPANON HOMSUD

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY (BUSINESS ADMINISTRATION)
FACULTY OF COMMERCE AND ACCOUNTANCY
THAMMASAT UNIVERSITY
ACADEMIC YEAR 2019
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DISSERTATION

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ENTITLED

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CUSTOMER SATISFACTION

was approved as partial fulfillment of the requirements for

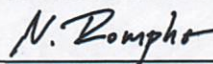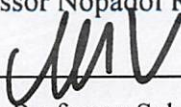the degree of Doctor of Philosophy (Business Administration)

on May 25, 2020

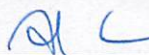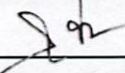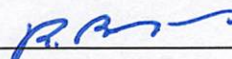|	
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Dissertation Title	THE UPSIDE OF IRRATIONALITY: HOW COGNITIVE BIASES AFFECT CUSTOMER SATISFACTION
Author	Mr. Noppanon Homsud
Degree	Doctor of Philosophy (Business Administration)
Faculty	Faculty of Commerce and Accountancy
University	Thammasat University
Dissertation Advisor	Professor Nopadol Rompho, Ph.D.
Academic Years	2019

ABSTRACT

Customer satisfaction is the priority of industries, companies, and consumers. Many empirical studies show that customer satisfaction is the key to profitability. One factor that is believed to affect customer satisfaction is cognitive bias, a mental phenomenon that causes an error in human thinking and decision-making, mostly associated with memory.

This study is grounded in the theory of mind, which contends that the cognitive state is a prerequisite of the affective state. The cognitive state is represented by cognitive bias, while the affective state is represented by customer satisfaction. The study explores various aspects of cognitive bias, namely, heuristic bias (represented by the anchoring effect), overconfidence bias (represented by the illusion of control), and choice bias (represented by the endowment effect).

Three main hypotheses are proposed. First, each facet of cognitive bias affects customer satisfaction. Second, gender moderates the relationship between cognitive bias and customer satisfaction. Third, the interaction effect between the various aspects of cognitive bias has a significant impact on customer satisfaction.

The proposed experimental design comprises eight scenarios (2 x 2 x 2 between-subject design) with a total of 524 participants. The scenarios are distinguished as manipulated/not manipulated by the anchoring effect, manipulated/not manipulated by the illusion of control, and manipulated/not manipulated by the endowment effect. Independent t-test, two-way ANOVA, and three-way ANOVA are used for analysis.

The anchoring effect, illusion of control, and endowment effect are found to have a significant impact on customer satisfaction. A moderating effect of gender is observed in the relationship between the anchoring effect and customer satisfaction and that between the endowment effect and customer satisfaction; however, no such effect of gender is found in the relationship between the illusion of control and customer satisfaction. The results further show that the interaction between the anchoring effect and illusion of control has no impact on customer satisfaction, the interaction between the anchoring effect and the endowment effect has a significant effect on customer satisfaction, the interaction between the illusion of control and the endowment effect has a substantial impact on customer satisfaction, and the interaction among the anchoring effect, illusion of control, and the endowment effect has no impact on customer satisfaction. It is because some pairs of cognitive biases do not share any similar extent.

This study provides several theoretical contributions. The effect of cognitive bias on customer satisfaction is empirically tested, supporting the existence of a significant relationship. The study's results support the theory of mind, which contends that the cognitive stage is a precondition of the affective stage of mind. In addition, based on the theory of mind, when stimulated by a cognitive state, women score higher on tests of the affective dimension than do men. However, this study finds that in one cognitive state, namely, illusion of control (representative of overconfidence bias), the relationship between the cognitive state and the affective state is similar for both genders. Last, based on the theory of mind, the interaction between cognitive states should have a significant impact on the affective state. This study, however, finds that not all cognitive mechanisms affect the affective state, as these cognitions must share similarities to some extent.

Keywords: Customer Satisfaction, Cognitive Bias, Theory of Mind, Anchoring Effect, Illusion of Control, Endowment Effect, Experimental Research, Thailand

ACKNOWLEDGEMENTS

This dissertation was completed with immense assistance from multiple parties who facilitated me during my study.

First all, I would like to express my sincere gratitude and sincere appreciation to Prof. Nopadol Rompho, Ph.D., my dissertation advisor who has been kind to me in advising and guiding me through beneficial dissertation procedures. Apart from what I have gained from this dissertation, humanity and role model as lecturer are the great things I have learned from my advisor; hence, I would attentively apply all good deeds to my way of life, and at last, my advisor would be my role model in every single way ever after.

Also, I would like to extend my appreciation to Prof. Sununta Siengthai, Ph.D., Assoc. Prof. Sakun Boon-Itt, Ph.D., Assoc. Prof. Alisara Charinsarn, DBA, and Asst. Prof. Surat Teerakapibal, Ph.D. for accepting to be the committee members in both the dissertation qualifying exam and the final defense; all comments and feedback truly complimented the study.

I gratefully acknowledge the support and generosity of Prof. Uthai Tanlamai, Ph.D. and Asst. Prof. Oranuj Soongswang, D.B.A. who have been my role models as a lecturer; without your kindness, I would not have decided to be a university lecturer. Every single step of my academic progress has reminded me of your generosity.

To Assoc. Prof, Phitak Siriwong, Ed.D., Saowakhon Nookhao, Ponlachai Petplod, Patcharin Phrarat, Asst. Prof. Kedwadee Sombultawee, Ph.D., Chuthamart Mekniti, Sunisa Wongprathum, Piyakarn Supanchanaburee, Sompong Promsa-ad, Natdanai Aleenajitpong, and Sirima Cheewaiya, thank you for all your helps during my dissertation and Ph.D. period. Time after time, I became despondent and was bombarded with loads of work, all of you were there bringing me to overcome all the difficulties.

Thank you Pattraporn Trongchookiat, Nammon Intawirat, and Supawan Limwilaikul, who were not only my students in class but also my partners: data collectors and coordinators assisting me throughout my course work and dissertation. I am thankful to you all.

Lastly, the only one wish of my beloved mother is to congratulate my achievement as a Ph.D. son. For my mother who has been devoting all her life to me, Ph.D. achievement is considered to be the greatest of the greats from her son. Besides, if there will be any virtue or praise for the dissertation, I do refer it to Pitchabhorn Homsud, my beloved and only daughter. What I have done until present would be a beginning of transmission from generation to generation, hopefully.
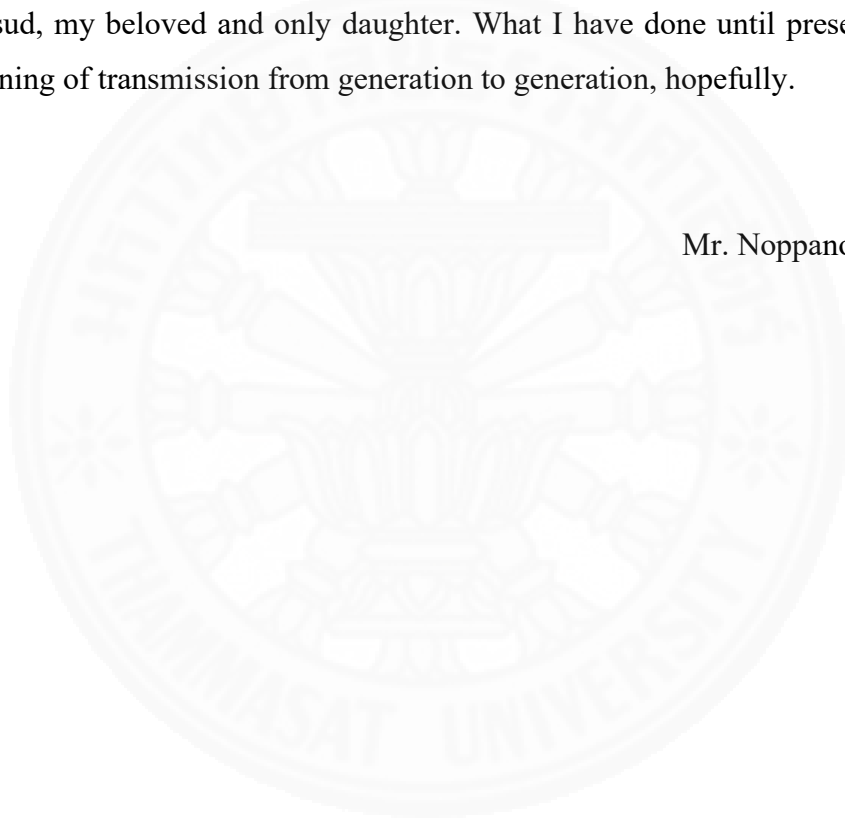
Mr. Noppanon Homsud

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CHAPTER 1

INTRODUCTION

1.1 Research background

The theory of mind is defined as the mental-state attributive ability of self and others, including beliefs, intention, and knowledge (Premack & Woodruff, 1978). It is characterised by a multidimensional process required for managing several components simultaneously (Amodio & Frith, 2006). A recent model distinguishes the cognitive component from the sub-processes of the affective component. 'Cognitive' is defined as the ability to implicate motivations and beliefs, while 'affective' is the ability to gather a person's feeling. In line with this model, the cognitive theory of mind is a precondition of the affective theory of mind (Shamay-Tsoory et al., 2010).

Theory of mind is used to explain the phenomenon in psychology and neuroscience. However, it is not used too much in marketing. Using theory of mind to adapt in marketing field can be broadened to a novel theory to explain phenomenon. This research selects cognitive biases as representative of cognitive state and selects customer satisfaction as representative of affective state. The main reason for selecting customer satisfaction is the heart of modern marketing thought and practice is customer satisfaction (Kotler et al., 2013). While understanding cognitive biases in decision making is the key to marketing success. The details of research background can explain correspondingly.

In the first step, the importance of marketing and customer satisfaction should be explained. Marketing is the business function that most frequently deals with customers. The heart of modern marketing thought and practice is creating value and customer satisfaction. Many argue that marketing is the key to success in every organisation (Kotler et al., 2013), whether public or private, service-based or product-based. Kotler et al. (2013) define marketing as managing profitable customer relationships. The American Marketing Association (AMA) defines the term 'marketing' as a set of institutions, activities, and processes that form, deliver, communicate, and exchange offerings of their value to partners, clients, customers, and

the broader society (Gundlach & Wilkie, 2009). Marketing inform business strategies that help obtain a competitive advantage, resulting in better corporate performance (Davcik & Sharma, 2016).

The concept of 'outside-in' marketing has been recently introduced to challenge inside-out marketing capabilities (e.g., product development, pricing, and marketing communication) with the argument of a company's static and insufficient capabilities to adjust itself to complications and fast-changing markets (Mu, 2015). Outside-in marketing is associated to higher efficiency, as well as increased profitability and competitiveness in the long run, as this strategy helps companies adjust to unstable market conditions (Saeed et al., 2015).

In a dynamic environment, characterised by fierce competition, companies require reliable indicators for measuring development, thus allowing managers to make better-informed decisions regarding their marketing investment (Kornelis, Dekimpe, & Leeflang, 2008; Leeflang et al., 2009). Hence, marketing metrics have become a top priority as a result of the corporate trend towards greater accountability for achieving value-added, lack of satisfaction with traditional marketing metrics, and the availability of Internet and other information technologies (Seggie, Cavusgil, & Phelan, 2007).

A key marketing metric is customer satisfaction, which is thought to exert a significant influence on internal metrics (Yeung & Ennew, 2000). Customer feedback is usually adopted for goal setting and performance monitoring of the metrics used as leading indicators of future business performance (Morgan & Rego, 2006). To operate business, from an agreement between academics and practitioners, customer satisfaction and loyalty achieving is considered a vital part of operation while loyal customer base establishing is a survival mean of all businesses (Gremler & Brown, 1996).

Various sizes and types of organisations have become aware of the essential role of customer satisfaction. Retaining existing customers is widely known to be less costly than seeking new customers and reflects the strong connection among profitability, customer satisfaction, and customer retention. Many organisations in the public sector use customer satisfaction as an indicator of success (Hill & Alexander, 2006).

Various organisations set customer satisfaction as their primary operational goal, heavily investing for improving their performance in areas that strongly contribute to customer satisfaction, such as customer service and quality. In the retail sector, loyalty schemes have proliferated and are now being widely adopted, with substantial investment in database marketing, customer planning, and relationship management. Public sector organisations have established customer charters to reflect their customer-service commitment, and many include customer satisfaction, such as the intention of delighting customers (Hill & Alexander, 2006), in their mission statement.

Customer satisfaction is the priority of industries, companies, and consumers (Oliver, 2015). From the customer's perspective, satisfaction seems to be the anticipated end-state of consumption or patronage, when the experience is positive. In addition, customer satisfaction reaffirms the customer's ability to make a decision (Oliver, 2015). For a company, customer satisfaction is crucial since word-of-mouth and watchdog-organisations generate satisfaction reports and tracking over time (Oliver, 2015).

Many empirical studies show that customer satisfaction is the key to profitability (Eklof, Podkorytova, & Malova, 2018; Pooser & Browne, 2018). Industries focus on customer satisfaction because governments rely on documented harm to determine the extent of customer satisfaction (Oliver, 2015). Many laws are the consequence of attendant costs; hence, satisfaction with entire industries is required to reduce the need for regulatory policies (Oliver, 2015). Customer satisfaction also affects life satisfaction (Altinay et al., 2019; Chen, Huang, & Petrick, 2016).

Two fundamental concepts help define customer satisfaction: transaction-based satisfaction and cumulative satisfaction. The former is based on a specific purchasing evaluation (for instance, when a purchase follows a customer's product selection). The latter is an experience-based evaluation of the product or service purchased and used over a particular period (Anderson, Fornell, & Lehmann, 1994).

In the past, the conceptualisation of customer satisfaction was based on the post-consumption evaluation of the offerings of brands or companies and mostly depended on perceived quality, value, and expectations (Anderson, 1994). However, recently, several authors have begun arguing that the key brand-experience outcome is customer satisfaction (Chahal & Dutta, 2015). Meyer and Schwager (2007)

conceptualise that customer satisfaction derives from retained customer experiences with a brand. Lin (2015) proposes that customer satisfaction relates to the experiences of an individual customer which can be the emotional or psychological consequence. However, White and Yu (2005) argue that the sentimental reaction of the customer towards a brand experience is the customer satisfaction.

Satisfaction has been considered (i) a cognitive state, (ii) a state influenced by former cognition, and (iii) a qualified-character state, as a result of the comparison between subjective experience and former reference-based experience (Oliver, 1980; Oliver & DeSarbo, 1988). However, from the research, it is recognised that to evaluate satisfaction, only a cognitive approach may be insufficient, and it is suggested that perceiving satisfaction from a more affective perspective with cognitive dimensions considering is needed (Oliver, Rust, & Varki, 1997; Phillips & Baumgartner, 2002).

Various tools, processes, and ideas aim to improve customer satisfaction, such as the balanced scorecard (Bazrkar, Iranzadeh, & Feghhi Farahmand, 2017; Olson & Slater, 2002), information technology (McAfee & Brynjolfsson, 2008; Mithas, Krishnan, & Fornell, 2016), employee branding (Hamidizadeh & Sanavi Fard, 2016; Miles & Mangold, 2005), and innovation processes (Cichosz et al., 2017)

The prestigious Malcolm Baldrige National Quality Award recognises the role of customer satisfaction as a fundamental awarding-process component (Dutka, 1993). Customer satisfaction increases profitability; for instance, when satisfied, customers typically share their experience with nine to ten people. Informal communication via word-of-mouth is estimated to affect nearly half of American businesses (Reck, 1991). Improving customer intention by only a few percentage points may increase profits by twenty-five per cent or more (Griffin, 1995). Thus, to increase prosperity, the business world should realise the crucial role of customer satisfaction and appreciate its functional and operational significance (Ilieska, 2013).

Businesses should retrieve customers' feedback and use it to improve and manage operations (Ofir & Simonson, 2001). Customer satisfaction is thought to be the best indicator of the forward-looking view of a business. Moreover, customer satisfaction helps conduct SWOT analysis for systematic business development, thus facilitating decision-making regarding the appropriate resource selection for product

manufacturing. Customer satisfaction also helps preserve the relationship with existing customers and acquire potential customers (Khadka & Maharjan, 2017).

Customers expect satisfaction and seek quality rather than quantity when purchasing products or services. Since various similar products are often available, customers may find it hard to distinguish durable products and correctly assess their quality. Hence, businesses should plan marketing efforts based on the complete understanding of the customers' needs. Customer satisfaction is a key indicator of organisational success (Kotler & Keller, 2006). However, customers have different tastes and choices; hence, satisfaction differs across individuals. The different expectations of customers may also depend on their choices—for instance, they may vary in the domestic or the international market (Kotler & Keller, 2006).

The customer-satisfaction assessment process addresses the international market and targets international requirements. Customer satisfaction radically changes depending on physical and technological elements; however, no comprehensive approach for measuring customer satisfaction is available yet. Customer feedback is often adopted as a decisive tool for customer-satisfaction measurement. However, retaining existing customers is cheaper than acquiring new ones. Large resources are invested in marketing to convince customers of product excellence. Companies consider customer satisfaction their main goal since satisfaction ensures customers' intention to repurchase the products and services. Moreover, satisfied customers often suggest the products to their families and friends, boosting business growth and positively affecting a company's profitability. On the contrary, dissatisfied customers may decrease a company's revenue (Khadka & Maharjan, 2017).

Ultimately, customers determine the success or the failure of a product in the market. An organisation will greatly benefit from the introduction of a product that meets the expectations of its customers. However, if the product fails to match the expectations of customers, the organisation will suffer heavy loss. For example, iPhones entered the market at the beginning of the twenty-first century, exceeding the expectations of customers. Apple Inc. became the number-one technology company in the world mainly because of the iPhone. Today, people all over the world are eagerly waiting for electronic gadgets from Apple because of the expectations that customer satisfaction created with the 'I' series products. Nokia, once the leader of the mobile-

phone industry, is currently struggling for existence. Its inability to develop competitive smartphone products has caused the company's downfall. Customers perceive the availability of better smartphones than Nokia on the market. In particular, Nokia lack any breakthrough or unique features. The case of Nokia suggests that organisations need to focus on the antecedents and consequences of customer satisfaction and develop suitable strategies for attracting customers to survive in the market.

Anderson and Sullivan (1993) conducted a survey of 22,300 customers in Sweden between 1989 and 1990 to investigate the antecedents and consequences of customer satisfaction. Their findings define customer satisfaction as a function of perceived quality and disconfirmation. In other words, customers have some expectations regarding the product they are going to buy. If the product fails to meet the pre-purchase expectations, customers are dissatisfied. Many companies avoid creating expectations for their products before their market launch. As a result, customers will be extremely satisfied if the product performs well, spreading positive word-of-mouth, with substantial benefits for the company. However, imagine the case in which a company excessively focuses on publicity before introducing a product, producing great expectations in the customers' minds. If the product fails to perform as expected, the likely outcome will be customer dissatisfaction.

The determinants of customer satisfaction in the case of online and offline purchases are slightly different. The price of the online purchase plays a significant role in developing customer satisfaction, while product quality plays a prominent role in developing customer satisfaction in the offline purchase experience (Hult et al., 2019). Moreover, customer satisfaction heavily depends on demographics, such as gender (Karatepe, 2011).

Customer satisfaction is related to a customer's attitude (Woodside, Frey, & Daly, 1989). The customer's response to products can be measured by both attitude and satisfaction (LaTour & Peat, 1979). Oliver (1981) emphasises the conceptual difference between satisfaction and attitude since the former results from some product-acquisition characteristics or consumption-experience evaluation. Further, Westbrook and Oliver (1981) argue that satisfaction is an evaluation of the whole purchasing situation as it relates to the customer's expectations, while attitude is a preference for a product regardless of the comparison with other elements. Research finds that attracting

new customers is five times more expensive, also in terms of time and resources, than retaining existing customers (Pizam, Shapoval, & Ellis, 2016) and, normally, customer satisfaction is a significant determinant of customer loyalty (Eggert & Ulaga, 2002) and repurchasing intention (Liao, Palvia, & Chen, 2009).

Based on the discussion about the importance of customer satisfaction in marketing, it can be concluded with major evidence that customer satisfaction is an affective state and gender is one of the factors that plays a major roles in customer satisfaction. The next section will explain the concept of cognitive bias. This research selects the cognitive bias concept based on the work of Daniel Kahneman who was awarded the 2012 Laureates in Sveriges Riksbank prize in economic sciences in memory of Alfred Nobel.

Kahneman (2012) proposes that the dual-system model of human thinking recognises two cognitive processes. The type-1 system is automatic, quick, frequent, stereotypic, emotional, and nonconscious, while the type-2 system is the opposite– slow, logical, infrequent, effortful, controlled, calculating, and conscious (Kahneman, 2012; Stanovich & West, 2000). Recently, economists have begun addressing the relationship between these two cognitive processes in decision-making. For instance, Kahneman (2012) divides cognitive bias into three groups, namely, heuristics, overconfidence, and choice bias.

'Heuristic' is a Greek word that means 'to discover'. The heuristic approach offers a restricted number of signals and/or choices to scrutinise for solving problems in decision-making, in which personal experience is taken into account. Heuristics reduce information retrieving and storing, streamlining the process in decision-making and memory, reducing the amount of information integration needed to choose among alternatives or pass judgement. A company can accelerate its processes of decision-making and problem-solving using the heuristic approach; however, this approach may generate biased judgements and errors (Dale, 2015).

The second type of cognitive bias identified by Kahneman (2012) is overconfidence, a mental phenomenon that leads people to think that they have ample knowledge and understanding of the world. Overconfidence prevents people from considering the role of chance or natural occurrence in certain incidents. For example, the present weather-forecasting technology is highly advanced and can predict the

occurrence of floods and hurricanes. However, in plenty of instances, these technologies fail to predict disasters. In other words, overconfidence in the abilities of advanced technologies may prevent researchers from identifying naturally occurring catastrophic events.

Choices are the third cognitive bias identified by Kahneman (2012). People make logical assumptions based on their available choices and are, on average, keener on averting losses than achieving a gain. Imagine a case in which Person A has a chance to win $1,000 by spending $100, and Person B has the same chance to win $1,000 by spending $10. In the above scenario, Person B is more likely to accept the bet than Person A since he/she needs to invest fewer resources for achieving the gain. At the same time, the possibility that Person A accepts the bet, and Person B rejects it, cannot be ruled out. The acceptance and rejection of the offer are purely based on their choices.

The relevant literature on cognitive bias and satisfaction can be summarised as follows.

With regard to the relationship between cognitive bias and life satisfaction, Cummins and Nistico (2002) propose that positive cognitive bias pertaining to oneself controls people's well-being homeostasis, especially positive bias in relation to self-esteem, control, and optimism. In addition, Wu, Tsai, and Chen (2009) empirically show that self-enhancement, 'have-want' discrepancy, and shifting tendencies mediate between positive cognitive bias (i.e., the sense of control, optimism, and self-esteem) and life satisfaction.

Regarding the relationship between cognitive bias and body satisfaction, Rodgers and Dubois (2016) show the existence of bias related to individual attention to body-image-related stimuli. In particular, they find higher levels of body dissatisfaction in those with lower levels of concern. Evidence exists of judgement and memory bias, and these elements are believed to manipulate body-image-related cognitive bias and body-dissatisfaction levels. Attentional bias is the tendency of recurring thoughts in the moment, with the potential to influence people's perceptions (Bar-Haim et al., 2007).

Furthermore, some studies address the relationship between search-user satisfaction and cognitive bias. Liu et al. (2019) investigate the cognitive effects on session-level search-user satisfaction and find that different cognitive effects, such as the primacy effect, anchoring effect, expectation effect, and recency effect, influence

user satisfaction. The primacy effect is the influence that leads to better subjective primary-information recall compared to the subsequent presentation of information (Coluccia, Gamboz, & Brandimonte, 2011).

Regarding group satisfaction, Stettinger et al. (2015) investigate the anchoring effect and group decision-making and find that the anchoring effect can increase satisfaction among group members through various aspects of the group decision process.

Some studies focus on satisfaction and cognitive bias in the context of the financial industry. For example, Sahi (2017) proposes eight hypotheses regarding the positive relationship between cognitive bias and financial satisfaction. The eight hypotheses included bias from overconfidence, expert reliance, categorisation tendency, adaptive tendency, budgeting tendency, socially responsible investment, the influence of spouse, and self-control. The study finds that bias from overconfidence, self-control, and budgeting tendency is linked to financial satisfaction. Sadiq et al. (2018) find similar results for overconfidence and categorisation tendency, but they show that behavioural bias has the most positive influence on investors' financial satisfaction. Experts' reliance, self-control bias, and adaptive and budgeting tendencies, all expressions of behavioural bias, have no significant influence on investors' financial satisfaction.

With respect to research on cognitive bias and customer satisfaction, Bendapudi and Leone (2003) explore the influence of self-serving bias on customer satisfaction. A company that does not behave in line with the self-serving bias may lead to differences in customer satisfaction with the company, depending on the products that the customers experience. Furthermore, Trudel, Murray and Cotte (2012) investigate conservative bias, one's insufficient belief-revising tendency, and present new evidence regarding its relationship with customer satisfaction. The regulatory focus on consumers has a direct impact on conservative-bias-based satisfaction among customers focusing on prevention. Compared to promotion-focused consumers, prevention-focused individuals tend to protect against making an error, reflecting conservative bias in their satisfaction assessment.

1.2 Statement of problems

Cognitive bias is the result of cognitive elements, customer satisfaction is the consequence of affective components, and the theory of mind recognises the cognitive theory of mind as its precondition (Shamay-Tsoory et al., 2010). Thus, cognitive bias is thought to have a significant relationship with customer satisfaction. In addition, customer satisfaction can occur in three stages of the customer journey: pre-purchase, purchase, and post-purchase. Cognitive bias comprises three aspects: heuristics, overconfidence, and choice. It can match the anchoring effect (heuristics) with the pre-purchase stage, the illusion of control (overconfidence) with the purchase stage, and the endowment effect (choice) with the post-purchase stage.

Hyde and McKinley (1997) argue that a difference exists between female and male individuals in some cognitive abilities. Tanck et al. (2019) find gender differences in the affective state. In addition, Adenzato et al. (2017) use the theory of mind to explain why females score higher in tests of the affective dimension when stimulated by cognition. This result suggests that females exert a greater moderating effect in the relationship between cognitive bias and customer satisfaction.

Moreover, McCann (2006) argue that more than one facet of cognitive bias is regularly at play. Hoven, Amsel, and Tyano (2019) also contend that more than one aspect of cognitive bias can occur in a situation; hence, overcoming bias may be particularly hard when various distortions occur in the same direction.

Although customer satisfaction can be explained by traditional concepts such as perceived quality, value, expectations (Anderson, 1994), and brand (Chahal & Dutta, 2015; Meyer & Schwager, 2007), adding cognitive biases into the study can give more explanation of customer satisfaction. This is because of the fact that people are irrational in decision making (Dowding & Taylor, 2020), thus cognitive biases might play an important role on customer satisfaction.

From literature review, it is very rare to find studies (if any) related to the simultaneous impact of various types of bias affecting customer satisfaction. This study is among the first to empirically test the effects of cognitive bias, namely, the anchoring effect, the illusion of control, and the endowment effect, on customer satisfaction. Many studies address the impact of cognitive bias on satisfaction by testing each effect

separately. In contrast, this study empirically tests various effects of cognitive bias simultaneously.

1.3 Research questions and objectives

As mentioned above, it can be summarised based on prior research that customer satisfaction can be explained by traditional concepts such as brand, perceived quality, value, and expectations. However, to clearly explain customer satisfaction, cognitive biases should be considered as antecedent of customer satisfaction. From literature review, it is found that the theory of mind can be used to explain the relationship between cognitive biases and customer satisfaction. In this theory, the cognitive stage (cognitive biases) acts as its precondition of the affective stage (customer satisfaction).

The main purpose of this research is to expand the body of knowledge regarding cognitive biases and customer satisfaction. This study focuses on using the theory of mind to explain this relationship in marketing context. This study is also test cognitive biases simultaneously.

As a result, the main research questions in this study are

1. Do cognitive biases affect customer satisfaction?

This research questions will help clarify cognitive biases as one of factors that can affect customer satisfaction. In theory, cognitive state can affect affective state. In this research, cognitive bias is representative of cognitive state and customer satisfaction is representative of affective state. The result of this question can confirm the theory. In practice, marketers can answer or clarify a doubt about why customers are not satisfied even when the firms have high quality products. This might be a result of one's cognitive bias.

2. Does gender moderate the relationship between cognitive biases and customer satisfaction?

This research questions will investigate the moderating effect of gender on the relationship between cognitive biases and customer satisfaction. From theory, gender can moderate the relationship between cognitive biases and customer satisfaction. If the answer to this question is in line with the posed question, it can

confirm theory to a certain extent. In addition, marketers can use this finding to increase awareness when conducting marketing campaign with cognitive biases. For example, if it is found that being female has higher effect than male on the relationship between cognitive biases and customer satisfaction, a marketing campaign with cognitive biases should more emphasize on female-focused products/services.

3. Do interaction between cognitive biases affect customer satisfaction?

Since prior researches mentioned that more than one cognitive bias can occur simultaneously, but it lacks empirical support on the relationship between cognitive biases and customer satisfaction. In addition, this can broaden the existing knowledge if the effect of multiple cognitive biases are tested simultaneously. For the practical perspective, marketers can use this finding to improve their marketing campaign. Only one cognitive bias might not be sufficient to attract their customers. Thus, adding more than one cognitive bias can increase customer satisfaction.

Based on these research questions, the two main objectives of this research are proposed as follows:

1. To expand the boundary of knowledge in the theory of mind. This theory of mind can be used to explain the phenomena of customer satisfaction with some proper adjustment.

2. To propose the managerial implications to practitioners to take into account of the effect of the cognitive biases when dealing with customer satisfaction.

1.4 Scope of research

The research focuses on the consumer product. The reason for selecting pen as an object in this study comes from the study of Dempsey and Mitchell (2010), which mentioned that pen is product category people are acquainted with. It is also considered to be utilitarian and functional product. Therefore, the participants would not typically use their emotions when making a choice.

This study only focuses on three types of cognitive biases proposed by Kahneman (2012). These three types are heuristics, overconfidence, and choice. This research is selected anchoring effect as representative of heuristics, the illusion of control as representative of overconfidence, and the endowment effect as representative of choice.

The methodology used in this research is experimental research. This study uses a between-subject design. The scenario is differentiated by the different aspects of cognitive bias producing 2 x 2 x 2 = eight scenarios which each scenario is employed more than 60 participants per scenario (about 30 males and 30 females).

1.5 Research contribution

The research contributions consist of both theoretical and managerial contributions.

In term of the theoretical contribution, since prior researches rarely investigate the relationship between cognitive bias and customer satisfaction, the result of this research can be used to solve the puzzle of explaining customer satisfaction. Although cognitive biases and customer satisfaction play a major role in marketing field, it lacks the study of the relationship between two concepts in prior research. This research uses the theory of mind to explain the linkage between cognitive biases and customer satisfaction and if this can be done, it will enhance the usage of this theory.

Although the theory of mind is a well-accepted theory, its effect is expected to be different when gender is different. This study is trying to investigate whether there is a different effect of gender on customer satisfaction. In the previous research, it is mentioned that females score higher in tests of the affective dimension when stimulated by cognition. To confirm or challenge this statement, moderation effect of gender on the relationship between cognitive bias (anchoring effect, illusion of control, and endowment effect) and customer satisfaction is tested.

This study also challenges the existing theory as it argues that the interaction of cognitive biases can play a major role on customer satisfaction. This statement currently lacks of empirical study; hence, this is an issue that this study will

investigate. Understanding this issue can eventually expand the body of knowledge in the theory of mind

Additionally, testing the effect of cognitive biases on customer satisfaction simultaneously broadens the existing knowledge as this might enhance the capabilities of the theory of mind when used to describe the customer satisfaction.

For practical contribution, marketers can use the findings for managerial contribution by improving their marketing strategy. First, marketers can use anchoring effect to influence buyer decisions in various ways (e.g., original price and discount, monthly and annual plans, manipulating price perception, leading with core selling point, and gear-acquisition syndrome). Marketers also form an impression that customers are in control of any transaction which would help reduce the negative sentiments linked to lack of certitude and loss of control. For instance, positive sentiments would arise if an organisation allows customers to make choices or apply filters that allow controlling the searching phase of the purchase, making it evident in all decision-making phases. The more control over particular elements the organisation allows its customers, the more the organisation generates a positive perception of control and promotes adaptation.

In addition, marketers can use endowment bias to boost marketing campaign strategies, such as giveaways, free trials, accounts and personalisation, premium versions, adding new features for premium customers, and brand ownership. Marketers might use all these strategies to increase product sales or campaigns. As soon as endowment effect occurs, people assign value to perceived ownership, allowing the organisation to move them along the conversion process.

Since gender is an essential demographic factor, knowledge about gender differences will help marketers to better respond to each gender segment. Finally, marketers can manipulate one or more of such aspects to increase their customers' satisfaction. In other words, they might use cognitive bias as a strategic tool for achieving profitability.

1.6 Structure of the research

This dissertation is divided into six chapters.

Chapter one introduces the origination and overview of this research. This chapter starts with the background of this research. After that, statement of the problem, the research questions and objectives, scope of research, and research contribution are described and discussed.

Chapter two is literature review part. Concept, literature, and prior research in customer satisfaction, cognitive biases, and Theory of Mind are presented. In addition, concept, literature, and prior research in anchoring effect, illusion of control, and endowment effect is also submitted. Overall, this chapter discusses the originality of the study through an up-to-date literature in relevant research topic.

Chapter three is about hypotheses development. From introduction and literature review part, it can propose conceptual framework and hypotheses. In this research, it proposes ten hypotheses. In this research, there are three main hypotheses consisting of the relationships between cognitive biases and customer satisfaction, there are moderation effect of gender between relationship between cognitive biases and customer satisfaction, and there are interaction effect of the cognitive biases in the relationship with customer satisfaction.

Chapter four is research methodology part. This chapter explains the methodology for hypotheses testing which is the answer to the research questions. The parts in this chapter consist of research design and procedure, participants and design, experimental procedure, manipulation check, and statistical method.

Chapter five describes and discusses the results of the study. This chapter presents descriptive statistics and manipulation check results from this study's experimental design. It also produces hypotheses testing results from ten hypotheses formulated in chapter two.

Chapter six provides the conclusion of this research. This chapter starts with the findings of each hypothesis. Next, theoretical contributions and managerial implications are explained. At the end of the chapter, limitations and opportunities for further researches are presented.

CHAPTER 2
REVIEW OF LITERATURE

The framework of the literature review includes the following topics:

1) Customer satisfaction
2) Theory of mind
3) Cognitive bias
4) Anchoring effect
5) Illusion of control
6) Endowment effect

2.1 Customer satisfaction

For marketing, customer satisfaction is the most popular terms due to its significant effect on business outcomes: positive and negative genres. (Gonzalez, Comesana, & Brea, 2007). Firstly appearing in English since the thirteenth century, the word 'satisfaction' is derived from Latin words - *satis* (meaning 'enough') and the *'faction'* from the Latin *'facere'* (meaning 'to do or make') (Aigbavboa & Thwala, 2013). The construction of satisfaction has been used to interpret human nature in various circumstances. In consequence, research on customer satisfaction in other fields such as economics, sociology, psychology and health has been in the interest among researchers (Tse & Wilton, 1985). Industrial psychologists have built a body of work on job/worker satisfaction, starting from the dispositional approach (Munsterberg, 1913) and progressing to Maslow's hierarchy of needs (Maslow, 1943), Herzberg's motivation-hygiene theory (Herzberg, 1959), and the job-characteristics model (Hackman & Oldham, 1975). The study of satisfaction grew rapidly in the 1970s. Satisfaction has been fundamental for marketing for over five decades, and its most extensive use relates to studies focusing on customer satisfaction (Aigbavboa & Thwala, 2013).

2.1.1 The definition of customer satisfaction

A response to an evaluation process is a definition of satisfaction (Fornell, 1992; Oliver, 1980). To be more specific, satisfaction is seen as the customer value assessment result after the shopping process (Cronin, Brady, & Hult, 2000). In other words, if the customer norms and expectations can be met, customers are satisfied (Zeithaml, Berry, & Parasuraman, 1996).

Oliver (1997) defines satisfaction as 'everybody knew the meaning of satisfaction until they were asked what definition of satisfaction was'. However, researchers agree on some definitions. For instance, Customer satisfaction as defined by Howard and Sheth (1969) is the cognitive state of 'the buyer in being adequately or inadequately rewarded from their undergone sacrifice'. This is also defined by Westbrook (1980) as the subjective favorability evaluation from the experiences and number of outcomes related to the consumption or usage.

Satisfaction is defined by Tse and Wilton (1988) as the reaction of consumer when one perceived on the discrepancy assessing between pre- expectations (or some performance norm) and the actual products performance post to the consumption. Engel and Blackwell (1982) consider on satisfaction as 'an evaluation on the selected alternative that is consistent with their beliefs in the respect alternative before use' where this term is defined as the consumer's fulfilment response by Oliver (1994). Also, it can be referred to as the judgment on the features of product or service, or the product or service itself that offers the pleasurable level as the consumption-related fulfilment. This has also included the under- or over-fulfilment levels.

According to Fornell et al. (1996), satisfaction is the overall evaluation based on the experiences on consumption, and the total purchasing of product or service'. It is argued by Oh and Parks (1996) on the complexity of human process concerning an 'extensive cognitive, affective and other undiscovered physiological and psychological dynamics'. Lastly satisfaction is defined by Kotler, and Keller (2012) as the pleasure or disappointment feeling of a person as a result of the comparison between the perceived on product's performance and the outcome against their own expectations'.

2.1.2 Evolution of customer satisfaction

The evolution of customer satisfaction has been affected by the cognitive dissonance theory, contrast theory, expectancy-disconfirmation theory, the importance-performance model, comparison-level theory, value-percept theory, attribution theory, the evaluative-congruity model, and the equity model.

The early research studies on customer satisfaction conducted by Howard and Sheth (1969) and Cardozzo (1965), the dissonance theory proposed by Festinger (1957) were based on. Festinger (1957) proposed the dissonance theory in which it held that rating gave after the products were primarily an expectation level functioning since the recognizing disconfirmation was believed to be the psychologically uncomfortable task. Consumers are then posited to the perceptually distort of expectation-discrepant performance in accordance with their previous expectation level' (Oliver, 1977). To be said also, this is the theory based on the cognition and reality dissonance. Perceived dissonance would change the particular cognitive perceiving by someone (Bhattacherjee & Premkumar, 2004). As suggested by Cardozzo (1965) those who expected for object with high-value but received the product at low-value would recognize the disparity and understanding on cognitive dissonance. In other words, dissonance theory investigates the match between a person's expectation of an object or performance and his/her experience in the real world (Elkhani & Bakri, 2012). This theory suggests that an organisation should avoid raising expectations to obtain a higher level of customer satisfaction (Yi, 1990). The full explanation for consumer satisfaction has not been given in Dissonance theory but, it has indicated about non static expectations that could be shifted according the consumption experience (Danaher & Arweiler, 1996).

Contrast theory however presents with the opposite results. Based on this theory, if consumer's expectation fails from the product performance, the contrast between the outcome and consumer expectation may induce on disparity exaggeration by consumer. (Cardozo, 1965; Engel & Blackwell, 1982; Howard & Sheth, 1969). In other words, if a product performs below expectations, the consumer will rate it more poorly than the reality suggests (Oliver & DeSarbo, 1988). Contrast theory contends that subject would give favorably or unfavorably response to the disconfirmation experience as a consequence that their experiences are deviated from expectations; where it is believed that the negative disconfirmation would lead to the poor evaluation

of product and the positive disconfirmation shall lead the product to get highly appraised' (Oliver, 1977). Many empirical studies test this effect, such as Anderson (1973), Olshavsky and Miller (1972), and Cardozzo (1965).

Considering drawbacks of the consumer satisfaction theories in the early period, Oliver (1997, 1998) introduces the encouraging theoretical framework for customer satisfaction assessment, so-called Expectancy-Disconfirmation Paradigm (EDP). The model indicates that customers purchase goods and services by having anticipation prior their purchases. Whenever consumers have expectations and the results match their expectations, they receive confirmation. However, if the outcomes are below expectations, they experience disconfirmation. Satisfaction is experienced when the outcomes exceed expectations. In contrast, if the outcomes are below expectation, dissatisfaction is experienced. Several studies empirically test this effect, i.e., Tribe and Snaith (1998), Pizam and Milman (1993), Barsky and Labagh (1992), Barsky (1992), Oliver and Swan (1989), Tse and Wilton (1989), Oliver and DeSarbo (1988), Churchill and Surprenant (1982), and Oliver (1980).

Besides value, importance and performance also contribute to explaining satisfaction. Martilla and James (1977) propose the importance-performance model, which explains customer satisfaction as a function of the importance of attributes and the perception of performance. This approach is closely related to the expectancy-value model of Fishbein and Ajzen (1975), which contend that customers rank products based on their characteristics. In this model, performance represents the user's perception of the quality of the services delivered by the organisation, while importance refers to the users' assessment of the importance of those services. Many industries use this model, such as tourism (Hudson, Hudson, & Miller, 2004), traffic and transportation (Chen & Chang, 2005), education (Nale et al., 2000), manufacturing (Matzler et al., 2004), and services (Joseph et al., 2005).

Not many studies contradict the expectancy-disconfirmation theory which its approach sets the primary determinant of customer satisfaction as the predictive expectations from manufacturers, reports or unspecified sources (Yi, 1990). LaTour and Peat (1979) contend that the expectancy-disconfirmation theory does not identify other sources of expectations. They modify the comparison-level theory of Thibaut and Kelley (1959), which concludes that expectations also depend on

consumers' prior experiences with similar products, situationally produced expectations, such as advertising and promotion, and the experience of reference people. Thus, from the perspective of the comparison-level theory, consumers consider other comparison standards, both before and after purchase.

The value-percept disparity theory as originally proposed by Locke (1967) is applied by Westbrook and Reilly (1983) to reflect the incapable to fully explain on the satisfaction of consumers by the expectancy-disconfirmation theory. Desire and value could either be or not to be related to some associated with expectations since satisfaction is a cognitive evaluation process to trigger an emotional response where perception on an offer can compare with one's values, desires and needs. Alone, the expectations cannot give explanation on customer satisfaction. It is found by Westbrook and Reilly (1983) that both expectations and values must be adopted to address on customer satisfaction.

Attribution theory is an alternative way to explain satisfaction based on Weiner et al. (1971), mostly used in dissatisfaction models (Folkes, 1984). Bitner (1990) argues that when products or services delivered to consumers do not match expectations, generating dissatisfaction, people may find reasons to justify the mismatch. Pearce and Moscardo (1984) explain that people look for causes along three dimensions: locus of causality, stability, and controllability. If the causes of the mismatch occur with no clear responsibility, people attribute the mistakes to the surrounding environment. However, if a company is responsible for the mistakes, customers tend to think that it is the firm's doing (Folkes, 1984). Moreover, if the response to the problems is not sufficient, people will likely spread negative word-of-mouth to show their dissatisfaction (Richins, 1985).

Sirgy (1984) proposes that customer satisfaction is a function of evaluative congruity, in line with the congruity theory (Osgood & Tannenbaum, 1955). This approach is close to the confirmation/disconfirmation concept. Congruity theory is defined using three states of congruity: negative incongruity, congruity, and positive incongruity. Congruity is based on perception and cognition. If perception exceeds cognition, positive incongruity occurs, leading to satisfaction. However, if perception falls short of cognition, negative incongruity occurs, leading to dissatisfaction. In addition, Sirgy (1984) implies that congruity can take place in various states, such as

the perception on production performance during the use or post to the perception of product performance (after-use perceived performance) t, and the expecting of product performance prior to use it. During the perceived performance of new product after-use and the perceived performance from an old product as well as between the expected on product performances post to the purchase and expected on product performance prior to purchasing. Moreover, customer satisfaction is explaining in Sirgy (1984) not only as the consumer's expectations and product performance assessment, however as the consumer's product image (functional congruity) and self-image (symbolic congruity) evaluation.

An alternative model to explain customer satisfaction is adapted from equity theory (Adams, 1963) and contends that people perceive satisfaction when the output matches the input or is, at least, acceptable given the input (Swan & Oliver, 1989). The input and output depend on many factors, such as the price, benefits gained, time invested, and experience with past transactions. The comparison is also affected by the gains of other people who experience the same products or services (Meyer & Westerbarkey, 1996). Fisk and Coney (1982) find that people have less positive attitudes towards and are less satisfied with products or services if other people gain more output than they did.

2.1.3 Measuring customer satisfaction

Research on customer satisfaction suggests that organisations should be aware of their own strengths and weaknesses (Devlin, Dong, & Brown, 1993). This awareness may help them create customer value by meeting customers' needs rather than relying on assumptions about their desires (Keuc, 2014).

Customer satisfaction is a latent variable and cannot be observed directly. Hence, proxy variables are necessary to perform an indirect analysis (Battisti, Nicolini, & Salini, 2010). For instance, Oskamp (1991) notes the importance of removing ambiguity in the wording of questions, which might affect the accuracy of surveys. Reichheld (2003) contends that long sets of questions should not be used as they increase cost in terms of both time and money and sometimes introduce irrelevant variables. Several techniques exist to measure customer satisfaction, from the most traditional to the most innovative.

However, no consensus has been reached in the literature, with traditional and contemporary methods suggesting different approaches, different scales, and the use of single or multiple items. The creation and use of scales to measure the value of services appears to lack planning and is often time-consuming, leading to the need for further investigation (Gilmore & McMullan, 2009). Churchill (1979) explains that while many marketers have an interest in data regarding their service quality, they often lack the necessary skills to obtain such information. Moreover, Jacoby (1978) observes that the poor quality of some marketing studies results from the poor choice of variables that researchers use as value measures. Very few studies have been effective in determining the validity of the proposed value measures (Gilmore & McMullan, 2009).

Two different types of item scales have been used in the literature: the single-item scale and the multiple-item scale. The former uses one item to measure one construct, whereas the latter employs more than one item for measuring a single construct (Danaher & Haddrell, 1996; Keuc, 2014).

The advantage of the single-item scale is that it is quick and easy to use (Loo, 2002; Nagy, 2002). It can range from two to nine measuring points, allowing respondents to choose which end of the scale matches their opinion (Danaher & Haddrell, 1996). The most common scale for researchers to use, including Nagy (2002) and Keuc (2014), is the five-point Likert scale. Other well-known studies apply a seven-point scale ranging from strong agreement to strong disagreement (Gounaris, 2005; Parasuraman, Zeithaml, & Berry, 1988) or even a ten-point scale ranging from extremely good to extremely poor (Bolton, 1998; Parasuraman, Berry, & Zeithaml, 1991; Rust, Zahorik, & Keiningham, 1995).

While these scales are relatively simple, Diamantopoulos et al. (2012) recommend applying them with care and relying upon these scales only for exceptional situations. Yi (1990) also argues that the use of such scales adds complexity and makes it difficult to achieve reliable estimates. Furthermore, information on the constituent components is not always provided, and the various dimensions are evaluated separately. Therefore, these scales may not correctly identify all the relevant factors associated with customer satisfaction.

Churchill (1979) advocates the use of the multiple-item scale, suggesting that the uniqueness of the single-item scale leads each item to show a weaker relationship with the feature under evaluation. Furthermore, single-item scales are less reliable due to higher likelihood of measurement errors. Churchill (1979) implies that the shortcomings of the single-item scale can be resolved by using multiple items, which solve the problem of uniqueness. This approach improves reliability as respondents are more easily categorised, and a reduction is observed in the potential for measurement errors.

The most widely accepted measurements of customer satisfaction have been introduced by Fornell et al. (1996) and Fornell (1992). They contend that the measurement of customer satisfaction should involve three components. The first is overall satisfaction. The second is whether expectations have been. The third is that performance should be compared to the customer's ideal concept of the product or service. Many previous studies rely on these concepts, such as Atulkar and Kesari (2017), Rego, Morgan, and Fornell (2013), Fornell et al., (2006), Anderson, Fornell, and Mazvancheryl (2004), and Anderson, Fornell, and Lehmann (1994).

2.1.4 The importance of customer satisfaction

From the consumer's perspective, customer satisfaction is the final stage of consumption, signalling either that the next decision needs improvement or a bad decision has consequences. From the firm's perspective, customer satisfaction is the antecedent of customer loyalty and its financial impact (Oliver, 1997). The role of customer satisfaction have been mentioned by Dick and Basu (1994) on the loyalty, where it is greatly indicated that satisfaction is the major determinant for loyalty. Thus, the link between customer loyalty and customer satisfaction can be noticed. Both concepts shall be mutually incorporated for the company to achieve the goal as desired where here it refers to the market share and profitability

This section explained and discussed customer satisfaction, including its definition, measurement, and importance. In conclusion, customer satisfaction is an affective aspect. The next subsection will address the theory of mind and the relationship between cognitive and affective aspects.

2.2 Theory of Mind: The relationship between cognitive and affective aspects

In the late 1970s, the term 'Theory of Mind' firstly appeared in a seminal article proposed by Premack and Woodruff (1978), primatologists who claim that capability of inferring the mental states of self and others among is found in chimpanzees and their same species. From 1980 to 2000, behavioral symptoms in autistic spectrum disorders were explained by the concept of 'Theory of Mind' (Baron-Cohen, Leslie, & Frith, 1985). Nowadays, the theory is known as the ability to identify the mental states and emotions of others (Fernyhough, 2008)

According to Tsoukalas (2018), the theory of mind is a major development in cognitive neuroscience. It helps humans visualise others as cognisant and intentional beings. The theory of mind allows predicting or explaining the actions of others in particular situations. For example, people usually develop depression when losing loved ones. Hence, the chances of developing depression may be predicted based on the analysis of how deeply a person was attached to the loved one who passed away. Both verbal and nonverbal means of communication help predict the behaviour of others. For example, an angry person usually expresses anger through eye contact or facial expressions. Others can observe the expressions of a person's agitated or disturbed state. Based on such realisations, humans adjust their behaviour while dealing with different people in different occasions and contexts.

Although the theory of mind was acknowledged around half a century ago, its origin is still debated (Tsoukalas, 2018). According to Brüne and Brüne-Cohrs (2006), the evolutionary origin of the theory of mind can be traced back to non-human primates, among whom social interactions are common. This theory is believed to have evolved from non-human primates' adaptive response to social interactions among their peers (Brüne & Brüne-Cohrs, 2006). The primary reason for investigating the evolution of this theory is its growing importance in the modern study of human behaviour and the belief that it has played a significant role in human evolution, similar to language (Baron-Cohen, 1991).

Tsoukalas (2018) hypothesises that the theory of mind originates from two closely related defence mechanisms: tonic immobility and immobilisation stress. While the former is a natural state of paralysis, the latter is a psychological stressor that

develops emotions such as fear and anxiety. Both tonic immobility and immobilisation stress occur in most vertebrate species, especially in immature individuals. These mechanisms are primarily observed in stressful situations (Tsoukalas, 2018).

Various hypotheses exist regarding the purpose of this theory's evolution. Many prominent scholars contend that this theory evolved to cater to the needs of social cognition, which investigates how people respond to information and apply it to real life and social situations. According to Baron-Cohen (1991), the concepts of the theory of mind can be applied even to 7–9 months old infants. Infants of that age seem to be able to recognise the facial expressions of others, thus explaining why they smile and cry after observing different facial expressions. An infant's ability to read the minds of others increases with age. According to Meltzoff and Decety (2003), the theory of mind predicts the imitation of others, helping infants decide whether the physical and mental states of others are similar or equivalent to what they feel (Meltzoff & Decety, 2003).

Infants can infer a broad range of information from the eyes and facial expressions of others. Interpersonal relationships are developed and sustained by individuals' ability to understand each other's emotional, cognitive, and behavioural aspects. The theory of mind is specifically described as the ability of an individual to attribute one's mental states, such as thoughts, beliefs, and intentions, to others. This capacity has developed under different names, such as 'commonsense psychology'. Mental states and the resulting attributions appear in both verbal and nonverbal forms. The theory of mind is expressed in multiple languages, depending on natives' description of mental states, physical feelings, and attitudes, such as desires and beliefs, and the relative emotional states (Pappas et al., 2016). For instance, in social interaction, the involved individuals have various thoughts and beliefs about their own and others' mental states. However, beliefs and thoughts are not always verbalised. Therefore, the resulting relationship between the cognitive and affective dimension indicates that cognitive capacity affects the affective dimension.

As information-processing systems, the affective and the cognitive dimensions strongly affect an individual's emotional response. Notably, the affective system is reactive and does not operate in conscious thought, unlike the cognitive system. Therefore, psychophysiological events result from an automatic response to the information received from the sensory information of the affective system (Bratman et

al., 2015). In contrast, the events of the cognitive processing system are conscious; hence, the sensory information is analysed and may influence and, in some cases, counteract the affective system (Goldman, 2012). The affects that influence and lead to changes in the affective system are either positive or negative. Notably, positive effects have been identified as potentially able to enhance creativity, while negative affects lead to narrow thinking, adversely affecting performance. Consequently, the relationship between cognitive capacity and the affective system is of key importance.

As mentioned above, the cognitive and affective systems work consciously and unconsciously, respectively. Emotions are the determinants of the resulting actions, influenced by changes in the affective system generated by the stimulation of the sensorial information. Thus, the cognitive system interprets the reality of the world, making sense of it (Dennis et al., 2013). The judgemental system, either conscious or unconscious, is referred to as the affect. Emotions appear in the system as the conscious experience of affect (Stangor, Jhangiani, & Tarry, 2017).

The affective system's use of unconscious experiences leads to unanalysed affects. Consequently, the system can generate negative emotions, such as nervousness and stress, which ultimately threaten one's performance levels (Poletti, Enrici, & Adenzato, 2012). However, despite such negative impacts, the affective system distinguishes between 'good' and 'bad'. Notably, the affective system is where the 'fight or flight' response is induced. The affective system keeps an individual alert through instincts used to distinguish between 'good' and 'bad'. When the mind faces a specific situation, self-preservation is possible even when the unconscious mind is involved (Sebastian et al., 2011). Therefore, the ability to attribute one's mental states, even under the influence of affects, reflects the influence of the cognitive system on the affective side.

The cognitive system conducts inference of others' thoughts or beliefs. In the context of social relations, various signals transmit relevant information, such as facial expressions and body motion. However, the signals must be decoded by both implicit and explicit processes that are automatic and immediate, similar to reflexes. Interpersonal relationships, whether social or professional, generate predetermined, known, and expected reactions in each situation (Meinhardt-Injac et al., 2018). One's culture or individual experiences influence one's knowledge. Therefore, an explicit representation of one's thoughts, reactions, and beliefs regarding an individual's mental

state is demanding, reflective, and move at a slow pace. This view represents an integrative approach to the theory of mind that involves both the affective and cognitive systems (Lee & Yun, 2015). In particular, the implicit and explicit processes used in determining the final representation represent the influence of the conscious expression determining the unconscious reaction.

The cognitive and the affective systems are both essential elements in the theory of mind. The positive cognitive dimension has significant implications for the affective system. In particular, it influences decision-making, especially the number of options considered at any time. In addition, the speed of decision-making, especially in finalising the objective, is equally important and influenced by the affective system (Nahl, 2005). The positive cognitive dimension can be used to manipulate the emotional response in a given scenario. For instance, companies use various items to influence a buyer's opinion of a product. Therefore, the analysis conducted in the conscious mind, which results in a cognitive action, leads the reactive nature of the affective system in the unconscious mind to counteract it. Thus, the cognitive dimension significantly affects the affective dimension.

The next section will address one cognitive state, namely, cognitive bias.

2.3 Cognitive bias

The origin of cognitive bias comes from the challenge against rational choice theory. Rational choice theory defines individual actors as antecedent of social behavior. Individual actors, based on their preferences, are assumed to be complete and transitive (Blume & Easley, 2008). This theory has its key idea based on the writings of Adam Smith and has three important assumptions: (1) individuals have selfish preferences, (2) they maximize their own utility, and (3) they act independently based on full information (Wittek, 2013).

However, in 1969, Amos Tversky and Daniel Kahneman challenge rational choice theory by introducing cognitive biases (Gilovich, Griffin, and Kahneman, 2002). In some cognitive biases, there is a theoretical explanation for occurrences such as attribution theory to explain self-serving bias. On the other hand, some cognitive biases have no theory to back up their occurrences.

According to Kahneman (2012), cognitive bias is a mental phenomenon that causes an error in human thinking and decision-making, mostly associated with memory—for example, the way an event stored in the memory can lead towards biased thinking and decision-making. Imagine a case in which a teacher punishes a student for not doing homework. The student may develop a bad impression of the teacher, leading to the student assessing the teacher's future activities in a biased way.

Kahneman (2012) mentions two different systems that help the brain develop thoughts. While system 1 is unconscious, fast, stereotypic, automatic, frequent, and emotional, system 2 is conscious, slow, infrequent, logical, calculating, and effortful (Kahneman, 2012). Some believe that women are inferior to men or men have the upper hand in the world. This is an example of system-1 thinking. The development of sorrow at the time of the death of a loved one is another example of system-1 thinking. In contrast, system-2 thinking forces people to think logically and philosophically. For example, system 2 helps humans judge that the distance from the earth to the moon is less than the distance from the earth to the sun. System-2 thinking helps people decide about the appropriateness of a particular behaviour in a social gathering. On many occasions, two people develop different mental images after witnessing an incident. This phenomenon reflects differences in their thinking process. One person may rely on system-1 thinking, while the other uses system-2 thinking. As mentioned before, Kahneman (2012) identifies three types of cognitive bias: heuristics, overconfidence, and choice bias.

Heuristics forces people to make judgements and decisions based on the most relevant aspects of a complex problem (Lewis, 2008). Both animals and humans make use of heuristics to solve adaptive problems (Gigerenzer & Brighton, 2009). For example, imagine a situation in which a rat finds some food in a certain spot in the kitchen on a particular night. The rat will visit that place the next night, expecting the presence of food. Anticipating this event, one may mix some poison with the food and kill the rat. Kahneman (2012) introduces heuristics to prove the association of new knowledge with existing patterns in a system-1 thinking process. For example, Bin Laden was the chief architect of the 9/11 terrorist attack on America. After this attack, people began accusing Bin Laden of all other terrorist attacks that happened in America and elsewhere. In other words, people developed a biased view of all the activities of

Bin Laden after 9/11. Anticipating this event, some other terrorists or criminals might have used this opportunity to carry out their missions. Heuristic thinking lacks the support of logic and evidence, relying heavily on probabilities and possibilities for making judgements.

Simon (1957) introduces the concept of heuristics, proposing that people strive to make rational choices where human judgement is subject to cognitive restrictions. Only rational decisions will involve factors weighing, for example, the possible costs against the potential benefits. In addition, limited information and time, as well as perception and intelligence, also influence a decision-making process.

Tversky and Kahneman (1974) link heuristics to cognitive bias and identify three heuristics, namely, representativeness, availability, and adjustment and anchoring. When adopting such categories for deciding, for instance, whether a person is a criminal, representativeness plays a key role. An individual instance shows high representativeness for a category when it corresponds to the category prototype. The explanation of probability judgement bias is linked to availability heuristic. People adopt ease of use as an example of a hazard that can form a cue in mind to estimate the probability of hazard (Keller, Siegrist, & Gutscher, 2006). Tversky and Kahneman (1974) describe heuristic anchoring and adjustment as an estimation strategy for unknown quantities, starting from the known information and then adjusting until an acceptable value is reached (Epley & Gilovich, 2005).

Overconfidence bias, is a person's subjective confidence in his/her own judgements, often disregarding the accuracy of those judgements, due to high confidence (Pallier et al., 2002). Moore and Schatz (2017) address three facets of overconfidence bias: (1) Overestimation is a logic by which people self-servingly overestimate the amount or likelihood of desirable outcomes. Examples of overestimation bias include the illusion of control (Sharma & Shakeel, 2015), planning fallacy (Flyvbjerg & Sunstein, 2016), and contrary evidence (Krizan & Windschitl, 2007); (2) Overplacement is the exaggerated belief that one is better than others (Moore & Schatz, 2017), such as bias towards better-than-average effects (Svenson, 1981), comparative-optimism effects (Kruger & Burrus, 2004), and positive illusions (Taylor & Brown, 1988); (3) Overprecision is the excessive faith that people know the truth (Moore & Healy, 2008) and is the strongest type of overconfidence (Haran, Moore, &

Morewedge, 2010). Studies find that confident people have excessive belief in their accuracy– they are characterised by a too narrow an interval of confidence (Soll & Klayman, 2004). The decision-making of a beginner and an expert can equally seek a level of overprecision (McKenzie, Liersch, & Yaniv, 2008).

Finally, choice bias can influence the irrational decisions of people when comparing two or more situations. Adapted from the utility theory, prospect theory can be used to explain this bias (Kahneman & Tversky, 1979). According to Kahneman and Tversky (1979) and Kahneman (2012), prospect theory is a behavioural model of how people select among alternatives that imply both uncertainty and risks. Usually, people weigh the expectation of utility based on a reference point rather than the outright results. Also, prospect theory relies on four major assumptions. First, the evaluation of the risky choices occurs with regard to losses and gains from the reference point. Pope and Schweitzer (2011) support this assumption. Second, individuals are loss averse, with extreme risk aversion regarding minor bets around the reference point. Rabin (2000) finds that people decline to bet on offers with a 60 per cent dollar-winning probability and a 40 per cent probability of losing the dollar, although this result seems to suggest an implausibly high risk aversion. Third, individuals are risk averse in the gain domain and love being at risk in the loss domain. People select a gamble with a 50 per cent chance to lose $1,000 over an outright loss of $500 (Kahneman, 2012). Finally, in assessing lotteries, individuals convert the objective probabilities into decision-making that overweighs low-probability events and underweighs a high-probability events (Kahneman, 2012). Choice bias can be generated by the endowment and framing effects.

In line with Kahneman (2012), this study addresses the anchoring effect, endowment effect, and illusion of control.

2.4 Anchoring effect

The anchoring effect has a significant influence on decision-making. According to Furnham and Boo (2011), humans often rely on heuristics to make choices. However, heuristics can lead to systematic errors referred to as cognitive bias. The anchoring effect is a result of the inability to make correct decisions due to overdependence on a piece of information (McElroy & Dowd, 2007). When asked to estimate certain variables, individuals refer to values that they can remember easily. The anchoring effect is evident in different contexts, including judicial sentencing (Enough & Mussweiler, 2001), medical diagnoses (Saposnik et al., 2016), and negotiations (Dias, Zhao, & Black, 1999). The effect is also common across groups with different levels of proficiency in certain issues, from novices to experts (Orr & Guthrie, 2005).

Mussweiler and Strack (2001) explain the anchoring effect as an outcome of insufficient adjustment. The authors argue that people make estimates using initial values that are often modified to yield the final answer. An anchoring effect occurs when adjustments are inadequate to generate the most accurate values. As a result, distinct starting points for decision-making result in different estimates. The adjustment may be suspended when approaching acceptable values of the estimate. For instance, individuals asked to determine whether the proportion of African nations in the U.N. is lower or higher than 65 per cent may use the anchor value as the starting point for their estimates. Sufficient data can help individuals make correct adjustments to their estimates to reach acceptable conclusions.

The selective-accessibility model describes the causes of the anchoring effect. Strack, Bahnik, and Mussweiler (2016) assert that comparing a target to an anchor value leads to bias when information is used to prove judgement. Usually, individuals gather data consistent with hypotheses about issues addressed by decision-making. The authors indicate that various mechanisms for hypothesis-testing mediate the anchoring effect when making choices. The selective-accessibility model assumes that individuals retrieve relevant information from memory to generate a comparative judgement (Strack, Bahnik, & Mussweiler, 2016). For instance, people who are asked whether the percentage of African states in the U.N. is lower or higher than 65 per cent

appear to have tested the hypothesis that the proportion is 65 per cent before providing answers that deviate from the anchor value. Even if the hypothesis is rejected, selective information search results in inconsistent data gathering for decision-making. The selective-accessibility model indicates that anchor values determine the choices assessed by individuals before making the final decision.

Furnham and Boo (2011) contend that the cognitive-experiential self-theory explains the influence of insufficient adjustment on the anchoring effect. They show that information processing occurs in two systems. The first is rational, analytic, rule-based, and conscious, while the second system corresponds to an experiential model (Furnham & Boo, 2011). Normative-statistical responses are linked to rational thinking, while experiential-intuitive thoughts are associated with heuristic processes. Furnham and Boo (2011) show that personality traits also affect anchoring since those who are open to new experiences and characterised by low extroversion are highly susceptible to an anchoring effect. In contrast, highly conscientious people rely on thorough thought processes to make decisions. Besides, one's mood determines the risk of the anchoring effect. Sad emotions compel humans to engage in effortful information processing, which favours the anchoring effect. Based on the cognitive-experiential self-theory, Furnham and Boo (2011) emphasise that emotionally charged and quick and effortless heuristics characterise the anchoring effect. The cognitive-experiential self-theory indicates that the level of rationality among individuals determines their susceptibility to the anchoring effect.

However, some studies challenge the view that mood affects anchoring for individuals with different skills and capabilities. Englich and Soder (2009) show that emotions influence anchoring among novices making choices in certain areas. Their research shows that experts are susceptible to anchoring regardless of their moods. For instance, managers with high expertise and greater knowledge and experience are expected to show less uncertainty when making decisions. In contrast, the authors show that skills or knowledge do not help people avoid anchoring, even when they are in the right mood. As a result, the authors recognise that the anchoring effect can influence senior managers' decisions on issues such as pricing, negotiation, and marketing. The study suggests that one's mood may not help prevent the anchoring effect when making choices.

In addition, the level of motivation is linked to the anchoring effect. Simmons, LeBoeuf, and Nelson (2010) explain that those individuals who seek to be accurate in their judgments are more likely to adjust their estimates than those with low incentives to make the right choices. As a result, the final estimates of highly inspired people are often distant from the anchor values, implying that motivation decreases the risk of wrong decisions. However, Epley and Gilovich (2005) note that motivation is not effective in reducing the anchoring effect in all contexts. The authors conclude that incentives are useful in controlling the anchoring effect if accompanied by other factors that may enhance information processing. For instance, assessing whether individuals are certain about the direction of adjustments from anchor values is essential. According to Epley and Gilovich (2005), most people assume that they have adjusted insufficiently from the anchor values when they are confident about the direction for modifications. Motivation and certainty about the direction of adjustment help individuals reduce the anchoring effect.

Other studies illustrate the link between attitude change and the anchoring effect. Wegener et al. (2010) indicate the existence of a curvilinear effect for extreme anchor values. The attitude-change model explains that extreme values encourage people to generate counterarguments, questioning the validity of the available information or disregarding it completely. The model suggests that high anchor values minimise the anchoring effect since the perception of plausibility mediates the moderating impact of extreme values. The use of the attitude-change framework to explain the effect of extreme values on anchoring demonstrates the influence of perception on decision-making processes. Based on this model, anchor values serve different roles in the judgement process. For instance, they can be simple cues affecting choices, thus encouraging individuals to engage in effortful information processing or resulting in biased judgement (Wegener et al., 2010). Since emotions determine people's attitudes, they are explicitly used as data for achieving an informed judgement. The attitude-change framework shows that the rationality of individual decisions depends on information processing.

Preventing the anchoring effect in decision-making processes may be hard in the absence of certain conditions. Wilson et al. (1996) contend that individuals must recognise the occurrence of bias, be motivated to correct prejudice, and determine its

direction and scope. Decision-makers need to gain enough control of their choices to avoid the anchoring effect. If prejudice occurs unintentionally, it may be hard to assess the magnitude and direction of the anchoring effect. Those who are aware that anchoring effects may arise still have difficulties identifying the impact of such effects on their responses, even when they are motivated to avoid bias (Wilson et al., 1996). For instance, individuals would not know the right adjustment for their answers even if they realised that the anchor value influences their estimate of the proportion of African states in the U.N. The anchoring effect is hard to avoid, even with knowledge of its occurrence.

This subsection showed that attitude change, motivation, and insufficient adjustment are the key factors associated with the anchoring effect. While attitude change helps individuals generate arguments to question the validity of extreme anchor values, insufficient adjustment occurs when anchor values significantly influence estimates. Those who are motivated to make accurate choices are likely to engage in information search and processing to reduce the risk of an anchoring effect. The selective-accessibility model and cognitive-experiential self-theory explain the occurrence of the anchoring effect. The former contends that the anchor value often determines individuals' search for data, while the latter describes the foundation for insufficient adjustment.

The next section will address the illusion of control.

2.5 Illusion of control

Cognitive bias refers to a systematic error in one's thought patterns that affects perception and, thus, judgement and decision-making (Haselton, Nettle, & Murray, 2015). As such, cognitive bias is an essential aspect of study in business, as it often affects consumer judgement. The illusion of control and other aspects of cognitive bias affect the level of satisfaction that a consumer reports upon consuming a product.

Sloof and von Siemens (2017) define the illusion of control as a misguided belief in one's ability to control events and, consequently, outcomes. Often, the illusion of control is the result of a person's overestimation of his/her influence on results, even though no such power is demonstrated. In other words, depending on the strength of a

person's illusion of control, one may demonstrate an unreasonable faith in the favourable outcome of a decision, even though the odds are stacked against such an outcome. For instance, gamblers demonstrate an illusion of control whenever they make bets whose chances of materialising are unlikely or beyond their control. The illusion of control is misguided; simply hoping and strongly desiring a particular result does not affect the outcome. According to Casarett (2016), for the most part, the illusion of control is a mental heuristic.

Various factors cause the illusion of control and, depending on their combination, vary in intensity among different people. Thompson (2016) contends that to a certain extent, every person has an illusion of control, with effects that range from negligible to extremely strong. Gossner and Steiner (2016) argue that depending on the extent of the illusion of control, its effects could be positive or negative. When its effects are positive, this illusion may be seen as a necessary mental heuristic. For instance, the illusion of control sometimes induces a person to keep making a necessary effort to overcome challenging experiences. However, the illusion of control also leads some people to take unreasonable and uncalculated risks, such as gambling or knowingly putting oneself in danger.

Different factors cause the illusion of control among consumers, affecting its intensity, as well as the positivity or negativity of its outcome. These factors include, but are not limited to, subconscious cultural beliefs, personality, moods, an action's outcome, knowledge and information of a particular situation, level of superstition, and a person's familiarity with a specific situation. Some studies show that religious people demonstrate an illusion of control on certain decisions compared to non-religious people (Castelli et al., 2017). For instance, they may rely on their belief in a deity's help in a certain matter and, thus, act with the expectation that the outcome will be in their favour, despite evidence of the contrary. Cowley, Briley, and Farrell (2015) show that whenever people are gambling and using dice to play, they throw the dice harder when they wish to attain a high number and softer when they want a smaller number. The softness or hardness of their throw has no effect whatsoever on the outcome, as the result is based on chance, but it gives them an illusion of control over the outcome.

Regarding customer satisfaction, McCole et al. (2019) find that cognitive bias involves the tendency towards and preference for information that confirms a person's bias and beliefs. In a warped sense, a person's already deep-seated beliefs incline him/her towards actions and products that confirm these beliefs, regardless of their accuracy. Sahi (2017) states that the illusion of control appears in customer satisfaction as a self-fulfilling prophecy, whereby the consumer already has a preconceived notion of what would be satisfying. Depending on the strength of the illusion of control among customers, their level of satisfaction after consuming a product no only depends on the experience itself, but also on their prejudices and preconceived expectations.

The illusion of control is an essential factor in the study of customer logic and the determination of customer satisfaction. This is especially evident in the consumption of products that appeal to the emotions and abstract satisfaction of the customer (Rintamäki & Kirves, 2017). An example of a product whose level of satisfaction likely depends on the illusion of control is medication. To a large extent, specific medication is geared towards treating different maladies in different ways. However, So et al. (2017) find that a patient's belief in a particular treatment is likely to influence the effectiveness of said treatment in curing the illness. This is also known as the placebo effect, whereby recovery upon using a treatment or medication may be more attributed to the consumer's belief in its effectiveness than the actual properties of the drug or treatment.

Knowledge or information on the object often influence the intensity of the illusion of control. For instance, a person's prejudice against a particular destination may cause the person to have a less pleasant experience on vacation in that destination (Ozturk et al., 2019). However, were their prejudices directly addressed and corrected or declared unrelated to the person's experience, then, the vacation experience could generate an acceptable level of satisfaction. Bellé, Cantarelli, and Belardinelli (2018) note that organisations need to understand the extent to which the illusion of control affects customer satisfaction. In the modern world, the illusion of control may result from unfounded rumours or trends. Knowing this can help an organisation address consumer dissatisfaction or even prevent it.

In the past, some organisations have preyed on cognitive bias to sell their products or give their products a competitive edge. Organisations may play into the minds of their target market and appeal to irrational beliefs, such as unfounded favouritism for a particular attribute or prejudice against a different factor (Hult et al., 2017). Further, cognitive bias may be created through advertisements. For example, soda companies use the illusion of refreshment to sell unhealthy drinks to a vast target market. Due to advertisements, many people now consider soda to be more refreshing than a glass of water. In this case, cognitive bias arises from being repeatedly exposed to certain information, thus trumping a reasonable weighing of options in decision-making. Watson et al. (2015) find that appealing to cognitive bias, either by preying on them or forming them in various capacities, is a common marketing tool for achieving customer satisfaction.

The illusion of control is also subject to and often based on experience, information, or culture, but not limited to these factors. Experience affects familiarity, and studies show that familiarity gives people a feeling of control (Hardcopf et al., 2017). People tend to be more confident when they have experience in a particular situation, regardless of whether they have had favourable outcomes in the past. For instance, people who play a sport for leisure show greater confidence in winning as they play more, even if they have a history of losing. Similarly, the more informed a person is concerning a situation, the higher the chance of displaying an illusion of control concerning its outcome. Culture affects a person's belief system, and, depending on the accuracy of the knowledge it offers, consumers may express cognitive bias in varying degrees.

The next section will address the endowment effect.

2.6 Endowment effect

The business dynamics always revolve around client and customer satisfaction. In most cases, clients are drawn towards what they care about. It is common to witness customers consuming products and services with which they are familiar. In other cases, this emotional bias can cause an overvaluing or overpricing of certain commodities. This process of buying or consuming items that are viewed as more valuable than they are is known as the endowment effect.

The relationship between customer satisfaction and the endowment effect indicates that clients buy into plans, services, and products to which they relate emotionally. Hence, this framework suggests that the success of companies entirely relies on clients' preferences. Another perspective is that people would rather sell their endowments for more than their market price. Thus, a significant difference exists between what clients are willingly ready to accept and what they are prepared to buy (Chatterjee, Irmak, & Rose, 2013).

Mohammed (2019) claims that an experiment conducted in 2011 revealed that people who produce artistic creations value them more than others. In addition, the same experiment revealed that people who work hard to be awarded gifts feel a sense of entitlement to the prizes they receive and are not willing to give them away. A company that has tried this strategy is IKEA. The company usually holds events at which they ask their customers to help assemble furniture and other home items. At the end of the practical session, these people feel attached to their furniture items and end up buying them.

Hochma (2019) claims that two perspectives exist on the endowment effect: ownership and loss aversion. Loss aversion implies that the client feels emotional pain when losing a product that is equal to the pleasure of purchasing it. In addition, ownership relates to the ability of clients or customers to feel the need to pay more for a product to which they are entitled. Customers who previously had similar items in their households may be willing to buy the same product for more than it is worth.

Kahneman, Knetsch and Thaler (2008) developed a theory known as the mug experiment. They divide the sample group into two subgroups, buyers and sellers. They give mugs to the 'sellers' and ask them to value the received items. They find that the sellers place a higher value on the mugs than what the buyers are willing to pay. This experiment suggests that the price of a service or product should be based on what the client wants or deserves.

Carmon and Ariely (2000) conduct a similar experimental study using a lottery. Winners are asked to put a price on the tickets, and losers are asked how much they are willing to pay for the tickets. The results show that winners price the lottery tickets at a higher price than they are worth.

Similarly, in a similar experiment, Kahnehan, Knetsch and Thaler (1991) give 50% of the sample chocolates and the rest mugs. They then ask the groups to switch endowments. Only 10% of participants are found to be willing to switch. The results show that customers and clients easily feel entitled to what they have bought or been given. Hence, companies should produce commodities that may even be unprofitable but are familiar and popular with customers. This result supports the view that the endowment effect pulls at customers' heartstrings.

A company that used this theory unsuccessfully was United Airlines. A viral video exposed the airline after a passenger was dragged out of an overbooked plane. The airline did not anticipate that their popularity would diminish; however, their public image deteriorated. The National Basketball Association (NBA) realised that they were overvaluing their players after the general manager had not traded any of them for a while. In that case, the company was valuing itself more than others thought it was worth. This wrong valuation affected them by jeopardising millions of dollars that could be spent on expanding and diversifying the company. This result indicates that business owners, team leaders, and company managers need to ascertain that their companies are always valued what they are worth (Lewis, 2016).

Wang (2009) argues that some return policies are lenient enough to encourage the purchase of certain products. Customer satisfaction is also linked to clients' feeling that a company or brand understands their needs. For instance, clients may feel drawn towards such deals because they assume that they can easily return any items that they purchase. As a result, companies would be well advised to have indulgent return policies to increase sales and encourage customer satisfaction.

Yeon-Koo (1996) contends that warranties are among the most sought-after company return policies. The endowment effect influences this concept by helping appreciate the detrimental effects of lacking return policies. Many retailers have return policies that encourage a system of returning items with no questions asked regarding repurchase. Thus, customers feel motivated to shop and buy whatever they need, without fear.

Su (2009) shows that return policies provide customers with the peace of mind that motivates them to purchase. This phenomenon also increases impulse buying that benefits the company. Su's assumption supports return policies that aim at

increasing the sense of company reachability. Janakiraman, Syrdal, and Freling (2016) claim that using this strategy increases consumer demand. However, they also show that numerous returns can adversely affect companies, and high demand typically translates into more returns.

Saqib, Frohlich, and Bruning (2010) assert that decision-making process of product creation usually involves customers. A good example is the fact that companies produce what their consumers will consume enthusiastically. Customer involvement is based on several factors, the most common being the occasion that leads to purchase and use of the service or product. Hence, clients may feel obliged to participate in the research phase that deals with pricing products alongside other aspects, such as the social system, culture, and lifestyle of the target customers.

Espejel, Fandos, and Flavian (2009) address a sample of 441 people and find that those who show more involvement throughout the research process become more loyal than customers who are less involved. This result validates the assumption that customer involvement is directly linked to the endowment effect. In addition, customer involvement is imperative in the construction of rapport and for providing feedback on product and service delivery.

Kayeser Fatima and Abdur Razzaque (2013) address 212 respondents and find a significant relationship between building rapport and client satisfaction. They show that customer involvement plays a vital role in the moderation and mediation of the marketing aspects of the business. Hsu and Chen (2014) contend that the personality traits of the study group also impact service involvement. They address a sample of 299 respondents and conclude that friendly customers show more involvement in the business than others. Hence, personality traits appear to affect customer involvement and satisfaction.

In conclusion, the endowment effect and customer satisfaction are both part and parcel of the business world. All businesses and companies should be aware of this interdependence to increase customer satisfaction and achieve business success.

CHAPTER 3
HYPOTHESIS DEVELOPMENT

From previous study, the relevant theory, concept, and literature is reviewed. This chapter is proposed ten hypotheses, which can divide into three main parts. The first part is proposed based on relationship between cognitive biases and customer satisfaction. Next is about moderation effect of gender on the relationship between cognitive biases and customer satisfaction. The last part is about relationship between the interaction among anchoring effect, illusion of control, and endowment effect and customer satisfaction. Ten hypotheses are proposed in this study, as follows.

3.1 Relationship between cognitive biases and customer satisfaction

3.1.1 Relationship between the anchoring effect and customer satisfaction

According to the selective-accessibility model, when participants are provided with options that lie between the target and anchor estimates, they tend to test whether the target and the anchor values may be equal. The model assumes that individuals retrieve relevant information from their memory to generate a comparative judgement (Strack, Bahnik, & Mussweiler, 2016). Moreover, Bjornskov (2010) investigates life satisfaction and finds that the anchoring effect affect life satisfaction evaluation. In practical, anchoring effect can play a role in first impressions in the pre-purchase stage. For example, when a merchant offers the first items at 30 USD and the next one at 20 USD, the customer is impressed and satisfied with the lower price based on the previous valuation. The more the customer is affected by the anchoring effect, the more impressed and satisfied he/she is. In addition, Kuo and Nakhata (2019) found that electronic word of mouth impacts satisfaction of consumer in purchased product because of anchoring effect.

By testing this hypothesis, this study will compare the anchor value to the target value. An arbitrary value serves as the anchor value. In particular, two groups of customers—those manipulated by an anchoring value and those who are not

manipulated—are used for comparing the effects. The subjects undergo an adjustment process to reach the final level of satisfaction. Ultimately, the adjustment process terminates at the nearest upper or lower bound of a broad range of estimated values.

The study expects the anchoring effect to influence customer satisfaction. Hence, any insufficiency in the adjustment is attributed to anchoring bias. Thus, this leads to the following hypothesis.

H1a: The presence of anchoring effect influences customer satisfaction.

3.1.2 Relationship between the illusion of control and customer satisfaction

McCole et al. (2019) find that cognitive bias involves the tendency towards and preference for information that confirms a person's existing bias and beliefs. In other words, a person's already deep-seated beliefs incline him/her towards actions and products that confirm these beliefs, regardless of their accuracy.

Hui, Tao, and Hongshen (2011) find that the illusion of control negatively affects customer satisfaction. When people feel in control, their expectations increase. In some instances, if expectations are high, customer satisfaction is negatively influenced. This study expects a significant effect of the illusion of control on the level of satisfaction that a consumer reports upon purchasing a product.

Moreover, Taylor and Brown (1988) explain that the illusion of control is a form of positive illusion. Positive illusions are unrealistic attitudes, a form of self-deception and self-enhancement. Roman (2010) find that self-deception negatively influences customer satisfaction, while Ogunnaike and Kehinde (2011) show that self-enhancement negatively affects customer satisfaction. Thus, this leads to the following hypothesis.

H1b: The presence of illusion of control influences customer satisfaction.

3.1.3 Relationship between the endowment effect and customer satisfaction

The relationship between customer satisfaction and the endowment effect indicates that clients buy into plans, services, and products to which they relate emotionally. The underlying assumption is that customers are drawn towards what they regard highly, as they consume more of the products and services with which they are familiar. Yan and Bao (2018) find that the endowment effect generates, on average, higher satisfaction in households. This result is in line with Chatterjee, Irmak, and Rose (2013), who argue that people are willing to sell their belongings for a higher price than their market value. As the idiom 'Sweet Lemon' implies, customers are more satisfied with goods that they own. Those who are more subject to the endowment effect experience higher levels of customer satisfaction.

In addition, Morewedge and Giblin (2015) found that endowment effect came from the attachment of owner. Ramkissoon, Smith, and Weiler (2013) also found that in the context of tourism that have an attachment, there is a positive influence on satisfaction. Thus, endowment effect should positively affect customer satisfaction. Thus, this leads to the following hypothesis:

H1c: The presence of endowment effect influences customer satisfaction.

3.2 Moderation effect of gender on the relationship between cognitive biases and customer satisfaction

Adenzato et al. (2017), based on the theory of mind, explain that females score higher on tests of the affective dimension than males when stimulated by social cognition. Benenson and Christakos (2003) also show that males have a more systematising style than females. When people are manipulated by the cognitive aspect (in terms of numbers and being generally described as a systematizing individual), females respond more than males to the affective aspect with respect to customer satisfaction. This study aims to determine whether the customer's gender moderates the relationship between the anchoring effect and customer satisfaction. In other words, this study seeks to determine whether the impact of the anchoring effect (independent

variable) on customer satisfaction (dependent variable) depends on the gender of the customer (moderating variable).

Alan et al. (2020) also find that females are less keen than men on making decisions on behalf of others and are less prone to have a position of power in groups. In other words, women experience a loss of control in the social context compared to men. Hence, females should experience higher satisfaction when achieving control. This study seeks to determine whether the impact of the illusion of control (independent variable) on customer satisfaction (dependent variable) depends on the gender of the customer (moderating variable).

According to Rudmin (1994), females' possessions symbolize emotional attachment and interpersonal relations. Generally, females preserve their objects more than males implying that females are more satisfied with their possessions than males. In addition, Dommer and Swaminathan (2013) find that being male eliminated the relationship between possession and value of the good while being female does not. Herman (2014) mentions that there is significant correlation between value and satisfaction. This leads to the following hypotheses:

H2a: The relationship between the presence of anchoring effect and customer satisfaction is stronger on female than male.

H2b: The relationship between the presence of illusion of control and customer satisfaction is stronger on female than male.

H2c: The relationship between the presence of endowment effect and customer satisfaction is stronger on female than male.

3.3 Relationship between the interaction among anchoring effect, illusion of control, and endowment effect and customer satisfaction

This study's primary contribution lies in considering various facets of cognitive bias simultaneously, while existing studies tested the impact of each aspect of cognitive bias on customer satisfaction separately, such as Liu et al. (2019), Coluccia, Gamboz, and Brandimonte (2011), Stettinger et al. (2015), and Sahi (2017).

Weed et al. (2010) argue that according to the theory of mind, more than one cognitive mechanism can affect the affective mechanism. Hence, the interaction effect between three selected aspects of cognitive bias should have a significant impact on customer satisfaction. Moreover, Hoven, Amsel, and Tyano (2019) mention that more than one aspect of cognitive bias can occur in a situation, increasing the effect of cognitive bias if the effects occur in the same direction.

This study addresses the anchoring effect, illusion of control, and endowment effect as representative aspects of cognitive bias, and it translates these three aspects into four combinations: anchoring effect and illusion of control, anchoring effect and endowment effect, illusion of control and endowment effect, and anchoring effect, illusion of control, and endowment effect.

This leads to the following hypotheses:

H3a: The presence of anchoring effect and illusion of control together influence customer satisfaction.

H3b: The presence of anchoring effect and endowment effect together influence customer satisfaction.

H3c: The presence of illusion of control and endowment effect together influence customer satisfaction.

H3d: The presence of anchoring effect, illusion of control, and endowment effect together influence customer satisfaction.

Figures 3.1 and 3.2 summarise the hypothesis development. This study expands the body of knowledge on cognitive bias and customer satisfaction by proposing an experimental design that simultaneously accounts for three facets of cognitive bias. Since customer satisfaction can occur at the pre-purchase, point-of-purchase, and post-purchase stages, cognitive bias may also arise in all stages. In particular, the anchoring effect can occur in the pre-purchase stage, the illusion of control can occur in the point-of-purchase stage, and the endowment effect can occur in the post-purchase stage.
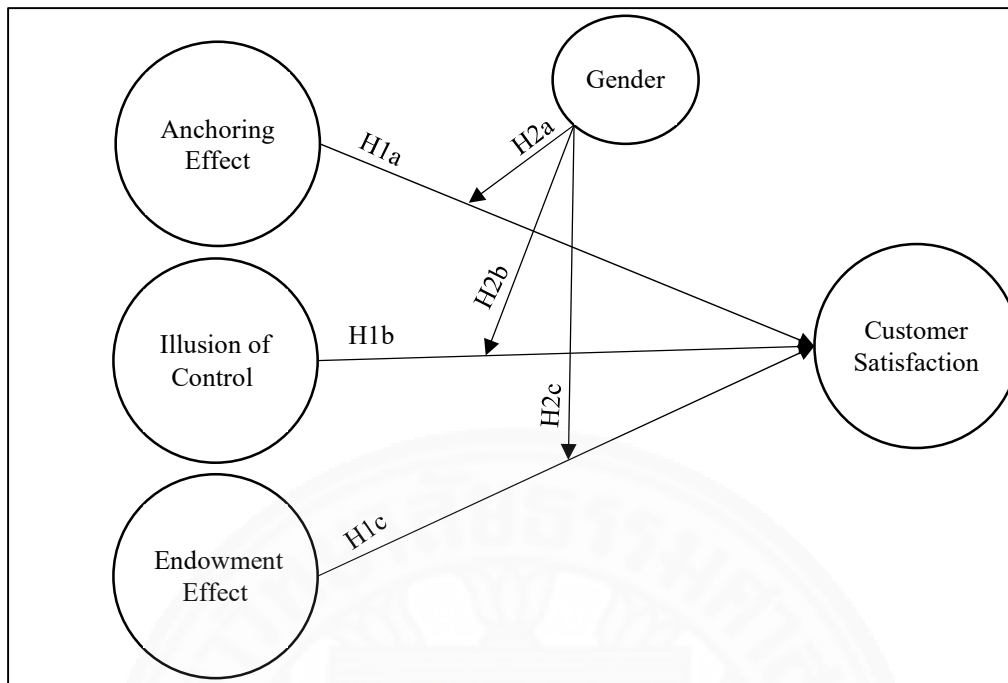
FIGURE 3.1

CONCEPTUAL FRAMEWORK FOR HYPOTHESES

H1A, H1B, H1C, H2A, H2B, AND H2C
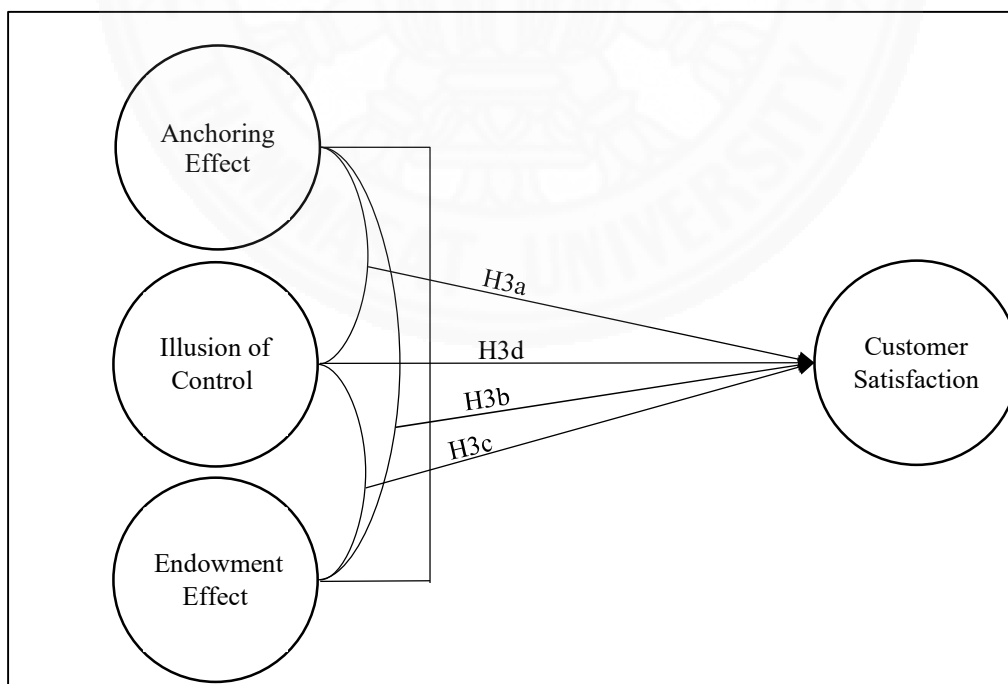
FIGURE 3.2

CONCEPTUAL FRAMEWORK FOR HYPOTHESES

H3A, H3B, H3C, AND H3D

3.4 Theoretical gap

From the literature reviews, it is shown that the theory of mind is the ability to attribute mental states — beliefs, intents, desires, emotions, knowledge, etc. — to oneself and to others. In addition, theory of mind is a multidimensional process that requires the integration of several components (Amodio & Frith, 2006).

Although there are plenty of researches using the theory of mind in psychology and neuroscience, it has not been used in the marketing field. Thus, the theoretical gap in this study are as follows

1. According to this theory, Shamay-Tsoory et al. (2010) found that the cognitive aspect is a prerequisite for the affective aspect. Customer satisfaction is in affective state (Phillips & Baumgartner, 2002), while cognitive bias is in cognitive state (Ariely, 2008). Based on the theory of mind, cognitive bias should affect customer satisfaction. This expected relationship has never been empirically tested before.

2. When considering a role of gender in the theory of mind, Adenzato et al. (2017) explained that females score higher on tests of affective dimension than males when stimulated by cognition. Nevertheless, the moderating effect of gender on the relationship between cognitive biases and customer satisfaction has never been tested. This study thus aims to close this theoretical gap by investigating the moderation effect of gender.

3. According to Weed et al. (2010), more than one cognitive mechanism have an impact on affective mechanisms. Most studies in marketing field considered only one cognitive bias at a time. More than one cognitive bias can yield an interaction effect on the relationship with customer satisfaction. Thus, it is become one of the objectives of this study to investigate such effect and close this theoretical gap.

3.5 Chapter summary

In this chapter, the literature review on the theoretical background and main concepts from Chapter two are utilized to develop hypotheses in this study. The study's primary theoretical reference is the theory of mind. Shamay-Tsoory et al. (2010) argue

that the cognitive state is a prerequisite for the affective state. Cognitive bias represents a cognitive state, while customer satisfaction is an affective state.

In addition, cognitive bias comprises three aspects (Kahneman, 2012), namely, heuristics, overconfidence, and choice. This study focuses on the anchoring effect, which represents heuristics, the illusion of control, which represents overconfidence, and the endowment effect, which represents choice. To verify that the cognitive state is a prerequisite for the affective state, hypotheses 1a, 1b, and 1c are tested.

Adenzato et al. (2017) explain that females score higher on tests of the affective dimension than males when stimulated by cognition. Thus, a moderation effect of gender should be observed in the relationship between each aspect of cognitive bias and customer satisfaction. To verify this conclusion, hypotheses 2a, 2b, and 2c are tested.

Furthermore, Weed et al. (2010) contend that more than one cognitive mechanism can affect affective stage. Hence, the interaction between three selected components of cognitive bias should have a significant impact on customer satisfaction. To verify this conclusion, hypotheses 3a, 3b, 3c, and 3d are tested.

CHAPTER 4
RESEARCH METHODOLOGY

An experimental design is used for testing the relationship between each facet of cognitive bias—the anchoring effect, illusion of control, and endowment effect—and customer satisfaction. The moderation effect of gender on the relationship between cognitive bias and customer satisfaction is also tested. Whether the interaction among the anchoring effect, illusion of control, and endowment effect has an impact on customer satisfaction is also investigated.

4.1 Measurement of constructs

In this research, there are five constructs consisting of anchoring effect, illusion of control, endowment effect, gender, and customer satisfaction. The details of measurement are as follows:

The anchoring effect is defined as the disproportionate influence found in decision making; that is judgments are made with biases from the beginning (Tversky & Kahneman 1974). In this research, anchoring effect is measured in two values; 1 is for manipulated by the anchoring effect and 0 is for not manipulated by the anchoring effect. Jacowitz and Kahneman (1995) explain that the value above the 85th percentile are claimed as high anchor numbers. Wilson et al. (1996) also set the anchor value of percentage that current student of University of Virginia get cancer in the next 40 years by calculating 85th percentile from pre-test. This research adopt the similar approach by providing high anchoring value by informing undergraduate students (research participants) that the average number of signatures obtained with a ballpoint pen is about 6,000 time, which is higher than the 85th percentile of 5,000 times (The elaborated detail is in Section 4.4).

The tendency to overestimate one's own ability in controlling circumstances is defined by Thompson (1999) as the illusion of control. In this research, the illusion of control is measured in two value; 1 is for manipulated by the illusion of control and 0 is for not manipulated by the illusion of control. Alloy and Abramson (1979) proposed

in seminal work that if probability of outcome is high, people will overrate the potential cause and the outcome. This is key development of illusion of control. In empirical research, Matute, Yarritu, and Vadillo (2011) set the probability of outcome of recovery from illness by fictitious medicine in manipulated illusion of control group to 0.8. In addition, Yarritu, Matute, and Vadillo (2014) mentioned that the percentage for high illusion of control manipulation is 66.67% or upper, however, in their study, they set the probability of outcome of recovery from illness by fictitious medicine to 0.8. Novovic et al. (2012) manipulated illusion of control by asking participants to see 18 pictures of abstract shape in PowerPoint consecutively and answer what is in abstract shape. Regardless of their answers, the computer shows the score about 89 – 100%. This research has adopted the similar approach. In this research, participants who are manipulated by the illusion of control are allowed to use the computer to see the picture of two pens. One is usable while the other is not. They are asked to guess which pen is usable and make the guess ten times. Regardless of their answers, they are told that they guessed correctly approximately 80–90% of times.

Kahneman, Knetsch, and Thaler (1991) propose that people are more likely to retain an object they own than acquire the same object they do not own, and this refers to the endowment effect. In this research, the endowment effect is measured in two values; 1 is for manipulated by the endowment effect and 0 is for not manipulated by the endowment effect. Participants who are manipulated by the endowment effect are told that the pen is a gift for their participation while participants who are not manipulated by the endowment effect are told that the pen is only used in the experiment. This study used the method of measuring the endowment effect from previous research, when things are given to those in the treatment group. For example, in the study of Reb and Connolly (2007), participants have been divided into two groups. The first group is given the ownership condition, which was told that participants now owned a chocolate bar. One the other hand, those in the no ownership condition were told that they did not own a chocolate bar at the beginning. The same process was applied in this research but changed a chocolate bar to a pen.

This research use gender based on physiology as moderation variable. Gender is measured in two value; 1 is for female and 2 for male.

The last construct is customer satisfaction. Kotler and Keller (2012) defined satisfaction as a 'person's feeling of pleasure or disappointment, which resulted from comparing a product's perceived performance or outcome against his/her expectations'. The measurement of customer satisfaction in this research is the average of three questions based on the study of Fornell et al. (2006). It is 10 Likert scale in each question. Three questions are 1) 'How satisfied or dissatisfied are you with this pen?', 2) 'To what extent this pen meets your expectations?', and 3) 'Try to imagine a pen that is perfect in every aspect. How near or far from this ideal you find this pen?'.

TABLE 4.1

SUMMARY OF CONSTRUCT MEASUREMENT

Construct	Operational definition	Measurement	Reference
Anchoring effect	The disproportionate influence on decision makers to make judgments that are biased toward an initial point.	Participants, who were manipulated by the anchoring effect, were told by the experimenter that the average number of signatures obtained with a ballpoint pen is about 6,000 times.	Tversky and Kahneman (1974), Jacowitz and Kahneman (1995), Wilson et al. (1996).
Illusion of control	The tendency for people to overestimate their ability to control events.	Participants, who were manipulated by the illusion of control, were allowed to use the computer to see the picture of two pens. One is usable while the other is not. They are asked to guess, which pen is usable and make the guess ten times. Regardless of their answers, they are told that they guessed correctly approximately 80–90% of times.	Thompson (1999), Alloy and Abramson (1979), Matute, Yarritu, and Vadillo (2011), Yarritu, Matute, and Vadillo (2014), Novovic et al. (2012)

Construct	Operational definition	Measurement	Reference
Endowment effect	People are more likely to retain an object they own than acquire that same object when they do not own it.	Participants, who were manipulated by the endowment effect were told that the pen is a gift for their participation.	Kahneman, Knetsch, and Thaler (1991), Reb and Connolly (2007).
Gender	Gender based on physiology.	1 is for female and 2 for male.	-
Customer satisfaction	'Person's feeling of pleasure or disappointment, which resulted from comparing a product's perceived performance or outcome against his/her expectations'.	Three questions with 10 Likert-scale consist of 'How satisfied or dissatisfied are you with this pen?', 'To what extent this pen meets your expectations?', and 'Try to imagine a pen that is perfect in every aspect. How near or far from this ideal you find this pen?'.	Fornell et al. (2006), Atulkar and Kesari (2017), Rego, Morgan, and Fornell (2013), Fornell et al., (2006), Anderson, Fornell, and Mazvancheryl (2004), Anderson, Fornell, and Lehmann (1994).

4.2 Research design and procedure

To investigate the impact of cognitive bias on customer satisfaction and the moderation effect of gender in the relationship between cognitive bias and customer satisfaction, undergraduate students are employed as study's participants. They have similar preferences, expenses, relevance, and knowledge. However, to ensure the validity of the experiment, manipulation is conducted. This section describes the study's participants and design, procedure and manipulation, manipulation check, and statistical methods employed.

4.3 Participants and design

This study uses a between-subject design. The scenario is differentiated by the different aspects of cognitive bias producing 2 x 2 x 2 = eight scenarios. In most studies, 30 subjects belong to each group (Myes & Hansen, 2012). However, in this study, we employ more than 60 participants per scenario (about 30 males and 30 females) for a total of more than 480 participants, divided by gender almost equally. Participant will receive a pen for taking part in the study. They will not receive money or scores for their participation. A standard of comparison is defined in scenario eight to ensure that the experiment's result is caused by the condition of being manipulated. Participants in scenario eight, which is the control group, are not manipulated by any cognitive biases. Table 4.2 describes the eight scenarios.

Since this research studies the effect of cognitive biases on customer satisfaction, the product category should be any objects the participants are familiar with and are used by function. It is because it can reduce the effect of preference in that product category. This study wants participants to have emotion towards the product only from cognitive bias stimulus. A pen is selected to be a studied product in this research. The reason for selecting pen in this study come from the study of Dempsey and Mitchell (2010), which mentioned that pen is product category that people were acquainted with. It is also considered to be utilitarian and functional product. Therefore, the participants would not typically use their emotions when making a choice.

TABLE 4.2

SCENARIOS OBTAINED THROUGH MANIPULATION

Scenario	Manipulated by the Anchoring Effect	Manipulated by the Illusion of Control	Manipulated by the Endowment Effect
1	Yes	Yes	Yes
2	Yes	Yes	No
3	Yes	No	Yes
4	Yes	No	No
5	No	Yes	Yes
6	No	Yes	No
7	No	No	Yes
8	No	No	No

4.4 Experimental procedures

Each participant is assigned to a scenario, to control the confounding variables such as place, ages, researcher's influence, this experiment is conducted in a computer room at Faculty of Management Science, Silpakorn University between 3 – 21 February 2020. Each experiment scenario is conducted by the same set of three research assistants who are fourth year bachelor's degree students. They are trained for conducting experiment by researcher. They had been trained by researcher in the mock experiment to ascertain that experiment will be conducted correctly and objectively.

In this research, three research assistants have their responsibilities. The first one is in front of the computer room. She has responsibilities of explaining research instruction and moderating all procedures. The second one has responsibilities of distributing and collecting pen (in actuality, only distributing), paper, and questionnaire. The last one is at the back of the computer room. She has responsibilities of observing throughout the course of the experiments. Based on the research conducted, no deviation of the planned experimental procedures was found.

Each step is as follows.

Step 1

When participants are ready for the experiment, they listen to a song in a calm tone for about three minutes to achieve a neutral mood. They are told that this experiment is part of a doctoral dissertation, and the data are confidential. They are requested not to play on their cell phone and not to talk during the experiment.

Sleigh and McElroy (2014) found that both music and writing can shift participants mood both positive to negative and negative to positive. They allowed participants to write or listen in three minutes. Since this research is measured satisfaction which is in affective state. Controlling participants mood to be in similar level is necessary. Thus, listening to a song is selected as a tool for controlling participants' mood. Instrument song name "I don't care" is selected in this research.

Step 2

This step concerns manipulation through the anchoring effect following the procedure described in Table 4.3.

TABLE 4.3

PROCEDURE FOR THE MANIPULATION

THROUGH THE ANCHORING EFFECT

	Manipulated by the Anchoring Effect	**Not Manipulated by the Anchoring Effect**
Procedure	Participants are told by experimenter that the average number of signatures obtained with a ballpoint pen is about 6,000 times	Not doing anything

The reason for selecting 6,000 times based on the study of Jacowitz and Kahneman (1995) which explained that the 85th percentile and upper are claimed as high anchor numbers. The 30 undergraduate students are asked the question 'How many times you think you can sign using a ballpoint pen, on average?' The average answer is 2,355 times and the 85th percentile is equal 5,000 times. It is suitable to use 6,000 times in this priming task.

Step 3

This step concerns manipulation through the illusion of control following the procedure described in Table 4.4

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TABLE 4.4

PROCEDURE FOR THE MANIPULATION

THROUGH THE ILLUSION OF CONTROL

</div>

	Manipulated by the Illusion of Control	Not Manipulated by the Illusion of Control
Procedure	• Participants are allowed to use the computer to browse into a set website. • They see the picture of two pens. They are told that one is usable, while the other is not. They are asked to guess which pen is usable and make the guess ten times. • Regardless of their answers, they are told that they guessed correctly approximately 80–90% of times. Since the average probability of a correct guess is 50%, this information will lead participants to overestimate their ability to control events • To be sure that the manipulation succeeds, participants are asked to repeat the procedure for three rounds.	Not doing anything

The reason for selecting guesses correctly approximately 80–90% of times come from the study of Yarritu, Matute, and Vadillo (2014) which mention that the percentage for high illusion of control manipulation is 66.67% or upper. It is suitable to use 80-90 percent in this priming task.

Step 4

This step concerns manipulation through the endowment effect following the procedure described in Table 4.5.

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TABLE 4.5

PROCEDURE FOR THE MANIPULATION

THROUGH THE ENDOWMENT EFFECT

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	Manipulated by Endowment Effect	**Not Manipulated by Endowment Effect**
Procedure	• Participants receive pen and paper • Participants are told that the pen is a gift for their participation. They are also asked to copy a Thai poem (which will be shown on a projector board) on a paper, using the pen. The task takes approximately three minutes	• Participants receive pen and paper • Participants are told that the pen can be used only in the experiment, and they must give it back at the end of the experiment. They are also asked to write a Thai poem (which will be shown on a projector board) on a paper, using the pen. The task takes approximately three minutes

The selection of this procedure is applied from Reb and Connolly (2007). In that research, participants have been divided into two groups. The first group is given the possession of the object and the other is not given. This research follows that procedure.

Step 5

All participants in all scenarios receive a questionnaire–(shown in the Appendix). They are required to answer each question based on the instructions of the experimenter, as shown in Table 4.6.

For manipulation check of anchoring effect, although, many prior researches such as those of de Wilde, Ten Velden, and De Dreu (2018) and Brewer and Chapman (2002) did not check manipulation, this research still checked whether participants still remembered the high anchoring value by the question 'How many times you think you can sign using a ballpoint pen, on average?'

For illusion of control, from the study of Matute, Yarritu, and Vadillo (2011), they asked participant to answer the question by ranking 0 – 100 scale, where the average probability is equal 50. The result is found that participants in the manipulated by illusion of control group rate score higher than participants in not manipulated by illusion of control group. This research is adapted from that research by asking the question "'If you make a guess regarding usable or unusable pens for ten times, how many times you think you will guess correctly?'

For the endowment effect, it is relevant with psychological ownership. Pierce, Kostova, and Dirks (2001) mentioned the question to measure psychological ownership as 'what do I feel is mine? Peck and Shu (2009) used the concept of psychological ownership to measure endowment effect manipulation while Reb and Connolly (2007) asked participants that 'How much do you feel like you own the chocolate bar?'. For this research, participants were asked the question. 'Do you think you own of the pen?' to check whether the manipulation was successful.

TABLE 4.6

QUESTIONS IN EACH MANIPULATION

Cognitive Bias	Manipulated by	Not Manipulated by
Anchoring effect	Participants answer the question 'How many times you think you can sign using a ballpoint pen, on average?'	Participants answer the question 'How many times you think you think you can sign using a ballpoint pen, on average?'
Illusion of control	Participants answer the question 'If you make a guess regarding usable or unusable pens for ten times, how many times you think you will guess correctly?'	Participants answer the question, 'If you make a guess regarding usable or unusable pens for ten times, how many times you think you will guess correctly?'
Endowment effect	Participants answer the question 'Do you think you own of the pen?'	Participants answer the question 'Do you think you own the pen?'

Step 6

All participants are asked to answer three questions about their satisfaction with the pen, based on Fornell et al. (2006): 'How satisfied or dissatisfied are you with this pen?' (1 = very dissatisfied, 10 = very satisfied); 'To what extent this pen meets your expectations?' (1 = not at all, 10 = totally); 'Try to imagine a pen that is perfect in every aspect. How near or far from this ideal you find this pen?' (1 = very far from, 10 = cannot get any closer).

All questions in this step is in Thai language. The back translation is used to compare the translated document with the original for accuracy and quality. The dissertation advisor and one expert in marketing field check validity in each question. Then, the undergraduate students are asked for understanding of each question.

Step 7

All participants are asked to answer the question 'Have you ever seen the pen that you received before?'. All questionnaires with a positive answer are discarded.

Step 8

Last, the experimenters collect the questionnaires and tell the participants that the pen in their hand is a gift for participating.

This research tried to control the possible confounding variables. Undergraduate students were selected as participants in this study as they are similar in age group and general preferences and lifestyles. All scenarios were conducted in the same computer room, using computer in the same specification and all scenarios were conducted by the same assistant researchers.

The procedure of experimental design can be summarized in Figure 4.1
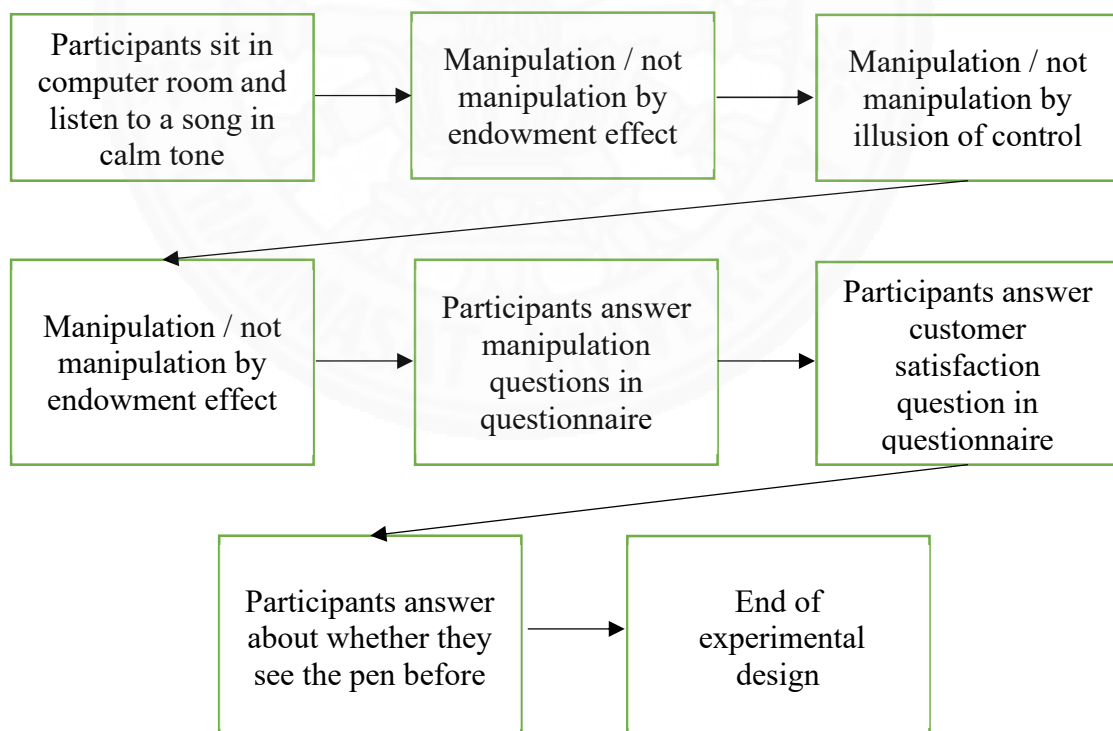
FIGURE 4.1 THE PROCEDURES OF EXPERIMENTAL DESIGN

4.5 The analysis of the manipulation check

Anchoring effect: The questionnaire is divided into two groups: manipulated by the anchoring effect and not manipulated by the anchoring effect. The data obtained from the question 'How many times you think you can sign using a ballpoint pen, on average?' are analysed using independent t-tests. If the difference between the two groups is statistically significant, the manipulation is successfully conducted.

Illusion of control: The questionnaire is divided into two groups: manipulated by the illusion of control and not manipulated by the illusion of control. The data obtained from the question 'If you make a guess regarding usable or unusable pens for ten times, how many times you think you will guess correctly?' are analysed using independent t-tests. If the difference between the two groups is statistically significant, the manipulation is successfully conducted.

Endowment effect: The questionnaire is divided into two groups: manipulated by the endowment effect and not manipulated by the endowment effect. The data obtained from the question 'Do you think you own the pen' are analysed using two proportion Z-tests. If the difference between the two groups is statistically significant, the manipulation is successfully conducted.

4.6 Statistical methods

There are three independent variables in this research. First is manipulated by the anchoring effect. If the participants are in the scenario which is manipulated by the anchoring effect, the data in this variable is 1. On the other hand, if the participants are in the scenario which is not manipulated by anchoring effect, the data in this variable is 0.

The second independent variable is manipulated by the illusion of control. If the participants are in the scenario which is manipulated by the illusion of control, the data in this variable is 1. On the other hand, if the participants are in the scenario which is not manipulated by illusion of control, the data in this variable is 0.

The third independent variable is manipulated by the endowment effect. If the participants are in the scenario which is manipulated by the endowment effect, the data in this variable is 1. On the other hand, if the participants are in the scenario which is not manipulated by endowment effect, the data in this variable is 0.

There is one moderation variable which is gender. If the participants are female, the data in this variable is 1. If the participants are male, the data in this variable is 2.

There is one dependent variable which is customer satisfaction. The data come from the average of three questions which are based on Fornell et al. (2006). It is 10 Likert scale in each question, where 0 means that they are least satisfied and 10 means that they are most satisfied.

The data obtained from the experiment participants, used for hypothesis testing, are summarised in Table 4.7.

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TABLE 4.7

DATA

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Data	Type of Data
Manipulated by the anchoring effect	Nominal
Manipulated by the illusion of control	Nominal
Manipulated by the endowment effect	Nominal
Gender	Nominal
Customer satisfaction	Interval

4.6.1 Testing the effect of cognitive biases on customer satisfaction

In line with hypotheses H1a, H1b, and H1c, this study assumes the relationship between the anchoring effect, illusion of control, and endowment effect, and customer satisfaction as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon,$$

where Y is customer satisfaction, X_1 is the anchoring effect (0 = not manipulated, 1 = manipulated), X_2 is the illusion of control (0 = not manipulated, 1 =

manipulated), X_3 is the endowment effect (0 = not manipulated, 1 = manipulated), α and β are the parameters of interest, and ε is the error term.

For testing hypotheses 1a, 1b, and 1c, independent t-test is employed.

First, the assumptions for independent t-test were teste to identify whether the data are normally distributed. Shapiro-Wilk test for normality was applied. The equality of the variance of populations from which the samples are selected was also tested by the Levene's test for homogeneity of variances.

4.6.2 Testing the moderating effect

From hypothesis H2a, this study assumes that the relationship between the anchoring effect and customer satisfaction is moderated by the gender of the customer. A conceptual model of the moderating effect of gender in the relationship between the anchoring effect and customer satisfaction is shown in Figure 4.2.
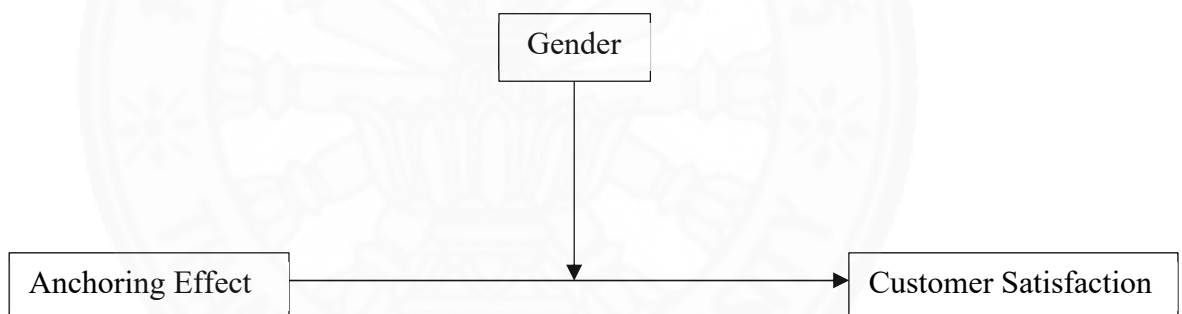
FIGURE 4.2

MODERATING EFFECT OF GENDER IN THE RELATIONSHIP BETWEEN THE ANCHORING EFFECT AND CUSTOMER SATISFACTION

In line with hypothesis H2b, this study assumes that the relationship between the illusion of control and customer satisfaction is moderated by the gender of the customer. The conceptual model of the moderating effect of gender in their relationship is shown in Figure 4.3.

```
                          ┌─────────┐
                          │ Gender  │
                          └────┬────┘
                               │
                               ▼
┌─────────────────────┐                    ┌───────────────────────┐
│ Illusion of Control ├───────────────────►│ Customer Satisfaction │
└─────────────────────┘                    └───────────────────────┘
```
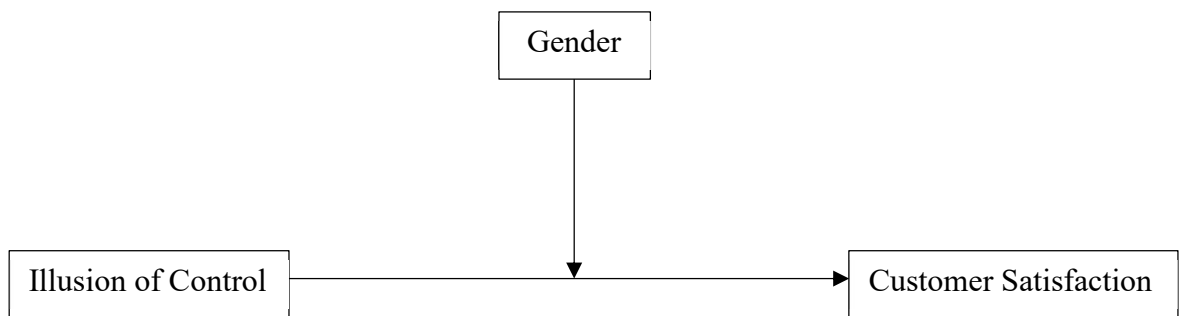
FIGURE 4.3 MODERATING EFFECT OF GENDER IN THE RELATIONSHIP BETWEEN THE ILLUSION OF CONTROL AND CUSTOMER SATISFACTION

In line with hypothesis H2c, this study assumes that the relationship between the endowment effect and customer satisfaction is moderated by the gender of the customer. Figure 4.4 reports the conceptual model of the moderating effect of gender in their relationship.

```
                          ┌─────────┐
                          │ Gender  │
                          └────┬────┘
                               │
                               ▼
┌─────────────────────┐                    ┌───────────────────────┐
│ Illusion of Control ├───────────────────►│ Customer Satisfaction │
└─────────────────────┘                    └───────────────────────┘
```
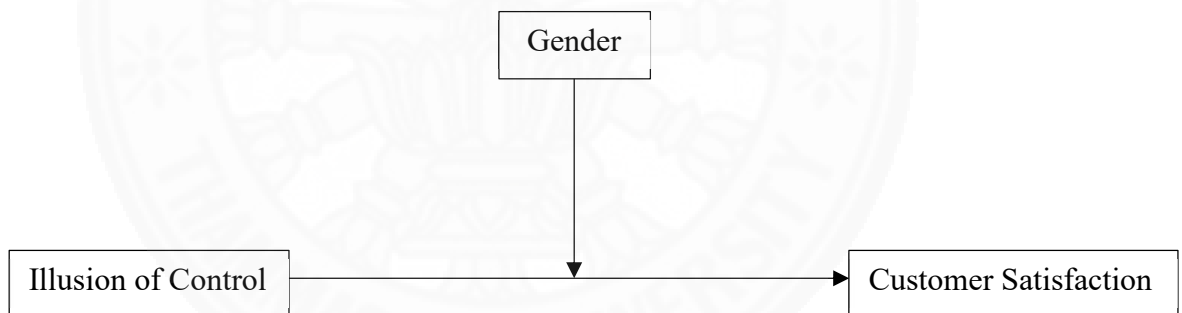
FIGURE 4.4 MODERATING EFFECT OF GENDER IN THE RELATIONSHIP BETWEEN THE ENDOWMENT EFFECT AND CUSTOMER SATISFACTION

For testing hypotheses 2a, 2b, and 2c, two-way ANOVA is employed.

First, the assumptions for two-way ANOVA are tested, namely, the observations within each sample are independent and the populations are normally distributed. A Shapiro-Wilk test was applied for the normality test. The equality of variance between populations from which the samples are selected was also tested by the Levene's test for homogeneity of variances (Moore, Notz, & Fligner, 2015).

4.6.3 Testing the interaction effect

The simultaneous effect of more than one aspect of cognitive bias on customer satisfaction is also verified. For testing H3a, whether the interaction between the anchoring effect and the illusion of control has a significant impact on customer satisfaction is tested, as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2 + \varepsilon,$$

where Y is customer satisfaction, X_1 is the anchoring effect (0 = not manipulated, 1 = manipulated), X_2 is the illusion of control (0 = not manipulated, 1 = manipulated), α and β are the parameters of interest, and ε is the error term.

For testing H3b, whether the interaction effect between the anchoring effect and the endowment effect has a significant impact on customer satisfaction is verified, as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_3 + \beta_3 X_1 X_3 + \varepsilon,$$

where Y is customer satisfaction, X_1 is the anchoring effect (0 = not manipulated, 1 = manipulated), X_3 is endowment effect (0 = not manipulated, 1 = manipulated), α and β are the parameters of interest, and ε is the error term.

For testing H3c, whether the interaction effect between the illusion of control and the endowment effect has a significant impact on customer satisfaction is verified, as follows:

$$Y = \alpha + \beta_1 X_2 + \beta_2 X_3 + \beta_3 X_2 X_3 + \varepsilon,$$

where Y is customer satisfaction, X_2 is the illusion of control (0 = not manipulated, 1 = manipulated), X_3 is the endowment effect (0 = not manipulated, 1 = manipulated), α and β are the parameters of interest, and ε is the error term.

For testing hypotheses 3a, 3b, and 3c, two-way ANOVA is employed.

First, the assumptions for two-way ANOVA are tested, namely, the observations within each sample are independent, and the populations are normally or

approximately normally distributed. The latter condition is verified using a Shapiro-Wilk test for normality. Last, the populations from which the samples are selected must have equal variances, which are tested by the Levene's test for homogeneity of variances (Moore, Notz, & Fligner, 2015).

With respect to H3a, the main effects are the impact of the anchoring effect and the effect of the illusion of control on customer satisfaction. The interaction between the two has an impact on the anchoring effect, and the illusion of control affects customer satisfaction.

Regarding H3b, the main effects are the impact of the anchoring effect and the impact of endowment effect on customer satisfaction. The interaction has an impact on the anchoring effect, and the endowment effect affects customer satisfaction.

With respect to H3c, the main effects are the impact of the illusion of control and the impact of the endowment effect on customer satisfaction. The interaction has an impact on the illusion of control, and the endowment effect affects customer satisfaction.

The significance of each of the main effects and interactions is assessed by F-statistics (Moore, Notz, & Fligner, 2015).

Finally, for testing H3d, whether the interaction between the anchoring effect, illusion of control, and endowment effect has a significant impact on customer satisfaction is verified, as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_1 X_2 + \beta_5 X_1 X_3 + \beta_6 X_2 X_3 + \beta_7 X_1 X_2 X_3 + \varepsilon,$$

where Y is customer satisfaction, X_1 is the anchoring effect (0 = not manipulated, 1 = manipulated), X_2 is the illusion of control (0 = not manipulated, 1 = manipulated), X_3 is the endowment effect (0 = not manipulated, 1 = manipulated), α and β are the parameters of interest, and ε is the error term.

For testing hypotheses 3d, three-way ANOVA is employed.

Fist, the assumptions for using a three-way ANOVA are tested, namely, the observations within each sample are independent, and the populations are normally or approximately normally distributed, which is tested by the Shapiro-Wilk

test for normality. Last, the populations from which the samples are selected must have equal variances, which are tested by the Levene's test for homogeneity of variances (Cohen, 2008).

With respect to H3d, the main effects are the impact of the anchoring effect, the effect of the illusion of control, and the impact of the endowment effect on customer satisfaction. The interactions between the anchoring effect and the illusion of control, the anchoring effect and the endowment effect, and the illusion of control and the endowment effect have an impact on customer satisfaction. Last, the interaction among the anchoring effect, illusion of control, and endowment effect has an impact on customer satisfaction.

The significance of each of the main effects and interactions is assessed by F-statistics (Cohen, 2008).

All hypotheses tests are to use a significance level of 0.05. In addition, if a significance level is more than 0.10, it means it has no impact on that hypothesis.

CHAPTER 5
DATA ANALYSIS AND FINDINGS

This chapter reports the results of the experimental design and hypothesis testing procedure. A total of 524 participants in eight scenarios are addressed. This section describes the participants' profile, the hypothesis testing results, and the analysis results.

5.1 Participant profiles

As explained in Chapter 4, the study's participants are undergraduate students because they have similar preferences, expenses, relevance, and knowledge. A total of 524 undergraduate students (266 females and 258 males) from the Faculty of Management Science, Silpakorn University, Phetchaburi Information Technology Campus participated in the study.

First, 36 females and 36 males were included in each scenario, for a total of 576 participants. However, 52 participants (22 females and 30 males) were removed from the analysis because of incomplete or unreasonable or irrational answers. For instance, to the question *'If you make a guess regarding usable or unusable pens for ten times, how many times you think you will guess correctly?'* some participants answered 'more than ten times'.

All participants go along with procedure systematically. They do not use telephone and do not talk each other during the experiment session. In addition, the computer and the internet worked out smoothly. However, no experiment is without possible error. Research assistants mentioned that some participants talked to each other about the reasons of doing so. Although they know this is a part of Ph.D. dissertation, boredom during the experiment might cause result errors. The next possible error is the experiment is conducted in various classes. Positive or negative emotion of participants from different classes can cause result errors. The possible error that can occur in this experiment is its sequence. If the sequence of the cognitive biases was different, the results could become different. However since the researcher did not test the sequencing

effect, this becomes one of the research limitations and this point could be taken into an account for the results interpretation.

The number of participants per scenario is reported in Table 5.1.

TABLE 5.1

NUMBER OF PARTICIPANTS PER SCENARIO

Scenario	Manipulating Condition	Number of Female Participants	Number of Male Participants	Number of Participants
1	Manipulated by the Anchoring Effect, Illusion of Control, and Endowment Effect	34	32	66
2	Manipulated by the Anchoring Effect and Illusion of Control	31	35	66
3	Manipulated by the Anchoring Effect and Endowment Effect	33	31	64
4	Manipulated by the Anchoring Effect	30	32	62
5	Manipulated by the Illusion of Control and Endowment Effect	33	31	64
6	Manipulated by the Illusion of Control	35	32	67
7	Manipulated by the Endowment Effect	35	31	66
8	No Manipulation	35	34	69
Total		266	258	524

The number of participants per scenario ranged between 62 and 69 participants. The scenario with no manipulation has the maximum number of participants, while the scenario manipulated by the endowment effect has the minimum number of participants.

5.2 Descriptive statistics

The mean of the customer satisfaction score ranges between 5.25 and 7.71 out of 10. The standard deviation ranges between 0.99 and 1.34. The no manipulation scenario has the lowest mean (5.25), while the scenario manipulated by the anchoring effect, illusion of control, and endowment effect has the highest mean (7.71).

In the female sample, the mean of the customer satisfaction score ranges between 5.30 and 8.16 out of 10. The standard deviation ranges between 0.80 and 1.37. The no manipulation scenario has the lowest mean (5.30), while the scenario manipulated by the anchoring effect, illusion of control, and endowment effect has the highest mean (8.16).

In the male sample, the mean of the customer satisfaction score ranges between 5.19 and 7.24 out of 10. The standard deviation ranges between 0.89 and 1.21. The no manipulation scenario has the lowest mean (5.19), while the scenario manipulated by the anchoring effect, illusion of control, and endowment effect has the highest mean (7.24).

The descriptive statistics for the customer satisfaction score are reported in Table 5.2.

TABLE 5.2

DESCRIPTIVE STATISTICS FOR THE CUSTOMER SATISFACTION SCORE

	Scenario	Female				Male				Total			
		Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
1	Manipulated by the Anchoring Effect, Illusion of Control, and Endowment Effect	8.16	0.88	6.67	9.67	7.24	0.89	5.33	8.67	7.71	0.99	5.33	9.67
2	Manipulated by the Anchoring Effect and the Illusion of Control	7.61	1.13	5.67	10.00	6.73	1.00	4.67	8.67	7.15	1.14	4.67	10.00
3	Manipulated by the Anchoring Effect and the Endowment Effect	7.69	1.13	5.67	9.67	6.67	1.13	4.67	8.67	7.19	1.24	4.67	9.67
4	Manipulated by the Anchoring Effect	7.00	1.11	4.67	9.00	5.89	1.00	3.33	7.33	6.42	1.19	3.33	9.00
5	Manipulated by the Illusion of Control and the Endowment Effect	7.63	0.80	6.33	9.33	6.81	1.07	4.00	8.33	7.23	1.02	4.00	9.33
6	Manipulated by the Illusion of Control	6.94	1.30	4.33	9.67	6.10	1.07	4.00	7.33	6.54	1.26	4.00	9.67
7	Manipulated by the Endowment Effect	7.15	1.37	4.33	10.00	6.17	1.12	3.67	8.00	6.69	1.34	3.67	10.00
8	No Manipulation	5.30	1.13	3.00	7.67	5.19	1.21	2.33	8.00	5.25	1.17	2.33	8.00

5.3 Manipulation checks results

With respect to the manipulation check question for the anchoring effect *'How many times you think you can sign using a ballpoint pen, on average?',* the mean of the answers in each scenario ranges between 1,328 and 6,015. The standard deviation ranges between 297 and 1,061. The scenario manipulated by the illusion of control and the endowment effect has the lowest mean (1,328), while the scenario manipulated by the anchoring effect, illusion of control, and endowment effect has the highest mean (6,015).

The average of the answers *'How many times you think you can sign using a ballpoint pen, on average?',* for the scenario manipulated by anchoring effect is 5,967.05 times, while the average of the answers for the scenario be not manipulated by anchoring effect is 1,400.75 times. The independent t-test is used to measure difference. It is found that t-statistics is equal 67.780, sig = <0.001 that can summarize that as predicted, the anchoring effect manipulation produced a significant impact on participants.

With respect to the manipulation check question for the illusion of control *'If you make a guess regarding usable or unusable pens for ten times, how many times you think you will guess correctly?'*, the mean of the answer in each scenario ranges between 4.87 and 7.70. The standard deviation ranges between 1.31 and 1.93. The no manipulation scenario has the lowest mean (4.87), while the scenario manipulated by the anchoring effect, illusion of control, and endowment effect has the highest mean (7.70).

The average of the answers *'If you make a guess regarding usable or unusable pens for ten times, how many times you think you will guess correctly?'*, for the scenario manipulated by illusion of control is 7.38 times, while the average of the answers for the scenario be not manipulated by illusion of control is 5.03 times. The independent t-test is used to measure difference. It is found that t-statistics is equal 15.591, sig = <0.001 that can summarize that as predicted, the illusion of control manipulation produced a significant impact on participants.

With regard to the manipulation check question for the endowment effect *'Do you think you own of the pen?'*, the percentage of participants in each scenario that consider themselves owners of the pen ranges between 20.97% and 80.30% The scenario manipulated by the anchoring effect is characterised by the lowest share (20.97%), while the scenario manipulated by the endowment effect features the highest percentage (80.30%).

The percentage of participants consider themselves owners of the pen for the scenario manipulated by endowment effect is 76.92%, while the percentage of participants consider themselves owners of the pen for the scenario not manipulated by endowment effect is 25.38%. The two proportion Z-tests is used to measure difference. It is found that Z-statistics is equal 11.801, sig = <0.001. This can be summarized that as predicted, the endowment effect manipulation produced a significant impact on participants.

The overall descriptive statistics are reported in Table 5.3 and the results of manipulation checks are shown in Table 5.4.

TABLE 5.3

DESCRIPTIVE STATISTICS

	Scenario	Manipulation Check for Anchoring Effect				Manipulation Check for Illusion of Control				Manipulation Check for Endowment Effect		
		Mean	SD	Min	Max	Mean	SD	Min	Max	Yes	No	Percentage
1	Manipulated by the Anchoring Effect, Illusion of Control, and Endowment Effect	6,015	330	4,000	6,700	7.70	1.53	3	10	51	15	77.27
2	Manipulated by the Anchoring Effect and the Illusion of Control	5,992	297	5,000	7,000	7.48	1.71	3	10	18	48	27.27
3	Manipulated by the Anchoring Effect and the Endowment Effect	5,937	530	4,000	7,000	4.89	1.31	1	8	48	16	75.00
4	Manipulated by the Anchoring Effect	5,919	608	4,000	7,000	5.32	1.64	2	9	13	49	20.97
5	Manipulated by the Illusion of Control and the Endowment Effect	1,328	967	100	5,000	7.22	1.81	1	10	48	16	75.00
6	Manipulated by the Illusion of Control	1,400	1,061	100	5,000	7.13	1.91	3	10	17	50	25.37
7	Manipulated by the Endowment Effect	1,392	890	100	4,400	5.06	1.85	1	9	53	13	80.30
8	No Manipulation	1,476	1,000	100	5,000	4.87	1.93	1	9	19	50	27.54

TABLE 5.4

RESULTS OF THE MANIPULATION CHECK

Cognitive biases	Gender	With manipulation	Without manipulation	t-statistics/ Z-statistics
Anchoring Effect *'How many times you think you can sign using a ballpoint pen, on average?'*	**Female**	Mean = 5,906.25 n = 128	Mean = 1,357.25 n = 138	t = 47.306***
	Male	Mean = 6,026.92 n = 130	Mean = 1,447.66 n = 128	t = 50.054***
	Total	Mean = 5,967.05 n = 258	Mean = 1,400.75 n = 266	t = 68.780***
Illusion of Control *'If you make a guess regarding usable or unusable pens for ten times, how many times you think you will guess correctly?'*	**Female**	Mean = 7.39 n = 136	Mean = 5.20 n = 130	t = 10.432***
	Male	Mean = 7.38 n = 127	Mean = 4.86 n = 131	t = 11.565***
	Total	Mean = 7.38 n = 263	Mean = 5.03 n = 261	t = 15.591***
Endowment Effect *'Do you think you own of the pen?'*	**Female**	Yes = 75.37% n = 134	Yes = 26.52% n = 132	Z = 7.970***
	Male	Yes = 78.57% n = 126	Yes = 24.24% n = 132	Z = 8.725**
	Total	Yes = 76.92% n = 260	Yes = 25.38% n = 264	Z = 11.801***

5.4 Hypothesis Testing

5.4.1 Testing the effect of cognitive biases on customer satisfaction

In Chapter three, three research hypotheses were proposed:

H1a: The presence of anchoring effect influences customer satisfaction

H1b: The presence of illusion of control influences customer satisfaction

H1c: The presence of endowment effect influences customer satisfaction

5.4.1.1 Testing the effect of anchoring effect on customer satisfaction

Independent t-test was conducted to test hypotheses 1a. The data from scenario 4 (manipulated by the anchoring effect) and scenario 8 (no manipulation) were used for analysis (131 participants). Independent t-test relies on two main assumptions: normality and homogeneity.

McDaniel and Gates (2013) explain that based on the central limit theorem, in the presence of 30 or more respondents in each subgroup, the group distribution is normal. In this study, each subgroup has 30 or more participants, which guarantees a normal distribution. In addition, the data is tested by the Shapiro-Wilk normality test and is equal to 0.992 (df = 131, sig. = 0.618), implying that the data has a normal distribution.

Hair et al. (2010) also suggest testing the constant variance of the data with the Levene test for homogeneity of variance. The result indicates that F-statistics = 0.171 and sig. = 0.680, which implies that the variance of the dependent variable is equal across groups.

The average of customer satisfaction score of participants who are manipulated by anchoring effect is equal to 6.42. On the other hand, the average of customer satisfaction score of participants who are not manipulated by anchoring effect is equal 5.25. With respect to H1a, a significant and positive impact of the anchoring effect on customer satisfaction is found (t-statistics = 5.730, df = 129, and sig. = 0.000). Figure 5.1 shows that in the group manipulated by the anchoring effect, the customer satisfaction score is higher than the control group.

FIGURE 5.1 CUSTOMER SATISFACTION SCORE OF PARTICIPANTS IN THE MANIPULATED BY ANCHORING EFFECT GROUP AND CONTROL GROUP

The participants of the scenario manipulated by the anchoring effect tend to be more satisfied with their pens. The average satisfaction score of those manipulated by the anchoring effect is 6.42, and 5.25 for those who are not manipulated. The results support the existence of a positive relationship between the anchoring effect and customer satisfaction. Participants in the treatment group (anchoring effect) evaluate their satisfaction with the pen starting with the high value they previously anchored to, even though that value itself is not relevant to satisfaction. In this study, the proposed average value of the number of signatures obtained with one pen is 6,000 times. Participants then adjust the value, and eventually, achieve higher satisfaction than those who are not subjected to the anchoring manipulation, who estimate fewer signatures.

5.4.1.2 Testing the effect of illusion of control on customer satisfaction

Independent t-test was conducted to test hypotheses H1b. The data from scenario 6 (manipulated by the illusion of control) and scenario 8 (no manipulation) were used for analysis (136 participants). Independent t-test relies on two main assumptions: normality and homogeneity.

McDaniel and Gates (2013) explain that based on the central limit theorem, in the presence of 30 or more respondents in each subgroup, the group distribution is normal. In this study, each subgroup has 30 or more participants, which guarantees a normal distribution. In addition, the data is tested by the Shapiro-Wilk normality test and is equal to 0.990 (df = 136, sig. = 0.400), implying that the data has a normal distribution.

Hair et al. (2010) also suggest testing the constant variance of the data with the Levene test for homogeneity of variance. The results indicate that F-statistics = 1.144 and sig. = 0.287, which implies that the variance of the dependent variable is equal across groups.

The average of customer satisfaction score of participants who are manipulated by illusion of control is equal 6.54. On the other hand, the average of customer satisfaction score of participants who are not manipulated by anchoring effect is equal to 5.25. With respect to H1b, a significant and positive impact of the illusion of control on customer satisfaction is found (t-statistics = 6.231, df = 134, and sig. = 0.000). Figure 4.2 shows that in the group manipulated by the illusion of control, the customer satisfaction score is higher than the control group.
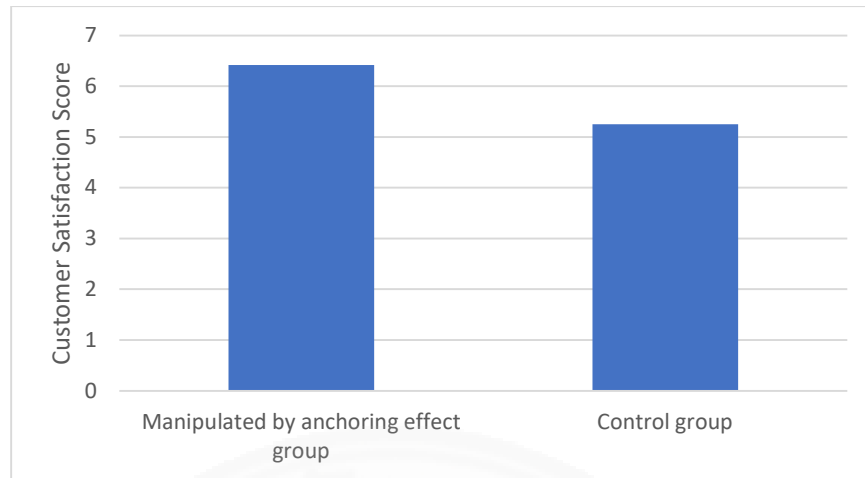

FIGURE 5.2 CUSTOMER SATISFACTION SCORE OF PARTICIPANTS IN THE MANIPULATED BY ILLUSION OF CONTROL GROUP AND CONTROL GROUP

This is a surprising result and contradicts the findings of earlier research (e.g., Ogunnaike & Kehinde, 2011; Roman, 2010). H1b postulates a negative relationship between the illusion of control and satisfaction because those manipulated by an illusion of control tend to have higher expectations of themselves and thus, are less inclined to satisfaction. However, the results of this study indicate the opposite. This result may be attributed to the fact that those manipulated by an illusion of control tend to believe that they can control several aspects of their lives; thus, they experience positive emotions and are more inclined towards satisfaction than those who are not subject to an illusion of control.

5.4.1.3 Testing the effect of endowment effect on customer satisfaction

Independent t-test was conducted to test hypotheses H1c. The data from scenario 6 (manipulated by the endowment effect) and scenario 8 (no manipulation) were used for analysis (135 participants). Independent t-test relies on two main assumptions: normality and homogeneity.

McDaniel and Gates (2013) explain that based on the central limit theorem, in the presence of 30 or more respondents in each subgroup, the group distribution is normal. In this study, each subgroup has 30 or more participants, which guarantees a normal distribution. In addition, the data is tested by the Shapiro-Wilk normality test and is equal to 0.990 (df = 135, sig. = 0.436), implying that the data has a normal distribution.

Hair et al. (2010) also suggest testing the constant variance of the data with the Levene test for homogeneity of variance. The results indicate that F-statistics = 1.571 and sig. = 0.212, which implies that the variance of the dependent variable is equal across groups.

The average of customer satisfaction score of participants who are manipulated by endowment effect is equal 6.69. On the other hand, the average of customer satisfaction score of participants who are not manipulated by endowment effect is equal 5.25. With respect to H1c, a significant and positive impact of the endowment effect on customer satisfaction is found (t-statistics = 6.685, and sig. = 0.000). Figure 5.3 shows that in the group manipulated by the endowment effect, the customer satisfaction score is higher than the control group.
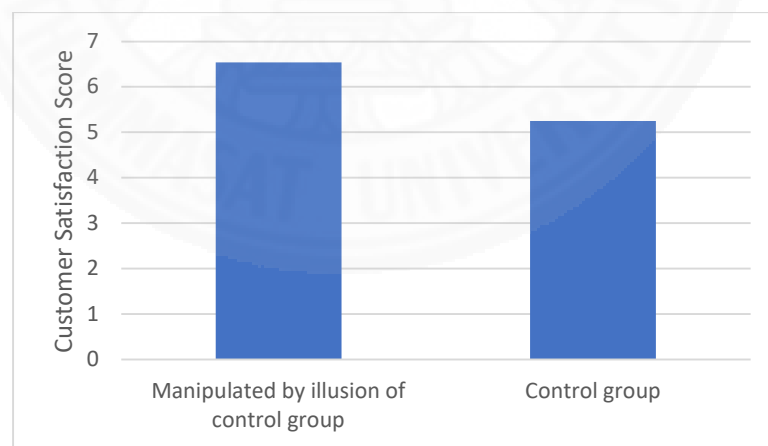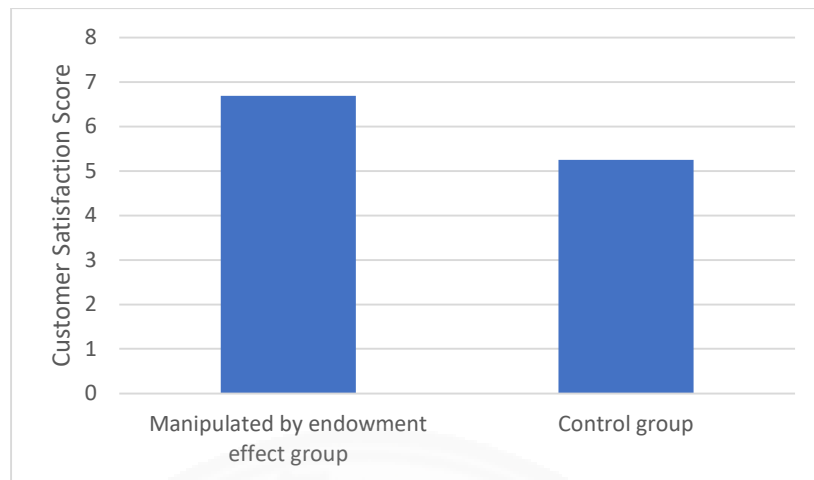
**FIGURE 5.3 CUSTOMER SATISFACTION SCORE OF PARTICIPANTS IN
THE MANIPULATED BY ENDOWMENT EFFECT GROUP
AND CONTROL GROUP**

These results support H1c: those who are told that they own the pen like it more than those who are told that they do not own it. Customers tend to buy products to which they relate emotionally. Thus, customers are drawn towards what they regard highly, as they consume more of the products with which they are familiar. This result supports Yan and Bao (2018), who find that the endowment effect, on average, generates a higher satisfaction rate for households. It also supports Chatterjee, Irmak, and Rose (2013), who contend that people would sell products that they already own for higher price than their market value, which implies higher satisfaction.

With respect to the three aspects of cognitive bias addressed in this study, the size of the average of customer satisfaction score indicates that the endowment effect has the strongest effect on customer satisfaction, followed by the illusion of control and the anchoring effect, in this order.

5.4.2 Testing the moderating effect

Chapter three also proposed the following three moderation hypotheses:

H2a: The relationship between the presence of anchoring effect and customer satisfaction is stronger on female than male.

H2b: The relationship between the presence of illusion of control and customer satisfaction is stronger on female than male.

H2c: The relationship between the presence of endowment effect and customer satisfaction is stronger on female than male.

5.4.2.1 Testing moderation effect of gender on the relationship between anchoring effect and customer satisfaction

The data from scenario 4 (manipulated by the anchoring effect, n = 62) and scenario 8 (no manipulation, n = 69) are used for testing moderation effect of gender on the relationship between anchoring effect and customer satisfaction. Two-way ANOVA is conducted.

As mentioned before, Moore, Notz, and Fligner (2015) suggest testing the constant variance of the data with the Levene test for homogeneity of variance. In this case, the results show that the F-statistics = 0.130 and sig. = 0.942, which imply that variance of the dependent variable is equal across groups. In addition, the normality of the data is tested using the test Shapiro-Wilk, which the test statistics is equal to 0.992 (df = 131, sig. = 0.618), indicating that the data has a normal distribution. Both normality and homogeneity meet the assumptions of the two-way ANOVA approach.

Both the impact of the anchoring effect (F-Statistics = 37.431, sig. = 0.000) and the gender (F-Statistics = 9.927, sig. = 0.002) on customer satisfaction are significant. Moreover, the interaction between the anchoring effect and gender is also significant (F-Statistics = 6.478, sig. = 0.012) and, thus, there is moderation effect of gender on the relationship between anchoring effect and customer satisfaction (Seltman, 2018).

This result is in line with Adenzato et al. (2017), who contend that females score higher on tests of the affective dimension when stimulated by social cognition. In addition, males have a more systematising style than females. Then, when people are manipulated by the anchoring effect, females respond more than males to the affective aspects in terms of customer satisfaction.

Moreover, the interaction plot shows that in the group manipulated by the anchoring effect, the customer satisfaction of females is higher than that of males. In the control group, the customer satisfaction of males and females is similar. Hence, a moderating effect of gender is observed in the relationship between the anchoring effect and customer satisfaction, supporting hypothesis H2a.

Table 5.5 reports the relevant descriptive statistics, Figure 5.4 reports the plot, and Table 5.6 reports the results.

TABLE 5.5

DESCRIPTIVE STATISTICS

		Gender	
		Female	**Male**
Manipulated by the Anchoring Effect	**Yes**	Mean = 7.00 SD = 1.11	Mean = 5.89 SD = 1.00
	No	Mean = 5.30 SD = 1.13	Mean = 5.19 SD = 1.21
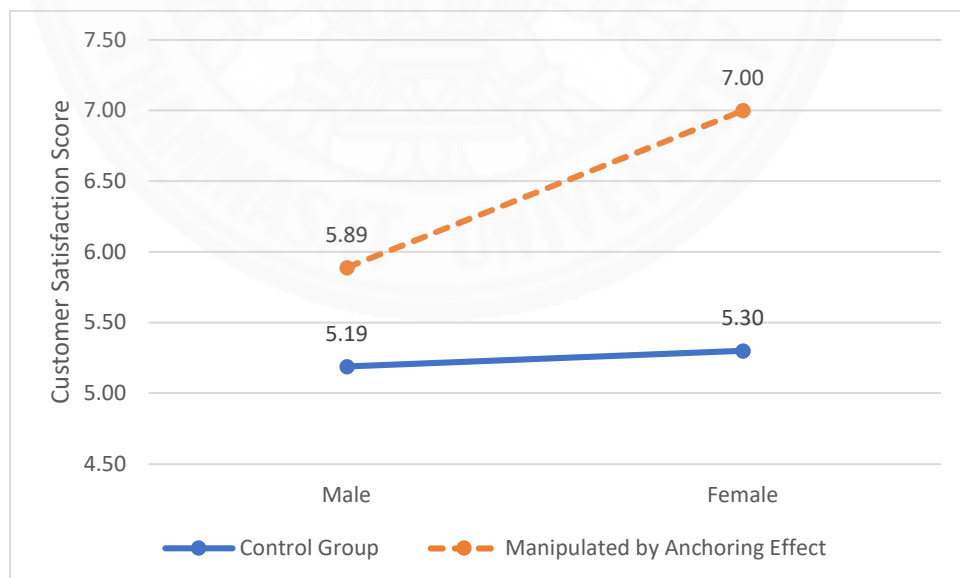
FIGURE 5.4: CUSTOMER SATISFACTION BY GENDER– MANIPULATION THROUGH THE ANCHORING EFFECT

TABLE 5.6

TESTS OF BETWEEN-SUBJECTS EFFECTS

Source	Type III Sum of Squares	df	Mean Square	F-Statistics	sig.
Corrected Model	64.822	3	21.607	17.291	.000
Intercept	4458.465	1	4458.465	3567.786	.000
Anchoring Effect	46.775	1	46.775	37.431	.000
Gender	12.405	1	12.405	9.927	.002
Anchor * Gender	8.095	1	8.095	6.478	.012
Error	158.705	127	1.250		
Total	4636.556	131			
Corrected Total	223.527	130			

a. R Squared = .290 (Adjusted R Squared = .273)

5.4.2.2 Testing moderation effect of gender on the relationship between illusion of control and customer satisfaction

The data from scenario 6 (manipulated by the illusion of control, n = 67) and scenario 8 (no manipulation, n = 69) are used for testing moderation effect of gender on the relationship between illusion of control and customer satisfaction. Two-way ANOVA is conducted.

As mentioned before, Moore, Notz, and Fligner (2015) suggest testing the constant variance of the data with the Levene test for homogeneity of variance. In this case, the results show that the F-statistics = 0.517 and sig. = 0.671, which imply that variance of the dependent variable is equal across groups. In addition, the normality of the data is tested using the test Shapiro-Wilk, which the test statistics is equal to 0.990 (df = 136, sig. = 0.400), indicating that the data has a normal distribution. Both normality and homogeneity meet the assumptions of the two-way ANOVA approach.

Both the impact of the illusion of control (F-Statistics = 39.570 sig. = 0.000) and the gender (F-Statistics = 5.549, sig. = 0.020) on customer satisfaction are significant. However, the interaction between the illusion of control and gender is not significant (F-Statistics = 3.142, sig. = 0.079) and, thus, there is no moderation

effect of gender on the relationship between illusion of control and customer satisfaction (Seltman, 2018).

Alan et al. (2020) find that females are less keen than men on making decisions on behalf of others and less prone to have a position of power in groups. Stets and Burke (1996) find, in line with the identity theory, that males are more dominant than females; thus, when females feel in control, they are expected to feel particularly satisfied. However, the Thai culture is now characterised by substantial equality between genders (Nakavachara, 2010). Thus, gender does not affect the relationship between the illusion of control and customer satisfaction.

Moreover, the interaction plot in Figure 5.5 shows that in the scenario manipulated by the illusion of control group, the customer satisfaction of females is different from that experienced by males, but this difference is not statistically significant. In the control group, the customer satisfaction of females and males is similar. The results suggest that gender does not moderate the relationship between the illusion of control and customer satisfaction; hence, hypothesis H2b is not supported.

Table 5.7 reports the relevant descriptive statistics, Figure 5.5 reports the plot, and Table 5.8 reports the results.

TABLE 5.7

DESCRIPTIVE STATISTICS

		Gender	
		Female	**Male**
Manipulated by the illusion of control	**Yes**	Mean = 6.94 SD = 1.30	Mean = 6.10 SD = 1.07
	No	Mean = 5.30 SD = 1.13	Mean = 5.19 SD = 1.21
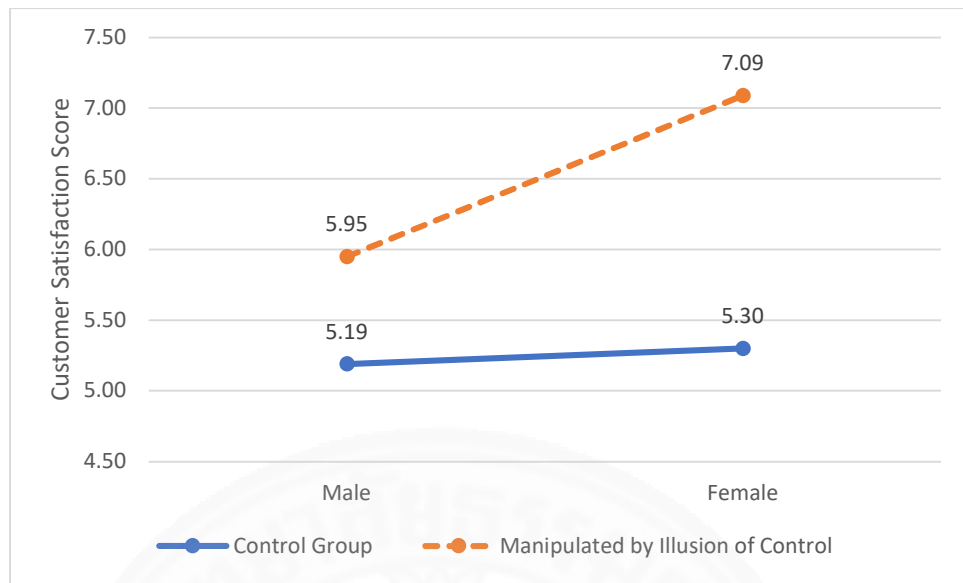
FIGURE 5.5: CUSTOMER SATISFACTION BY GENDER–
MANIPULATION THROUGH THE ILLUSION OF CONTROL

TABLE 5.8

TESTS OF BETWEEN-SUBJECTS EFFECTS

Source	Type III Sum of Squares	df	Mean Square	F-Statistics	sig.
Corrected Model	69.087	3	23.029	16.432	.000
Intercept	4703.044	1	4703.044	3355.742	.000
Illusion	55.457	1	55.457	39.570	.000
Gender	7.777	1	7.777	5.549	.020
Illusion * Gender	4.403	1	4.403	3.142	.079
Error	184.997	132	1.401		
Total	4963.889	136			
Corrected Total	254.084	135			

a. R Squared = .272 (Adjusted R Squared = .255)

5.4.2.3 Testing moderation effect of gender on the relationship between endowment effect and customer satisfaction

The data from scenario 7 (manipulated by the endowment effect, n = 66) and scenario 8 (no manipulation, n = 69) are used for testing moderation effect of gender on the relationship between endowment effect and customer satisfaction. Two-way ANOVA is conducted.

As mentioned before, Moore, Notz, and Fligner (2015) suggest testing the constant variance of the data with the Levene test for homogeneity of variance. In this case, the results show that the F-statistics = 0.805 and sig. = 0.493, which imply that variance of the dependent variable is equal across groups. In addition, the normality of the data is tested using the test Shapiro-Wilk, which test statistics is equal to 0.990 (df = 135, sig. = 0.436), indicating that the data has a normal distribution. Both normality and homogeneity meet the assumptions of the two-way ANOVA approach.

Both the impact of the endowment effect (F-Statistics = 45.691, sig. = 0.000) and the gender (F-Statistics = 6.872, sig. = 0.010) on customer satisfaction are significant. Moreover, the interaction between the endowment effect and gender is also significant (F-Statistics = 4.227, sig. = 0.042) and, thus, there is moderation effect of gender on the relationship between endowment effect and customer satisfaction (Seltman, 2018).

The result is consistent with Adenzato et al. (2017) and is also accordance with the view that females value their belongings more than males do (Rudmin, 1994), implying that females are more satisfied with what they own, on average.

Moreover, the interaction plot in Figure 4.6 shows that in the group manipulated by the endowment effect, the customer satisfaction of females is higher than that of males. In the control group, the customer satisfaction of females is similar to the customer satisfaction of males. Hence, a moderating effect of gender is observed in the relationship between the endowment effect and customer satisfaction, thus supporting hypothesis H2c.

Table 5.9 reports the relevant descriptive statistics, Figure 4.6 reports the plot, and Table 5.10 reports the results.

TABLE 5.9

DESCRIPTIVE STATISTICS

		Gender	
		Female	**Male**
Manipulated by the endowment effect	**Yes**	Mean = 7.15 SD = 1.37	Mean = 6.17 SD = 1.12
	No	Mean = 5.30 SD = 1.13	Mean = 5.19 SD = 1.21
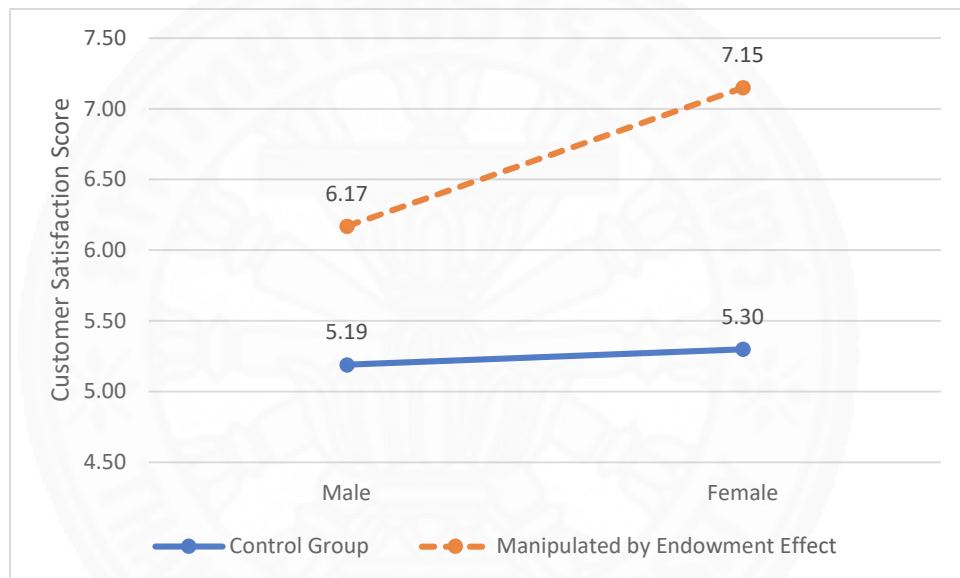
FIGURE 5.6: CUSTOMER SATISFACTION BY GENDER– MANIPULATION THROUGH THE ENDOWMENT EFFECT

TABLE 5.10

TESTS OF BETWEEN-SUBJECTS EFFECTS

Source	Type III Sum of Squares	df	Mean Square	F-Statistics	sig.
Corrected Model	86.530	3	28.843	19.504	.000
Intercept	4773.700	1	4773.700	3228.002	.000
Illusion	67.569	1	67.569	45.691	.000
Gender	10.162	1	10.162	6.872	.010
Illusion * Gender	6.252	1	6.252	4.227	.042
Error	193.728	131	1.479		
Total	5064.556	135			
Corrected Total	280.258	134			

a. R Squared = .309 (Adjusted R Squared = .293)

5.4.3 Testing the interaction effect

Chapter three also proposed four interaction hypotheses:

H3a: The presence of anchoring effect and illusion of control together influence customer satisfaction.

H3b: The presence of anchoring effect and endowment effect together influence customer satisfaction.

H3c: The presence of illusion of control and endowment together influence customer satisfaction.

H3d: The presence of anchoring effect, illusion of control, and endowment effect together influence customer satisfaction.

Four steps are needed for testing the interaction effects. The first step requires testing the impact of the interaction between the anchoring effect and the illusion of control. Second, the impact of the interaction between the anchoring effect and the endowment effect is tested. Then, the impact of the interaction between the illusion of control and the endowment effect is investigated. Last, the impact of the interaction among the anchoring effect, illusion of control, and endowment effect is tested.

5.4.3.1 Interaction between the anchoring effect and the illusion of control

The data from scenario 2 (manipulated by the anchoring effect and the illusion of control, 66 participants), scenario 4 (manipulated by the anchoring effect, 62 participants), scenario 6 (manipulated by the illusion of control, 67 participants), and scenario 8 (no manipulation, 69 participants) are used for testing the impact of the interaction between the anchoring effect and the illusion of control. Two-way ANOVA is conducted.

As mentioned before, Moore, Notz, and Fligner (2015) suggest testing the constant variance of the error term with the Levene test for homogeneity of variance. In this case, the results show that the F-statistics = 0.516 and sig. = 0.672, which imply that the error variance of the dependent variable is equal across groups. In addition, the normality of the error term is tested using the test Shapiro-Wilk, which is equal to 0.995 (df = 264, sig. = 0.585), indicating that the error term has a normal distribution. Both normality and homogeneity meet the assumptions of the two-way ANOVA approach.

Table 5.11 reports the relevant descriptive statistics, and Figure 5.7 reports the interaction plot.

TABLE 5.11
DESCRIPTIVE STATISTICS

		Manipulated by the Illusion of Control	
		Yes	**No**
Manipulated by the Anchoring Effect	**Yes**	Mean = 7.15 SD = 1.14	Mean = 6.42 SD = 1.19
	No	Mean = 6.54 SD = 1.26	Mean = 5.25 SD = 1.17
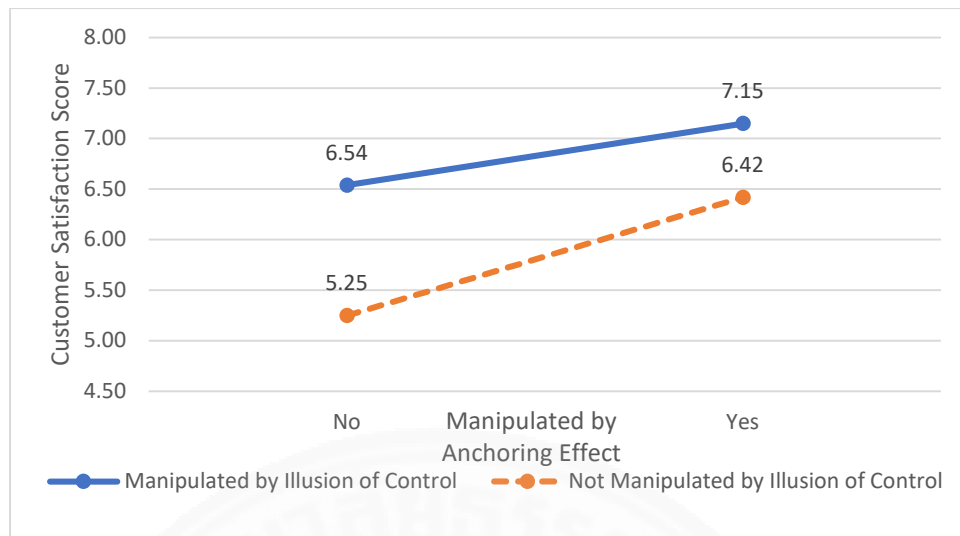
FIGURE 5.7: CUSTOMER SATISFACTION SCORE– MANIPULATON THROUGH THE ANCHORING EFFECT AND THE ILLUSION OF CONTROL

Both the impact of the anchoring effect (F-Statistics = 37.034, sig. = 0.000) and the illusion of control (F-Statistics = 47.448, sig. = 0.000) on customer satisfaction are significant. However, the interaction between the anchoring effect and the illusion of control is not significant (F-Statistics = 3.843, sig. = 0.051) and, thus, has no impact on customer satisfaction (Seltman, 2018).

The results indicate that both the anchoring effect and the illusion of control separately affect customer satisfaction. However, combining the two aspects of cognitive bias together does not affect customer satisfaction.

Table 5.12 reports the results.

TABLE 5.12

TESTS OF BETWEEN-SUBJECTS EFFECTS

Source	Type III Sum of Squares	df	Mean Square	F-Statistics	sig.
Corrected Model	128.593[a]	3	42.864	30.325	.000
Intercept	10595.331	1	10595.331	7495.853	.000
Anchoring Effect	52.347	1	52.347	37.034	.000
Illusion of Control	67.067	1	67.067	47.448	.000
Anchor * Illusion	5.431	1	5.431	3.843	.051
Error	367.508	260	1.413		
Total	11064.333	264			
Corrected Total	496.101	263			

a. R Squared = .259 (Adjusted R Squared = .251)

5.4.3.2 Interaction between the anchoring effect and the endowment effect

The data from scenario 3 (manipulated by the anchoring effect and the endowment effect, 64 participants), scenario 4 (manipulated by the anchoring effect, 62 participants), scenario 7 (manipulated by the endowment effect, 66 participants), and scenario 8 (no manipulation, 69 participants) are used for testing the impact of the interaction between the anchoring effect and the endowment effect. Two-way ANOVA is conducted.

The results of the Levene test for homogeneity of variance show that F-statistics = 0.573 and sig. = 0.633, which imply that the error variance of the dependent variable is equal across groups. In addition, the Shapiro-Wilk test result is equal to 0.994 (df = 261, sig. = 0.359), implying that the error term has a normal distribution. Both normality and homogeneity meet the assumptions of two-way ANOVA.

Table 5.13 reports the relevant descriptive statistics, and Figure 4.8 shows the interaction plot.

TABLE 5.13

DESCRIPTIVE STATISTICS

|		Manipulated by The Endowment Effect	
		Yes	No
Manipulated by The Anchoring Effect	**Yes**	Mean = 7.19 SD = 1.24	Mean = 6.42 SD = 1.19
	No	Mean = 6.69 SD = 1.26	Mean = 5.25 SD = 1.17
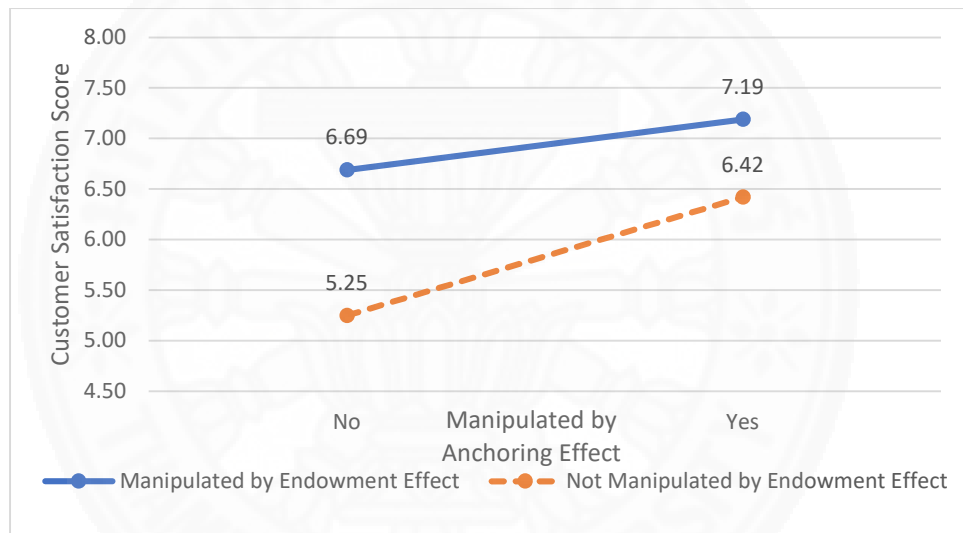
FIGURE 5.8: CUSTOMER SATISFACTION SCORE– MANIPULATION THROUGH THE ANCHORING EFFECT AND THE ENDOWMENT EFFECT

The impact of the anchoring effect (F-Statistics = 30.125, sig. = 0.000) and the endowment effect (F-Statistics = 52.350, sig. = 0.000) on customer satisfaction is significant. Moreover, the interaction between the anchoring effect and the endowment effect is also significant (F-Statistics = 4.905, sig. = 0.028), in line with Seltman (2018).

Table 5.14 reports the results.

Both types of cognitive bias, the anchoring effect and the endowment effect, are similar in terms of attachment. The anchoring effect is a phenomenon according to which people are attached with the value given as a starting point for decision-making, while the endowment effect induces attachment towards what people already own. The combination of these two aspects of cognitive bias significantly affects customer satisfaction.

TABLE 5.14

TESTS OF BETWEEN-SUBJECTS EFFECTS

Source	Type III Sum of Squares	df	Mean Square	F-Statistics	sig.
Corrected Model	137.458	3	45.819	30.058	.000
Intercept	10637.031	1	10637.031	6977.973	.000
Anchoring Effect	45.922	1	45.922	30.125	.000
Endowment Effect	79.801	1	79.801	52.350	.000
Anchor * Endow	7.477	1	7.477	4.905	.028
Error	391.764	257	1.524		
Total	11116.778	261			
Corrected Total	529.222	260			

a. R Squared = .260 (Adjusted R Squared = .251)

5.4.3.3 Interaction between the illusion of control and the endowment effect

The data from scenario 5 (manipulated by the illusion of control and endowment effect, 64 participants), scenario 6 (manipulated by the illusion of control, 67 participants), scenario 7 (manipulated by the endowment effect, 66 participants), and scenario 8 (no manipulation, 69 participants) are used for testing the impact of the interaction between the illusion of control and the endowment effect. Two-way ANOVA is conducted.

The results of the Levene test for homogeneity of variance show that F-statistics = 2.404 and sig. = 0.068, which mean that the error variance of

the dependent variable is equal across groups. In addition, the result of the Shapiro-Wilk test is equal 0.990 (df = 266, sig. = 0.068), meaning that the error term has a normal distribution. Both normality and homogeneity meet the assumptions of two-way ANOVA.

Table 5.15 reports the relevant descriptive statistics, and Figure 5.9 shows the interaction plot.

TABLE 5.15

DESCRIPTIVE STATISTICS

		Manipulated by the Endowment Effect	
		Yes	**No**
Manipulated by the Illusion of Control	**Yes**	Mean = 7.23 SD = 1.02	Mean = 6.54 SD = 1.26
	No	Mean = 6.69 SD = 1.34	Mean = 5.25 SD = 1.17
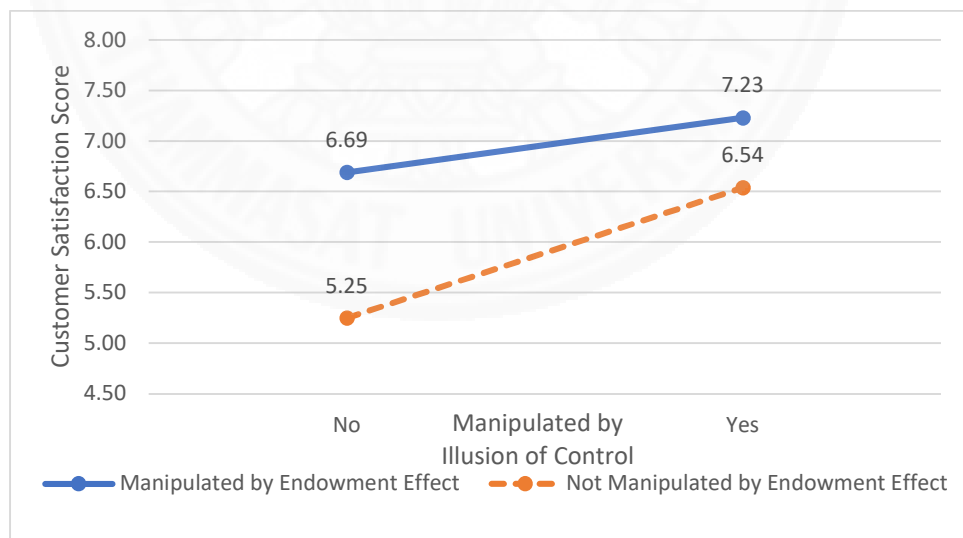
FIGURE 5.9: CUSTOMER SATISFACTION SCORE–
MANIPULATION THROUGH THE ILLUSION OF CONTROL AND
THE ENDOWMENT EFFECT

The impact of the illusion of control (F-Statistics = 38.521, sig. = 0.000) and the endowment effect (F-Statistics = 52.125, sig. = 0.000) on customer satisfaction is significant. Moreover, the interaction between the illusion of control and the endowment effect is also significant (F-Statistics = 6.598, sig. = 0.011), in line with Seltman (2018).

The results are shown in Table 5.16.

Both types of cognitive bias, the illusion of control and the endowment effect, are similar in terms of sense of control. The illusion of control is the situation when people feel more control over something than they have. The endowment effect is the condition when people feel control on their possessions. The combination of these two aspects affects customer satisfaction significantly.

TABLE 5.16

TESTS OF BETWEEN-SUBJECTS EFFECTS

Source	Type III Sum of Squares	df	Mean Square	F-Statistics	sig.
Corrected Model	142.791	3	47.597	32.842	.000
Intercept	10980.899	1	10980.899	7576.918	.000
Anchoring Effect	55.827	1	55.827	38.521	.000
Endowment Effect	75.542	1	75.542	52.125	.000
Anchor * Endow	9.562	1	9.562	6.598	.011
Error	379.705	262	1.449		
Total	11446.889	266			
Corrected Total	522.496	265			

R Squared = .273 (Adjusted R Squared = .265)

5.4.3.4 Interaction among the anchoring effect, illusion of control, and endowment effect

The data from scenario 1 (manipulated by the anchoring effect, illusion of control, and endowment effect, 64 participants), scenario 2 (manipulated by the anchoring effect and the illusion of control, 67 participants), scenario 3 (manipulated by the anchoring effect and the endowment effect 66 participants), scenario 4 (manipulated by the anchoring effect, 64 participants), scenario 5 (manipulated by the illusion of control and the endowment effect, 64 participants), scenario 6 (manipulated by the illusion of control, 64 participants), scenario 7 (manipulated by the endowment effect, 64 participants), and scenario 8 (no manipulation, 69 participants) are used for testing the impact of the interaction among the anchoring effect, illusion of control, and endowment effect. Three-way ANOVA is conducted to test the interaction effect.

Cohen (2008) suggests testing the constant variance of the error term with the Levene test for homogeneity of variance. The results show that F-statistics = 1.498 and sig. = 0.165, which imply that the error variance of the dependent variable is equal across groups. In addition, the result of the Shapiro-Wilk is equal to 0.995 (df = 524, sig. = 0.108), indicating that the error term has a normal distribution. Both normality and homogeneity meet the assumption of three-way ANOVA.

Table 5.17 reports the relevant descriptive statistics, and Figure 5.10 shows the interaction plot.

TABLE 5.17

DESCRIPTIVE STATISTICS

		Manipulation by Endowment Effect			
		Yes		No	
		Manipulation by the illusion of Control		Manipulation by the illusion of Control	
		Yes	No	Yes	No
Manipulation by Anchoring Effect	**Yes**	Mean = 7.71 SD = 0.99	Mean = 7.19 SD = 1.24	Mean = 7.15 SD = 1.14	Mean = 6.42 SD = 1.19
	No	Mean = 7.23 SD = 1.02	Mean = 6.69 SD = 1.34	Mean = 6.54 SD = 1.26	Mean = 5.25 SD = 1.17
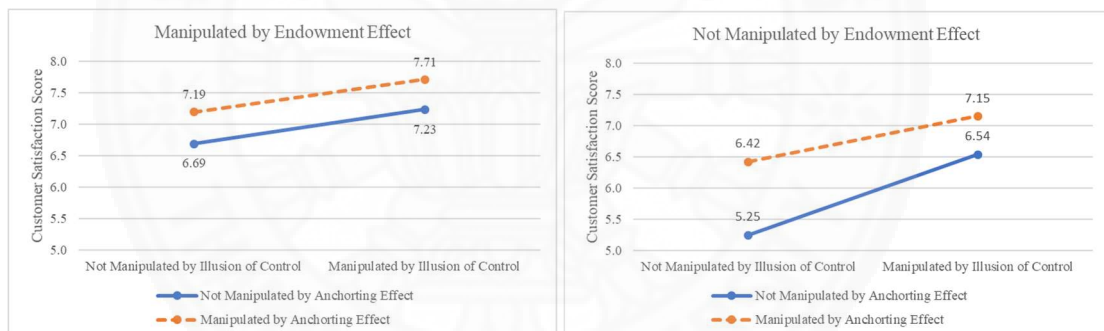
FIGURE 5.10: CUSTOMER SATISFACTION SCORE– MANIPULATION THROUGH THE ANCHORING EFFECT, ILLUSION OF CONTROL, AND ENDOWMENT EFFECT

The impact of the anchoring effect (F-Statistics = 45.467, sig. = 0.000), the illusion of control (F-Statistics = 56.157, sig. = 0.000), and the endowment effect on customer satisfaction is significant (F-Statistics = 71.381, sig. = 0.000).

In addition, the interaction between the anchoring effect and the illusion of control is not significant (F-Statistics = 2.082, sig. = 0.150). In addition, the interaction between the anchoring effect and the endowment effect is also not found

significant (F-Statistics = 3.791, sig. = 0.052). However, the interaction between the illusion of control and the endowment effect is significant (F-Statistics = 5.487, sig. = 0.020). Finally, the interaction among the anchoring effect, illusion of control, and endowment effect is not statistically significant (F-Statistics = 1.839, sig. = 0.176), thus indicating the lack of a significant impact on customer satisfaction.

The results are reported in Table 5.18.

Hoven, Amsel, and Tyano (2019) mentioned that more than one type of cognitive bias can occur in a situation, with a larger impact if they occur in the same direction. Similarly, this study shows that three aspects of cognitive bias, which share a certain similarity, significantly affect customer satisfaction separately. However, when the anchoring effect, illusion of control, and endowment effect are combined together, their impact on customer satisfaction is not significant.

TABLE 5.18

TESTS OF BETWEEN-SUBJECTS EFFECTS

Source	Type III Sum of Squares	df	Mean Square	F-Statistics	sig.
Corrected Model	264.287	7	37.755	27.425	.000
Intercept	24016.830	1	24016.830	17445.406	.000
Anchoring Effect	62.594	1	62.594	45.467	.000
Illusion of Control	77.311	1	77.311	56.157	.000
Endowment Effect	98.269	1	98.269	71.381	.000
Anchor * Illusion	2.867	1	2.867	2.082	.150
Anchor * Endow	5.219	1	5.219	3.791	.052
Illusion * Endow	7.554	1	7.554	5.487	.020
Anchor * Illusion * Endow	2.532	1	2.532	1.839	.176
Error	710.370	516	1.377		
Total	24944.000	524			
Corrected Total	974.656	523			

R Squared = .271 (Adjusted R Squared = .261)

5.5 Chapter summary

All aspects of cognitive bias addressed in this study have a positive relationship with customer satisfaction when manipulated separately. In addition, a moderating effect of gender is observed in the relationship between each facet of cognitive bias and customer satisfaction except illusion of control. When two aspects of the bias are combined, only the interaction between the anchoring effect and the illusion of control has no significant effect. However, the interaction among the anchoring effect, illusion of control, and endowment is found to have no impact on customer satisfaction. Table 5.19 summarises the hypothesis testing results.

TABLE 5.19
RESEARCH HYPOTHESES AND RESULTS

	Hypotheses	Result
H1a	The presence of anchoring effect influences customer satisfaction	Positively significant
H1b	The presence of illusion of control influences customer satisfaction	Positively significant
H1c	The presence of endowment effect influences customer satisfaction	Positively significant
H2a	The relationship between the presence of anchoring effect and customer satisfaction is stronger on female than male.	Significant
H2b	The relationship between the presence of illusion of control and customer satisfaction is stronger on female than male.	Not significant
H2c	The relationship between the presence of endowment effect and customer satisfaction is stronger on female than male.	Significant
H3a	The presence of anchoring effect and illusion of control together influence customer satisfaction.	Not significant

Hypotheses		Result
H3b	The presence of anchoring effect and endowment effect together influence customer satisfaction	Significant
H3c	The presence of illusion of control and endowment effect together influence customer satisfaction.	Significant
H3d	The presence of anchoring effect, illusion of control, and endowment effect together influence customer satisfaction.	No impact
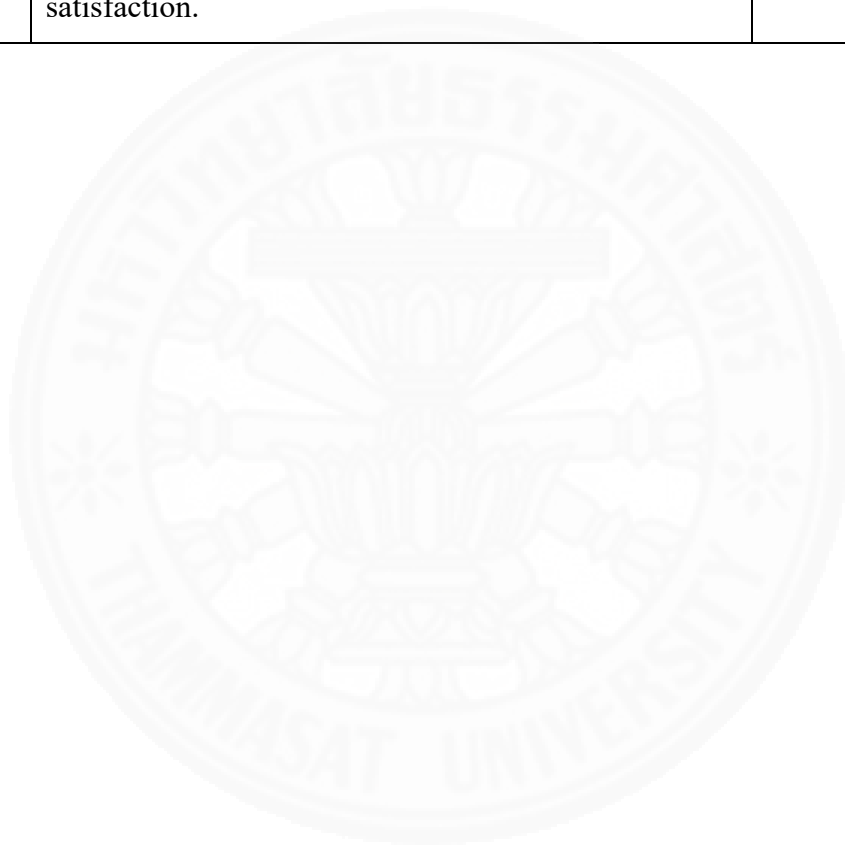
CHAPTER 6
CONCLUSIONS AND RECOMMENDATIONS

6.1 Discussion and conclusions

Previous research on cognitive bias and customer satisfaction mostly addresses the influence of each aspect of cognitive bias on customer satisfaction separately. To the best of my knowledge, no research addresses the relationship between various facets of cognitive bias and customer satisfaction simultaneously. This study investigates three aspects of cognitive bias: the anchoring effect, the illusion of control, and the endowment effect. Then, an experimental design with eight scenarios is tested both separately and simultaneously.

The results show that participants manipulated by the anchoring effect tend to be more satisfied with their pens than those who are not. When participants in the treatment group (anchoring effect) evaluate their satisfaction with the pen, they tend to start with the high value they previously anchored to, even though the value itself is not relevant to their satisfaction. They then adjust the value and eventually experience higher satisfaction than those who are not subject to the anchoring manipulation.

For illusion of control, the result does not support the hypotheses. The illusion of control positively affects customer satisfaction. Participants with an illusion of control tend to believe that they can control various aspects of their lives; thus, they experience positive emotions and are more satisfied than those not experiencing the illusion of control.

Those who are told that they own the pen like it more than those told that they do not own it. Customers normally buy products that they relate to emotionally. Thus, they are drawn towards what they regard highly and consume more of the familiar products. This result supports Yan and Bao (2018) and Chatterjee, Irmak, and Rose (2013).

A moderating effect of gender is observed in the relationship between the anchoring effect and customer satisfaction. This result is in line with Adenzato et al. (2017), who show that females score higher on tests of the affective dimension when

stimulated by social cognition. In addition, males have a more systematising style than females. Hence, when people are manipulated by the anchoring effect, which is expressed in terms of numbers and is generally accepted as systematic, females are expected to respond more than males to the affective component in terms of customer satisfaction.

No moderating effect of gender is observed in the relationship between the illusion of control and customer satisfaction. This result may reflect the equality between genders that characterises the Thai culture.

A moderating effect of gender is observed in the relationship between the endowment effect and customer satisfaction. This result supports the view that females preserve their belongings more than males, implying that females are more satisfied with their possessions.

In the scenario manipulated by both the anchoring effect and the illusion of control, the interaction between the two does not have a significant impact on customer satisfaction. Customers who exhibit one type of cognitive bias do not necessarily show a propensity for other aspects of the bias. The presence of one aspect of bias is often negatively correlated with other facets of the bias (Chen et al., 2007). The presence of more than one type of cognitive bias does not necessarily increase customer satisfaction.

In the scenario manipulated by the anchoring effect and the endowment effect, the interaction between the two has a significant effect on customer satisfaction. In addition, in the scenario manipulated by the illusion of control and the endowment effect, the interaction between the two has a significant impact on customer satisfaction.

Last, the interaction among the anchoring effect, illusion of control, and endowment does not have a significant impact on customer satisfaction. Customers who exhibit one type of bias do not necessarily show a propensity for other facets of the bias. The presence of a type of bias is negatively correlated with other aspects of the bias (Chen et al., 2007). The presence of more than one type of cognitive bias does not necessarily increase customer satisfaction.

The next section discusses this study's theoretical contribution.

6.2 Theoretical contribution

This study extends the body of knowledge on the theory of mind, cognitive bias, and customer satisfaction.

The results of this study provide several theoretical contributions. This study empirically tests the effect of cognitive bias on customer satisfaction, finding a significant relationship. Based on the theory of mind, which contends that the cognitive stage is a precondition of the affective stage of mind, the results of this study confirm this contention, showing that cognitive bias (cognitive stage) affects customer satisfaction (affective stage). In addition, the study explores each type of cognitive bias, namely, heuristic bias (using the anchoring effect), overconfidence bias (using the illusion of control), and choice bias (using the endowment effect). All concerned facets of cognitive bias are found to positively affect customer satisfaction. Hence, this study confirms the theoretical and empirical validity of the theory of mind by showing that the cognitive stage is a prerequisite of the affective stage.

As mentioned above, Adenzato et al. (2017), based on theory of mind, argue that females score higher on tests of the affective dimension than males when stimulated by cognition. In some cases, the results of this study confirm this contention, confirming the moderation effect of gender on heuristic bias (anchoring effect) and customer satisfaction (affective stage). A moderation effect of gender is also observed on choice bias (endowment effect) and customer satisfaction (affective stage). This study finds that in the case of overconfidence bias, represented by the illusion of control (cognitive stage), no moderation effect of gender is observed on customer satisfaction (affective stage). With respect to the anchoring effect and the endowment effect, which represent the heuristic bias and choice bias, respectively, the cognitive state has a significant effect on the affective stage for both genders, but the effect is stronger for females. The heuristic bias and choice bias are similar in terms of attachment. Females consider more and are more attached to their belongings, probably because they are more emotional than males. This result indicates that the relationship between the cognitive state and affective state is stronger for females. In addition, the results show that confidence is the root of overconfidence bias. Since equality and confidence are similar between males and females, acquiring control on something may not lead to more satisfaction

in females than males. This finding challenges the current understanding of the theory of mind. Results from this study partially confirm the theory by showing that the females score higher on tests of the affective dimension than males when stimulated by similar cognition.

Last, this study addresses the impact of the interaction between various aspects of cognitive bias on customer satisfaction. Based on theory of mind, Weed et al. (2010) explain that more than one cognitive mechanism can have an impact on affective mechanisms. Thus, the interaction between cognitive states is expected to have a significant effect on affective states. This study finds that to achieve this result, the different types of cognitive bias must be similar to some extent. For instance, the anchoring effect and the endowment effect are similar in terms of attachment, while the illusion of control and the endowment effect are similar in the sense of control. Since the anchoring effect and the illusion of control are not similar, no significant impact of their interaction on cognitive bias is observed. These findings challenge the theory of mind, indicating that only cognitions that are similar to some extent significantly affect customer satisfaction. This finding is also confirmed by the finding of Meyer and Kunreuther (2017) in disaster context. They explained the reason of people behavior in disaster. Myopia bias (focus on present) and amnesia bias (focus on recent experience) can occur simultaneously. Both biases share similar extent in safety. People, who may be rational in normal situation, would decide based on their affection and safety despite what the government might announce. In marketing context, this is an expansion of the theory of mind. Thus, the novel contribution is the integration of existing theoretical and empirical results to construct a novel concept in marketing context.

6.3 Managerial implications

This study shows that cognitive bias plays a major role in customer satisfaction. Companies can utilise this knowledge to enhance customer satisfaction. The fact that the anchoring effect is positively related to customer satisfaction may help develop an effective marketing strategy. Marketers can use the anchoring bias to influence buyers' decisions in various ways, for example, by setting a higher anchor value for their products, which may or may not be related to the quality of the product. This strategy will eventually lead to an anchoring effect and improve customer satisfaction.

Knowing that the illusion of control is positively related to customer satisfaction, marketers can instil the impression that customers are in control of any transaction. This strategy would help reduce the negative sentiment associated with the lack of control. For instance, positive sentiments could be generated if an organisation allows customers to make choices or applies filters that allow them to control the search phase of the purchasing process. The more control over particular elements the organisation gives to customers, the more the organisation creates a positive perception of control and promotes satisfaction.

Knowing that the endowment effect has a positive impact on customer satisfaction, marketers can use the endowment effect to boost marketing campaign strategies such as giveaways, free trials, accounts and personalisation, freemium versions or by offering new features for premium customers. The endowment effect occurs when customers feel that they own a product, leading them to assign a higher value to perceived ownership, increasing customer satisfaction.

The study's results indicate that a moderation effect of gender exists in the relationship between cognitive bias on customer satisfaction. In particular, the relationship between the anchoring effect and the endowment effect is moderated by gender. Hence, marketers can target their response to each gender. For example, considering their limited budget and intention to manipulate customers, marketers should conduct marketing campaigns specifically targeting, for instance, females.

Last, in some cases, the interaction among the anchoring effect, illusion of control, and endowment effect has a significant impact on customer satisfaction. Since cognitive bias can occur through more than one type of bias simultaneously, marketers can manipulate one or more types of bias to increase their customers' satisfaction. The interactions between the anchoring effect and the endowment effect and between the illusion of control and the endowment effect have a significant impact on customer satisfaction. Marketers can use these findings as strategic tools for achieving profitability. For instance, marketers generally conduct campaigns that exploit cognitive bias by providing information based on high numbers, flattering their customers' relevant knowledge of the product, and giving away trial products. This study's results show that marketers should implement marketing campaigns based on the simultaneous use of various types of cognitive bias.

6.4 Limitations of research

This study suffered some limitations.

First, the results of the study only focus on the anchoring effect, the illusion of control, and the endowment effect, which represent three types of cognitive bias: heuristic, overconfidence, and choice bias, respectively. Thus, the results cannot be generalised to other types of cognitive bias. More experiments are needed to prove that all aspects of heuristic, overconfidence, or choice bias affect satisfaction.

Second, the study's participants are university students. With an insufficient diverse types of participants, the results cannot be generalised to the larger population.

Third, the object used in this study is a pen, which has a low value. The results may change when considering an object with a high value. In addition, when using service as object, the result may also change.

Fourth, gender is used as the moderating variables in this study. However, other moderating variables, such as hedonic/utilitarian values, age, or preference should be considered.

Fifth, the experimental design in this research did not check the primacy effect and recency effect. These are some of the limitations of this research. The results obtained in this study need to be carefully used.

6.5 Recommended future research

The current research examines the effect of cognitive biases (anchoring effect, illusion of control and endowment effect) on customer satisfaction. However, this research can be further extended in several ways.

First, future studies can verify whether the results hold for other groups of people, thus generalising the findings of the current study to a broader population.

Next, future research is needed to understand whether the anchoring effect, the illusion of control, or endowment effect on customer satisfaction can be generalised to other products or services (for example, other commodity products, convenience products, nice products, basic services, or luxury services).

Lastly, since this research is selected only three cognitive biases: anchoring effect, illusion of control, and endowment effect. There are more than one hundred cognitive biases discovered. To broaden the knowledge about cognitive biases and customer satisfaction, other cognitive biases can also be tested.

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APPENDICES

APPENDIX A

ENGLISH VERSION OF QUESTIONNAIRE

Please answer these questions after experimenter ask

1. How many times you think you can sign using a ballpoint pen, on average? ……

2. If you make a guess regarding usable or unusable pens for ten times, how many times you think you will guess correctly? ....

3. Do you think you own of the pen? (Yes/No) ……………………………

4. How satisfied or dissatisfied are you with this pen?

1	2	3	4	5	6	7	8	9	10

very dissatisfied   very satisfied

5. To what extent this pen meets your expectations?

1	2	3	4	5	6	7	8	9	10

not at all   totally

6. Try to imagine a pen that is perfect in every aspect. How near or far from this ideal you find this pen?

1	2	3	4	5	6	7	8	9	10

very far from   cannot get any closer

7. Have you ever seen the pen you received before (Yes/No) ………………….

APPENDIX B
THAI VERSION OF QUESTIONNAIRE

ขอให้ผู้ตอบแบบสอบถาม โปรดตอบแบบสอบถามตามคำแนะนำของเจ้าหน้าที่ควบคุมการทดลอง

ข้อ 1) ท่านคิดว่าปากกาลูกลื่น 1 ด้าม สามารถใช้เซ็นชื่อได้ทั้งหมดกี่ครั้ง

    <u>**ตอบ**</u> [................] ครั้ง

ข้อ 2) หากมีรูปภาพปากกา 2 ด้ามให้ท่านเลือก โดยหนึ่งด้ามสามารถ**ใช้งานได้** แต่อีกหนึ่งด้าม**ใช้งานไม่ได้** ซึ่ง
ท่านจะต้องเลือกด้ามใดด้ามหนึ่ง เป็นจำนวน 10 ครั้ง ท่านคิดว่าท่านจะเลือกปากกาด้ามที่ใช้งานได้ ได้ถูกต้องกี่
ครั้ง

    <u>**ตอบ**</u> [................] ครั้ง

ข้อ 3) ท่านคิดว่าท่านเป็นเจ้าของปากกาด้ามที่อยู่ในมือของท่าน ณ ขณะนี้หรือไม่

    <u>**ตอบ**</u> [......] เป็น   [......] ไม่เป็น

ข้อ 4) ท่านรู้สึกพึงพอใจต่อปากกาด้ามที่อยู่ในของท่านในระดับใด *(1 ไม่พึงพอใจที่สุด – 10 พึงพอใจที่สุด)*

1	2	3	4	5	6	7	8	9	10

ไม่พึงพอใจที่สุด   *พึงพอใจที่สุด*

ข้อ 5) ปากกาด้ามที่อยู่ในมือของท่าน เป็นไปตามที่ท่านคาดหวังในระดับใด *(1 ไม่เป็นไปตามคาดหวังที่สุด -
10 เป็นไปตามคาดหวังที่สุด)*

1	2	3	4	5	6	7	8	9	10

ไม่เป็นตามความคาดหวังที่สุด   *เป็นตามความคาดหวังที่สุด*

ข้อ 6) เมื่อนึกถึงปากกาที่ดีที่สุดในมุมมองของท่าน ท่านคิดว่าปากกาในมือของท่าน ณ ขณะนี้อยู่ใกล้หรือ
ไกลจากปากกาที่ดีที่สุดในมุมมองของท่าน *(1 ห่างไกลมากที่สุด - 10 ใกล้เคียงมากที่สุด)*

1	2	3	4	5	6	7	8	9	10

ห่างไกลมากที่สุด   *ใกล้เคียงมากที่สุด*

ข้อ 7) ท่านเคยเห็นปากกาแบบเดียวกับปากกาที่อยู่ในมือของท่านมาก่อนหรือไม่

    <u>**ตอบ**</u> [......] เคย   [......] ไม่เคย

BIOGRAPHY

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Educational Attainment	2001: Bachelor of Accountancy (Accounting)
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