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Superstitious placebo illusion : does luck charm really gives you luck? It's mere possession does!

Pik Ying CHAN

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SUPERSTITIOUS PRECEBO ILLUSION: DOES LUCK CHARM REALLY
GIVES YOU LUCK? IT'S MERE POSSESSION DOES!

by
CHAN Pik Ying

A thesis
submitted in partial fulfillment
of the requirements for the Bachelor of
Social Sciences (Honours)

Supervisor: Professor YEUNG Wai Lan, Victoria

Lingnan University

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Chapter 1: Introduction

1.1 Background

Superstition is quite common in the modern society, people still hold superstitious beliefs and often engage in superstitious rituals that bring good luck. For example, Feng shui is the most popular superstition among Chinese and carrying a Feng shui luck charm such as mystic knot and red envelopes was believed to bring good luck. Likewise, in Western superstition, similar astrological talismans are believed to strengthen different qualities of the possessor. When one believes that certain object carried mystical power, having possession of it would grant the owner access to those powers. Nonetheless, the mystic power of these talismans is questionable and many believed it to be a placebo effect, in which the beneficial change is assumed result from one's belief or expectation of certain treatment, or any other objects. Based on the prevalent belief on the effectiveness of superstitious luck charm, more investigations concerning this illusion should be made.

In addition, concerning the placebo effect, recent evidence suggests a new approach to understand placebo effect, in which the illusory feeling of benefit might occur once people merely possess the object, even before using it, which is called the precebo effect. To shed light on this precebo illusion, the present study seeks to demonstrate the precebo illusion of superstitious luck charm.

1.2 Objectives and Significance of the study

This study aims to demonstrate the precebo illusion through superstitious rituals. In order to extend our understanding on it, this study was designed to first validate the existence of superstitious precebo illusion by experimental investigation, then

identify its underlying mechanism, finally, to explore what would moderate the strength of this illusory feeling of benefit.

This research can contribute to people's understanding on the precebo illusion, and to explore the possibility that the precebo illusion is a precursor of the placebo effect. Moreover, it is also significant in the practical perspective as it can assist in understanding consumer behavior on consuming superstitious-related products and evaluating the effectiveness of associated marketing strategy.

1.3 Organization of the thesis

This thesis consists of six chapters. In Chapter two, literature review gives an overview on the current knowledge of theoretical background of the superstitious precebo illusion. Chapter three presents the research hypotheses. Chapter four is concerned with the methodology used for this study. Chapter five reports the findings of this research, which aims to validate the existence of superstitious precebo illusion. At last, the final chapter analyses the result and includes discussion of the findings, theoretical and practical implications, and also the limitations and suggestion of future research direction.

Chapter 2: Literature Review

This chapter reviews literature on the theoretical background of the superstitious precebo illusion and also the related underlying mechanism and variables, including dispositional traits, luck-related variables.

2.1 Superstitious rituals and luck charm

Superstition is common in the modern society, people still engage in superstitious beliefs and rituals such as knocking on wood, consider red as an auspicious color, or carrying a luck charm (Wiseman & Watt, 2004). Though superstition can occur in different forms, and in both positive and negative aspects, it can be defined as irrational beliefs that certain object or action might influence the likelihood of an event not based on logic (Damisch, Stoberock & Mussweiler, 2010). It is common for people to use superstitious-related rituals, such as luck charms under uncertain or difficult conditions. Rudski and Edwards (2007) found that college students were more likely to rely on superstitious ritual when they have low perceived skill on the tasks as the use of rituals can provide them an illusion of control for uncertain conditions. Moreover, similar rituals can be easily found among professional athletes. For example, Michael Jordan, the former famous basketball player, used to wear his lucky blue shorts from college under his NBA team uniform for good luck.

Though it might be illusionary, good luck-associated superstitious luck charms were found to improve persistence through enhancing self-perceived efficacy. The research of Damisch et.al. (2010) shows that participants who were in the presence of

a personal luck charm would set higher goal for the tasks assigned. Nevertheless, prior research on superstitious rituals mainly focused on the use of personal luck charm that an individual has possessed personally for a long period, but what if the luck charm were newly presented, will it affect the individuals' belief? It is important to examine the influence of superstitious rituals under different conditions and how its effects work.

2.2 The Placebo Effect and its underlying mechanism

The placebo effect is a fascinating phenomenon that demonstrates how powerful is our minds in shaping our perception of reality, and it has been studied in the medical field for half a century. It occurs when patients experience perceived or actual improvement when they were given a placebo treatment which has no pharmacological effect (Beecher, 1955).

Moreover, the placebo effect has also received much attention in other fields such as marketing. Some products were advertised exaggeratedly and claimed to have certain properties that do not exist, but still consumers are reported to experience beneficial effects. For instance, a brand of hologram bracelet named Power Balance, which was used by numerous NBA players including Jeremy Lin, was alleged to have the effects of enhancing athlete's strength and sport performance, but later was found to be a placebo effect (Wilson, 2011). Thus, it is important to examine the placebo effect of marketing actions and how its effects work.

Precebo effect

Previous researches have investigated the underlying mechanisms that drive the placebo effect. Nonetheless, they only focus on investigating the placebo effect after people using/ consuming the products, but do not examine the possibility that this illusory feeling of benefit may occur at the time when people merely possessing the products, even before usage. Yeung & colleagues (2013) is amongst the first to document this illusory feeling, which is called the precebo illusion. It is suggested that people might feel benefited from the product, by merely possessing it, even before they actually use it. For instance, students reported greater perceived knowledge gained through the possession of lectures notes, even before they read the notes.

Quality Transference Mechanism

Quality Transference is proposed to be one mechanism that driven the precebo effect. Past research indicated that people view an object more favorably when they have ownership on it (Nesselroade, Beggan, & Allison, 1999; Huang, Wang & Shi, 2009), and they would overemphasize the control the possessions give them to compensate for a perceived loss of control (Beggan, 1991), and served as an attempt for self-enhancement (Beggan, 1992). The present study suggests that with mere possession, precebo effect can be demonstrated when people regard their possessions as part of themselves and perceived it as a means to compensate for a loss of control, the positive qualities of an object would transfer to the possessor to enhance themselves.

Motivational Factors and Goal Activation

It is expected that placebo effect will only occur when the instrumental value of a product is congruent with one's motive. Motivational concordance is suggested to be one important model to predict placebo responding (Hyland, 2011), if one's motive matches with the instrumental value of a product or ritual and with high expectancy on it, the illusionary feeling of benefit would occur. Oppositely, if there is mismatch between one's motive and the value of a product, it is possible that the illusory of benefit would not occur. Irmak, Block, & Fitzsimo(2005) demonstrated that the placebo effect manifests only for people who desire the arousing effects of a product.

Moreover, it is suggested that placebo effect is driven by goal activation. Placebo expectations become more likely to take effects when people held a placebo-compatible goal, even it is temporary-activated (Geers, Weiland, Kosbab, Landry & Helfer, 2005). The present study would explore the differences of placebo illusion by manipulating the motive of participants and the instrumental value of the products.

2.3 Superstitious placebo illusion

The present study intends to demonstrate the placebo effect through superstitious ritual (object), which has the quality of bringing luck, i.e. a luck charm.

It is hypothesized that quality transference can be the underlying mechanism that drive placebo effect. Whilst past study shown that people believe good luck is an essence that is attached to the self or object, which is highly transferable (Wohl &

Enzle, 2002) and can be removed through physical cleansings (Xu, Zwick & Schwarz, 2012). Interestingly, similar with placebo effect, when people were presented with good luck charms, performance benefits are demonstrated in cognitive tasks (Damisch et. al., 2010). It is shown that good luck acquire the characteristics of high transferability and is able to demonstrate the placebo effect. Thus, the present study aims to investigate the precebo effect and its underlying mechanisms through the use of superstitious luck-enhancing object.

2.4 The Roles of Dispositional traits

Apart from demonstrating the existence of precebo illusion and investigating its underlying psychological mechanism, the present study also intends to identify the dispositional factors that possibly drive the precebo effect. Specific dispositional traits may be associated with the strength of precebo response, such as those that would affect person's expectation regarding products' benefits. Drawing from prior work, few personality variables were found to predict people's response.

Dispositional Optimism

Dispositional optimism is found related to placebo responding (Geers, Kosbab, Helfer, Weiland, & Wellman, 2007), optimistic individuals reported greater benefits from engaging in a placebo sleep treatment than pessimistic individuals. It is hypothesized that optimists are dispositionally tend to believe positive events are likely to occur and would respond more to their expectations for positive precebo effects.

Negotiable fate, Agency and Fatalism

Negotiable fate means one can be negotiable with fate for control, by exercising personal agency action within the limits that fate has been determined (Chaturvedi, Chi & Viswanathan, 2009). Au, Chiu, Chaturvedi, Mallorie, Viswanathan, Zhang & Savani (2011) report that individuals who strongly believe in negotiable fate are more likely to align themselves with luck. In addition, they tend to engage in active coping, it is suggested that they would pay more attention to feelings or signs of luck that brought by luck –enhancing rituals. Nevertheless, negotiable fate and fatalism are distinct constructs in which fatalism is associated with avoidant coping (Au, Chiu, Zhang, Mallorie, Chaturvedi, Viswanathan & Savani (2012). Thus, people believe in fatalism seems to be not susceptible to the superstitious precebo illusion.

Desire for Control

One's desire for control also play a role in placebo response, variations in the desire for control would moderate the effects of placebo treatment choice (Geers, Rose, Fowler, Rasinski, Brown, & Helfer, 2013). Past study also shows its link with superstitious behaviour. Consumer preferences for lucky products, which associate with positive outcome, increases with higher levels of desire for control (Hamerman & Johar, 2013). An illusion of control could form through consuming lucky products and it is perceived to be a strategy in achieving desired outcome. Therefore, the level of desire for control is expected to be related to the precebo illusion over lucky products.

Spirituality

Spirituality, the tendency of spiritual belief and practices, is found to be a predictor of perceived benefit engaging in placebo therapy, when it is contextualized as spiritual therapy (Hyland & Whalley, 2008). When therapies were contextualized as less-spiritual therapy, they were perceived as less effective. Similarly, it is expected to find linkage between spirituality and placebo responding in possessing luck charm (a spiritual ritual).

Suggestibility

Suggestibility is found to be significantly contributing to the placebo effect. Highly suggestible subjects reported significant pain intensity reductions under the treatment of placebo analgesia, when compared with subject scored lower in suggestibility (De Pascalis, Chiaradia, & Carotenuto, 2002). People who are highly suggestible are more inclined to accept suggestion and prone to placebo response.

2.5 The Roles of other factors

Anticipated benefit

The luck placebo illusion is believed to be affected by one's anticipation benefit from the rituals. Past research has hypothesized that expectancies on the benefits of spiritual therapies can affect people's placebo responses (Hyland & Whalley, 2008). When one's anticipation on the benefit of products is low, it is unlikely for placebo illusion to occur.

Current view of ritual

Though the present study aims to demonstrate the placebo effect before any usage of product, it is still important to examine people's immediate view on the rituals, including the likelihood of people's future behavioral engagement, such as the possibility of future usage and the perceived ease of rituals. Hyland & Whalley (2008) argued that behavioral engagement, including compliance and ease of ritual, can predict placebo responding. They suggested that the perceived easiness of ritual could be an important factor for long-term placebo effects. Thus, the present study also measures one's current view of ritual(bracelet), including one's perceived control of luck/ empowerment, perceived control of bracelet, intention to use the bracelet, imagined consumption and reward responsiveness.

Chapter 3: Hypotheses

This chapter introduces the hypotheses of this research and provides rationale on it. Based on the review of previous studies introduced in Chapter 2, the following hypotheses are proposed.

3.1 Superstitious precebo illusion

To reiterate, the present study aims to demonstrate the precebo effect of superstitious ritual (object). It is hypothesized that mere possession of a luck-enhancing item can induce a superstitious precebo illusion of luck when the instrumental value of the lucky product match with one's goal, even before usage.

The present study assumed that certain contextual activations are prerequisite of the precebo illusion based on the extant literature, in which experimental manipulation is needed. As past research suggested goal activation is important in predicting illusory benefit (Geers, et. Al., 2005). Participants were first manipulated to hold a precebo-compatible goal, in which they are motivated to acquire luck.

Moreover, it is proposed that precebo effect is driven by the Quality Transference mechanism. Through manipulation, participants would either be presented with a bracelet that acquire the quality (luck-enhancing) and feature (matched zodiac sign) that matched with one's identity, in which the positive qualities endowed by the bracelet can be transferred to the possessor to achieve one's goal (improving luck), which is the Possession-Matched condition (P_m); or be presented with a bracelet that acquire the quality (luck-enhancing), but its feature do not match with one's personal identity (mismatched zodiac sign), in which the

positive qualities endowed by the bracelet cannot be transferred to achieve one's goal. Among the latter group, half of them would have possession on the bracelet, which is the Possession-Mismatched condition (P_{mm}) and half of them have no possession on it, which is the Non-possession condition (NP). (Please see Chapter 4 for details)

It is hypothesized that superstitious placebo illusion will occur only when the instrumental value of the possession match with one's motive. Thus, it suggests only participants in P_m condition would experience such an illusion.

In this study, the superstitious luck placebo illusion would be examined by two dependent variables, which are self-reported luck level and behavioral effects. Past study suggested that people would make more risky choices when they feel they acquire good luck as they felt empowered to defeat the odd under the protection from fate (Au et al., 2011). Thus, it is hypothesized that superstitious placebo illusion would not only include self reported luck level, and also affect one's risk-taking tendency. To sum up, it is hypothesized that participants in the P_m group would score higher in both dependent variables, when compared with the other two groups.

Hypothesis 1a: Possession-Matched group (P_m) will report higher luck placebo illusion.

Hypothesis 1b: Possession-Matched group (P_m) will report higher tendency of risk-taking decisions.

Whilst it is proposed that Possession-Mismatched group (P_{mm}) and Non-possession group (NP) would report similar score in both dependent variables.

Since it is supposed that the possession of a lucky product that its features do not match with one's perceived identity (zodiac sign) would not activate the Quality Transference mechanism, no precebo illusion is expected to be found in these two groups.

Hypothesis 2: Possession-Mismatched group (P_{mm}) and Non-possession group (NP) will report similar scores on both luck precebo illusion and risk-taking decisions.

3.2 The Roles of Dispositional traits

Based on the literature review in the previous chapter, the present study intends to identify the dispositional factors that possibly driven the precebo effect. These dispositional traits are believed to be associated with the strength of precebo response.

Hypothesis 3: Specific Dispositional traits will be positively related to luck precebo illusion.

(hypothesis 3a: Dispositional Optimism

hypothesis 3b: Negotiable fate

hypothesis 3c: Agency

hypothesis 3d: Desire for control

hypothesis 3e: Spirituality

hypothesis 3f: Suggestibility)

3.3 The Roles of other factors

The effect of a spiritual ritual on placebo illusion is believed to be moderated by other factors, including anticipated benefit and one's current view of the rituals.

Hypothesis 4: Anticipated benefits moderate the luck placebo illusion.

Hypothesis 5: Current views of ritual moderate the luck placebo illusion.

(hypothesis 5a perceived control of luck/ empowerment

hypothesis 5b: Perceived control of bracelet

hypothesis 5c: Intention to use the bracelet

hypothesis 5d: Imagined consumption

hypothesis 5e: Reward responsiveness)

Chapter 4: Methodology

4.1 Pilot study

The aim of pilot study is to identify which type of lucky product is suitable to be used as stimulus in the main study. As the product will be purported to have metaphysical properties to promote good luck to the possessors, it should have similar characteristics with the luck enhancing products seen from the market, such as colour, materials and appearances. Moreover, it should be gender neutral in which it is suitable for both gender to wear.

Method

33 participants (19 female; 14 male) age ranged from 17 to 27, were recruited in the pilot study¹. They completed an online survey in which they have to rate on different types of bracelets. In this online survey, pictures of 10 bracelets that are made with different materials and designs were presented, participants were asked to rate on a 7-point Likert scale for each product:

- (1) How likely they want to possess and wear the product and
- (2) Their perceived effectiveness of the product in bringing luck.

For some products, participants were also asked to select a colour they most prefer.

Each item was examined by reviewing the participants' preference and its perceived effectiveness as a lucky product. To avoid gender bias, items which have significant differences between genders in their preferences were screened out.

¹ Participants who have participated in the pilot study were not recruited to participate in the main study.

Results

An azure crystal bead bracelet was selected as the stimulus. Azure colour is chosen as various metaphysical crystals in the existing market are also in blue colour and it is gender neutral. In the main study, this crystal bead bracelet was used as a purported astrological lucky charm bracelet, which has the metaphysical capability to bring good fortune.

4.2 Main study

4.2.1 Participants

The participants were seventy-five (16 males, 59 females, $M_{\text{age}} = 21.5$, $SD = 1.1$) university students, some of them participated to fulfill the course requirement, and some were recruited from personal network of the researcher. Participants were first asked to complete an online survey through Qualtrics survey system in Phrase I, and then participated in the experiment in Phrase II a week later, participants were randomly assigned into three groups: Possession-Matched group (P_m), Possession-Mismatched group (P_{mm}) and Non-possession group (NP). Table 1 shows the demographical characteristics of the sample.

Table 1. Demographical Characteristics of Participants (N=75)

Variables	Possession-Matched ($n=26$)			Possession-Mismatched ($n=24$)			Non-possession ($n=25$)		
	n	%	Mean	n	%	Mean	n	%	Mean
Gender Male	6	23.1%		5	20.8%		5	20.0%	
Female	20	76.9%		19	79.2%		20	80.0%	
Age			21.38			21.63			21.56

4.2.2 Procedures

The study comprised of two phrases. In Phrase 1, participants did an online survey. In the first page of the online survey, an informed consent form was included, participant must click on the button of agreement indicating that they have read the consent form information and agree to participate in the study voluntarily.

Afterwards, they were redirected and asked to complete a questionnaire concerning seven measures of personality traits (dispositional optimism, negotiable fate, fatalism, agency, desire for control, spirituality and suggestibility) and demographical information. The survey was conducted in Chinese and the order of all items was randomized by the system. Upon completion, participants received a participant code through email and it was then used for data matching with those in Phrase 2.

In Phrase 2, all participants were instructed to perform two tasks – the communication task and the memory task, and were later asked to complete a questionnaire concerning luck perception and other various luck-relevant measures.

Before the communication task, all participants were first asked to write down a personal unlucky experience over the past three months, which brought them very bad consequences, and wrote down the experience in detail. Participants were given the instruction: *“Try to recall an unlucky experience/event in the past three months and that particular experience due to lack of luck has led to an unpleasant consequence or given your life bad influences. Please write down the course of this experience/event in detail (i.e. its cause, consequence and influence on you)”*. After writing down the event, they answered questions concerning this event, (1) *“In which aspects is this event related to your life?”* and (2) *“To what extent is this event related to luckiness?”* The purpose of this recalling task is to induce participants to have the feeling of unlucky.

Then, participants were asked to complete a communication task. They were told to compose a persuasive message to a communication partner, which is about the

importance of acquiring good luck. Specifically, participants received the instruction: *“This is a communication task, imagine you have a communication partner (e.g. your friend/ family member) and you need to convey a message to him/her, which is “Good luck is very important in one’s life”. Please write down how would you persuade and convey this message to your partner.”* The purpose of this communication task was to enhance participants’ motivation in acquiring good luck. Afterwards, participants completed the current motivation of luck enhancement scale, in which their immediate motivation to enhance their luck was measured.

In the memory task, participants were given a stimulus set, which was a folder comprised of a sheet of information about a particular zodiac sign and a crystal bead bracelet. In the information sheet, it introduced the personality characteristics of a particular zodiac sign, its specific birthstone lucky bead bracelet, its effects and the instructions of using the bracelet. A real object of the luck bracelet was attached to the folder as a stimulus. Participants were asked to read and memorize the information at their own pace and notify the researcher once they finished. Afterwards, they were required to complete a questionnaire regarding the stimulus set they have read.²

Participants from the three conditions were presented with different stimulus set in the memory task. For Possession-Matched (P_m) group, participants were given a stimulus set that matched with their own zodiac sign (e.g. participants born under the sign of Leo were presented with a stimulus set about Leo.) Once they finished

² This memory test can mask the goal of the experiment and to lead the participants to believe that the experiment was about human memory, so as to minimize the demand effect. Besides, it served as a manipulation check to ensure participants have aware whether the luck bracelet was applicable to their own zodiac sign or not

reading the stimulus set, they were told by the researcher that the luck bracelet was a gift to thank them for their participation in the study. They were given the bracelet attached in the stimulus set as a present³ and asked to sign on a form as an acknowledgement in receiving the bracelet, so as to establish their sense of ownership in possessing the luck bracelet. For the Possession-Mismatched (P_{mm}) group, the procedure was almost identical to the P_m group, except that they were presented with a stimulus set that was not matched with their zodiac sign (e.g. participants born under the sign of Leo were presented with a stimulus set about Taurus.) For the Non-possession (NP) group participants, they were presented a stimulus set that was not matched with their zodiac sign and did not receive the bracelet or any kind of gift. Though the NP group participants did not receive any bracelet, they were still being exposed to it during the memory task. This was to ensure all participants were exposed to the same stimulus, and any difference in their perceived luck feeling was not caused by the priming effect or mere proximity of the bracelet.

Though participants received different stimulus sets, all the descriptions in the stimulus sets (for twelve horoscope sign) were identical except for the name of zodiac sign. Specifically, it contained the identical descriptions for personality traits and the birthstone lucky bead bracelet, which was Aquamarine. The Aquamarine lucky bracelet was described as the birthstone of a particular zodiac sign (depends on participants' condition) and it was a talisman of good luck. It has the metaphysical properties that promote good luck, strengthens relationships and attract wealth through balancing individual chakras. It was stated clearly that the bracelet needs to

³ Bracelets were packed in a plastic bag to prevent participants from wearing it

be soaked in distilled water to purify overnight before usage and it only takes effects when one wears it for a long time. In other words, the lucky bracelet does not have any immediate effect to benefit the possessor, regardless of any condition, because the participants did not “use” or “wear” the bracelet as prescribed.

Lastly, all participants were asked to complete a set of questionnaire measuring affect, luck perception, risk-taking decision and other related measures concerning their current view of luck and bracelet (perceived control of luck, perceived control of bracelet, current and future intention to use the bracelet, anticipated benefit, imagined consumption of the bracelet, belief in lucky bracelet and reward responsiveness of luck enhancement). Participants were also asked to reveal their past and current usage of any luck enhancing item and their astrological-related habits. Demographical information was collected, including gender, age, religion and nationality.

4.2.3 Materials/ Measures for Phrase 1

Factor analysis was conducted to explore the factor structure of all scales (see Appendix 1 for details of factor loadings).

Dispositional Optimism. Dispositional Optimism, a dispositional sense to have positive expectations about one’s life, was assessed by the 6-item Chinese Revised Life Orientation Test (CLOT-R) (Lai et al., 1998), which is an adaptation of the 10-item Revised Life Orientation Test (LOT-R) developed by Scheier, Carver and Bridges’s (1994) to measure dispositional optimism among Chinese subjects. To

reduce the length of the survey, four filler items were excluded. Only six of the ten items were used to derive the dispositional optimism score. Three were positively worded (e.g. “I’m always optimistic about my future.”) and three were negatively worded items (e.g. I hardly ever expect things to go my way). Participants were asked to indicate the extent of agreement with each item on a seven-point scale (from 1=“strongly disagree” to 7=“strongly agree”). The scale showed a good internal consistency ($\alpha=.78$).

Negotiable fate. Negotiable fate, the belief that one can negotiate with fate by exercising personal agency even the circumstances and boundaries have determined by fate, was measured by the 4-item Negotiable Fate Measure (Au et al., 2011). All items were translated into Chinese. A sample item is “When fate does not give you the most favorable situations, you need to make the best of the situations you are given”. Participants were asked to indicate their extent of agreement on a seven-point scale (from 1=“strongly disagree” to 7=“strongly agree”). The scale showed an acceptable reliability ($\alpha=.64$).

Fatalism. The idea that all things and events are predetermined by fate and are inevitable, beyond the capacity of individual to control. It is a distinct construct with negotiable fate and holds that fate are unalterable. It was measured by the 4-item measure of Fatalism (Chaturvedi et al., 2009). All items were translated into Chinese. A sample item is “Your paths in life are decided by fate, whether you want it to or not”. Participants indicated their extent of agreement on a seven-point scale (from 1=“strongly disagree” to 7=“strongly agree”). The scale demonstrated a good internal consistency ($\alpha=.72$).

Agency. The idea that individual are in control over environmental constraints and are able to overcome any influence of fate by exercising agentic actions. This is in direct opposition to the concept of fatalism. It was measured by the 4-item measure of Agency (Au et al., 2011), all the items were translated into Chinese. An example item is “You have the power to change and create your destiny”. Participants were asked to indicate how much they agreed on each statement (from 1=“strongly disagree” to 7=“strongly agree”). The scale showed a good reliability ($\alpha=.80$).

Desire for control. Desire for control, the motivation to exercise control over one’s life events, was measured by the Desirability of Control (DC) Scale (Burger & Cooper, 1979). Three of the 20 items were excluded as they are inapplicable to the current participants. The remaining 17 items were translated into Chinese based on the Chinese version by Wei (2003) and were further modified. Among 17 items, 12 were positively worded (e.g. “I enjoy having control over my own destiny”) and 5 were negatively worded (e.g. “There are many situation in which I would prefer only one choice rather than having to make a decision”). Participants indicated their extent of agreement on each items. (from 1=“strongly disagree” to 7=“strongly agree”). Initial factor analysis shows five factors with eigenvalues greater than one were extracted, a second factor analysis was conducted to extract only one factor. This scale demonstrated good reliability ($\alpha=.77$).

Spirituality. A search for the sacred, and the tendency of spiritual belief and practices, was assessed by a 20-item scale, which was adapted from four existing

scales. Three items were adapted from the Spirituality Questionnaire (SQ) developed by Parsian (2009) (e.g. “My spirituality is integrated into my life”), 7 items were adapted from a scale measuring spirituality developed by Lin (2007) (e.g. “I try to achieve inner peace through meditation”), 4 items were adapted from the Spiritual Connection Questionnaire (SCQ)-14 (Wheeler & Hyland, 2008), in which one item was positively scored (“I feel that I am always protected by an ultimate principle, force or being”) and 3 items were reversed scored (e.g. “I feel no spiritual connection to the world around me”). Two additional items were added by the researcher (e.g. “I read books about life philosophy and spirituality”). Participants rated the extent of agreement for each item (from 1=“strongly disagree” to 7=“strongly agree”).

Another 4 items were adapted from WHOQOL SRPB Group’s (2002) WHOQOL Spirituality, Religiousness and Personal Beliefs (SRPB) field-test instrument (e.g. “To what extent does any connection to a spiritual being provide you with comfort / reassurance?”), participants rated on the 4 items to indicate the extent that their spiritual belief have affected the different aspects of their life (from 1=“not at all” to 7=“an extreme amount”). Initial factor analysis shows four factors with eigenvalues greater than one were extracted, a second factor analysis was conducted to extract only one factor. The scale demonstrated good reliability ($\alpha=.94$).

Suggestibility. A personality trait reflects the tendency to accept suggestions from others, was measured by the 21-item Short Suggestibility Scale developed by Kotov and Watson (2007). The instrument consisted of five suggestibility subscales: consumer suggestibility, persuadability, physiological suggestibility, physiological reactivity and peer conformity. All items were translated into Chinese. Participants were asked to indicate the extent to which each statement apply to them on a 5-point

Likert scale. 1="not at all or very slightly" to 5="a lot". A sample item of consumer suggestibility is "I can be influenced by a good commercial" ($\alpha=.76$). An example item of persuadability is "I frequently change my opinion after talking with others" ($\alpha=.77$). An example item of physiological suggestibility is "If I am told I don't look well, I start feeling ill" ($\alpha=.79$). An example item of physiological reactivity is "Thinking about something scary can make my heart pound" ($\alpha=.57$). A sample item of peer conformity is "It is important for me to fit in" ($\alpha=.68$). Initial factor analysis shows five factors with eigenvalues greater than one were extracted and a second factor analysis was conducted to extract only one factor. The overall scale showed good internal consistency ($\alpha=.92$).

Demographical variables. Demographical information was collected, including gender, date of birth and astrological sign. The astrological sign served as an manipulation variable in the experiment in Phrase II.

Materials/ Measures for Phrase 2

Factor analysis was conducted to explore the factor structure of all scales (see Appendix 1 for details of factor loadings).

Current motivation of luck enhancement. The immediate motivation of enhancing luck was assessed by a 6-item scale. Participants were asked to indicate their extent of agreement on each item (from 1="strongly disagree" to 7="strongly agree"). An example item is "I want to be lucky." The scale shows good reliability ($\alpha=.86$)

Affect. Affect, individual's current state of emotion, was measured by the 20-item Positive and Negative Affect Schedule (PANAS) (Watson, Clark & Tellegen, 1988). Ten items measured positive affect and 10 measured negative affect. Participants were asked to indicate the extent to which they felt this way right now on a 5-point scale (from 1="not at all" to 5="extremely"). Both the positive affect scale ($\alpha=.83$) and negative affect scale ($\alpha=.89$) show good internal consistency. Initial factor analysis shows five factors with eigenvalues greater than one were extracted, a second factor analysis was conducted to extract only two factors.

Risk-taking decision task. The tendency of taking risky decisions was assessed by a set of scenarios that involved real-life dilemma. This risk-taking decision task comprises of 7 scenarios, which were modified based on the Risk Scenarios Questionnaire (RSQ) (Rohrman, 2003). Real-life scenarios were presented, each involve a risk-taking option and a risk-adverse option, participants were asked to rate the extent to which they would choose the risk-taking option on a 10-point scale (from 1="definitely not" to 10="for sure"). A sample item is "*Imagine that you will be travelling overseas for several months, taking various equipment with you - a smartphone, video cameras, your lap-top. Because of the risk of theft, you are advised to take comprehensive travel insurance. However, the premium is very expensive for insurance longer than the standard duration of a month. It's possible that you might be lucky and not getting burgled, in which case the insurance costs would be wasted. In such a situation, how likely is it that you would decide to travel without insurance?*"

Luck precebo illusion. Luck precebo illusion was measured by a 8-item scale, 6 were positively worded (e.g. “Luck works in my favor.”) and 2 were negatively worded (e.g. “I will encounter unlucky event.”) Participants were asked to indicate the extent of agreement with each item on a 7-point scale (from 1=“strongly disagree” to 7=“strongly agree”). Initial factor analysis shows two factors with eigenvalues greater than one were extracted, a second factor analysis was conducted to extract only one factor. The scale demonstrated good reliability ($\alpha=.76$).

Perceived control of luck/empowerment Perceived control of luck/empowerment was measured by a 11-item scales, 7 were positively worded (e.g. “I have the ability to enhance my luck”) and 4 were negatively scored (e.g. “I don’t know how to improve my luck.”) Participants indicated the extent of agreement with the items on a 7-point scale (from 1=“strongly disagree” to 7=“strongly agree”). Initial factor analysis shows three factors with eigenvalues greater than one were extracted, a second factor analysis was conducted to extract only one factor. The scale shows good reliability ($\alpha=.85$).

Perceived control of bracelet. Perceived control of bracelet was measured by a 6-item scale, 4 were positively scored (e.g. “I can use this bracelet anytime if I want.”) and 2 were negatively scored (e.g. “The instructions of using this bracelet is difficult for me.”) Participants indicated the extent of agreement with each item (from 1=“strongly disagree” to 7=“strongly agree”). Initial factor analysis shows two factors with eigenvalues greater than one were extracted, a second factor analysis was conducted to extract only one factor. The scale shows good internal consistency ($\alpha=.72$).

Intention to use the bracelet. Intention to use the bracelet was assessed by a 3-item scale, including current and future intention. An example item of current intention is “I want to use the bracelet immediately.” And future intention is “In the future, I will use the bracelet.” Participants indicated the extent of agreement on each item (from 1=“strongly disagree” to 7=“strongly agree”). The scale has good internal consistency ($\alpha=.87$).

Anticipated benefit. Anticipated benefit of using the bracelet was measured by a 6-item scale. A sample item is “I believe wearing this bracelet can enhance my luck effectively.” Participants were asked to indicate the extent of agreement on each item (from 1=“strongly disagree” to 7=“strongly agree”). The scale demonstrated good reliability ($\alpha=.93$).

Imagined consumption. Imagined consumption of the bracelet was measured by a 3-item scale, 2 were positively scored (e.g. “I can imagine how and when I will use this bracelet.”) and 1 was negatively scored (“It is difficult for me to imagine myself using this bracelet.”) Participants indicated the extent of agreement with each item (from 1=“strongly disagree” to 7=“strongly agree”). The scale shows good internal consistency ($\alpha=.72$).

Reward responsiveness. The responsiveness to the benefit of bracelet was assessed by 2 items (e.g. I feel excited when I know I am able to enhance my luck.) Participants indicated the extent of agreement with each item on a 7-point scale (from 1=“strongly disagree” to 7=“strongly agree”).

Belief in lucky bracelet. Individual's belief in lucky bracelet was measured by one item ("To what extent you believe lucky bracelet can enhance your luck?") Participants were asked to indicate their extent of belief on a 7-point scale (from 1="strongly disbelieve" to 7="strongly believe").

4.2.4 Data Analysis

Various statistical tests were conducted for data analysis. For all scales, their reliabilities were assessed by Cronbach's alpha, which is a coefficient measuring the internal consistency of scales. This is to examine whether all items in a scale are measuring the same construct.

Exploratory factor analysis (EFA) was conducted to explore the factor structure of all scales (see Appendix 1 for details of the factor loadings). Under the Kaiser's rule (Kaiser, 1960), it suggests to retain those factors with eigenvalues higher than 1. Initial analysis was done to extract factors with eigenvalues greater than one. For certain scales, analysis were rerun to extract only one factor for all items to see how they could be explained under a single factor.

One-way analysis of variance (ANOVA) was conducted to investigate the difference in luck precebo illusion among different groups. With a 95% of confidence level, p-value that is less than .05 indicate a statistically significant result. Post-hoc tests (Bonferroni test) were used to further examine the pattern of differences among different conditions.

Analysis of Covariance (ANCOVA) was used to examine if there was still significant difference in luck placebo illusion among three groups while controlling for the effects of covariance such as dispositional traits and luck-relevant variables. P-value that is less than .05 indicates significant results with a 95% confidence level.

Chapter 5 Results

5.1 Manipulation of participants' luck enhancing motivation

As a manipulation of the experiment, participants' current motivation of luck enhancement was measured. A one-way analysis of variance (ANOVA) was conducted to test the differences of mean score among three conditions. There was no significant difference of current motivation of luck enhancement at the $p < .05$ level for three conditions, $F(2, 72) = 2.57, p = .083$. The mean score ($M = 4.82, SD = .96$) of all participants was above 4, indicated that the manipulation of communication task was success, all participants in the three conditions were motivated to acquire luck.

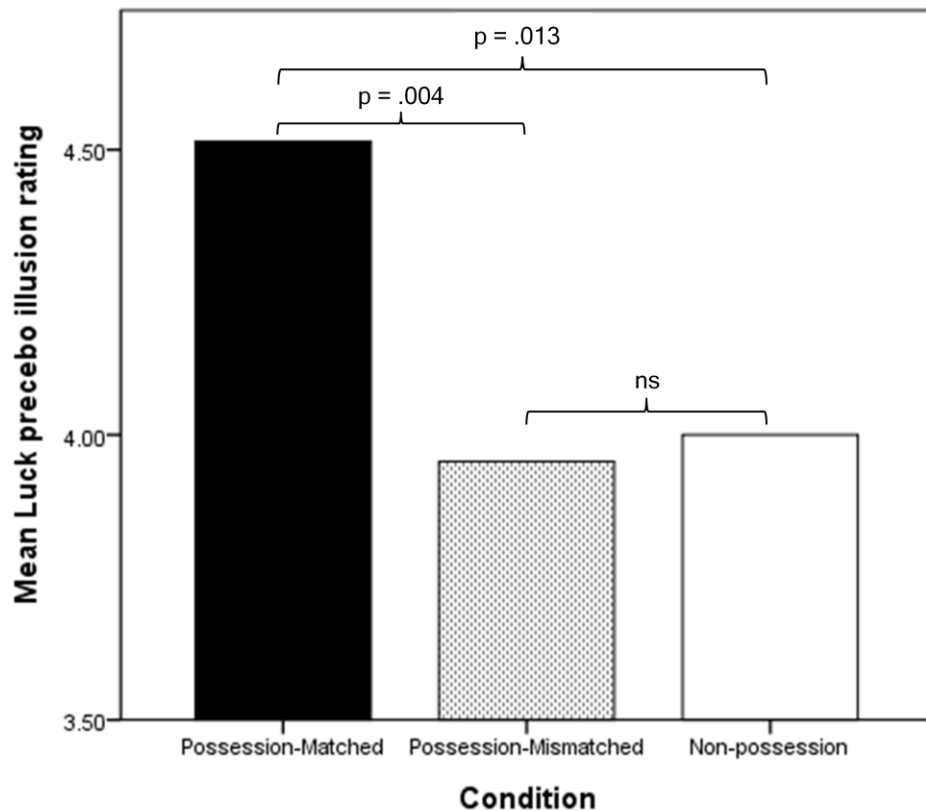
5.2 Luck precebo illusion

A one-way between subjects ANOVA was conducted to test if there is any difference in luck precebo illusion among participants in Possession-Matched (P_m), Possession-Mismatched (P_{mm}) and Non-possession (NP) conditions. There was a significant difference of luck precebo illusion at the $p < .05$ level for the three conditions, $F(2, 72) = 5.20, p = .008$. Post hoc comparisons using the Bonferroni test indicated that the mean score of the P_m condition ($M = 4.51, SD = .68$) was significantly higher than that in the NP condition ($M = 4.0, SD = .75$), $t(49) = 2.56, p = .013$, and also that in the P_{mm} condition ($M = 3.95, SD = .63$), $t(48) = 3.02, p = .004$ (see Figure 1).

To illustrate, in the P_m condition, participants possess a lucky bracelet that purportedly matched with their own zodiac sign showed a stronger luck precebo

illusion, compared to P_{mm} (participants possessing a bracelet mismatched with their own sign) and NP condition (participants did not possess any bracelet).

Figure 1. The mean luck precebo illusion rating in the three conditions



5.3 Risk-taking decisions

A one-way ANOVA was conducted to test if there is any difference of risk-taking decisions among participants in Possession-Matched (P_m), Possession-Mismatched (P_{mm}) and Non-possession (NP) conditions. Nonetheless, the result did not show significant difference of risk-taking decisions at the $p < .05$ level for the three conditions ($F(2, 72) = .23, ns$). It would be addressed in the discussion part.

5.4 Effects of dispositional traits

To explore the underlying dispositional factors driven the luck precebo illusion, a Pearson product-moment correlation coefficient was computed to assess the relationship between the luck precebo illusion and the various dispositional variables (see Table 1). Luck precebo illusion was found to be positively correlated with a range of dispositional variables, including optimism, $r(75) = 0.48, p < 0.001$, negotiable fate, $r(75) = 0.42, p < 0.001$, agency, $r(75) = 0.37, p = 0.001$, spirituality, $r(75) = 0.36, p = 0.001$, persuadability, $r(75) = 0.27, p = 0.019$, and peer conformity, $r(75) = 0.23, p = 0.05$. This implies that participants who are more optimistic, believe in negotiable fate and agency, and who are more spiritual, easy to be persuaded and affected by peer conformity were more susceptible to the luck precebo illusion when they possess a luck bracelet.

Table 1**Correlation matrix: Luck precebo illusion and Dispositional traits (N=75)**

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Luck precebo illusion	(.76)												
2. Dispositional Optimism	.476**	(.78)											
3. Negotiable fate	.421**	.159	(.64)										
4. Fatalism	-.022	-.281*	.029	(.72)									
5. Agency	.373**	.488**	.356**	-.310**	(.80)								
6. Desire for control	.090	.169	.011	-.210	.165	(.77)							
7. Spirituality	.363**	.179	.137	-.028	.046	-.020	(.94)						
8. Suggestibility	.207	.162	.063	.235*	.160	-.251*	.304**	(.92)					
9. Consumer Suggestibility (CS)	.114	.040	.066	.286*	.105	-.135	.202	.883**	(.76)				
10. Persuadability (PER)	.271*	.197	.211	.248*	.175	-.258*	.338**	.875**	.711**	(.77)			
11. Physiological Suggestibility (PS)	.193	.149	.041	.195	.090	-.267*	.332**	.872**	.701**	.702**	(.79)		
12. Physiological Reactivity (PHR)	.068	.022	-.079	.098	.076	-.185	.187	.710**	.522**	.538**	.537**	(.57)	
13. Peer Conformity (PC)	.227*	.287*	.010	.133	.242*	-.217	.208	.854**	.724**	.738**	.659**	.481**	(.68)

Note: * $p < .05$ (2-tailed). ** $p < .01$ (2-tailed).

Cronbach's alpha reliabilities are in parentheses along the diagonal.

Table 2**Correlation matrix: Luck precebo illusion and luck-relevant variables (N=75)**

Variables	1	2	3	4	5	6	7	8
1. Luck precebo illusion	(.76)							
2. Perceived control of luck/empowerment	.219	(.85)						
3. Perceived control of bracelet	.022	-.065	(.72)					
4. Current intention to use the bracelet	.228*	.256*	.189	(.87)				
5. Future intention to use the bracelet	.177	.147	.365**	.686**	--			
6. Anticipated benefit	.234*	.342**	.227	.812**	.685**	(.93)		
7. Imagined consumption	.200	.129	.599**	.491**	.505**	.612**	(.72)	
8. Reward responsiveness	.157	.269*	.273*	.458**	.288*	.527**	.509**	(.38)

Note: * $p < .05$ (2-tailed). ** $p < .01$ (2-tailed).

Cronbach's alpha reliabilities are in parentheses along the diagonal.

5.5 Current view of the lucky bracelet

It is important to explore how individual's current state would affect luck precebo illusion, a Pearson correlation coefficient was conducted to assess the relationship between luck precebo illusion and the current perception concerning luck and bracelet (see Table 2). Luck precebo illusion was found to be positively correlated with current intention to use the bracelet, $r(75) = 0.23, p = 0.05$ and anticipated benefit, $r(75) = 0.24, p = 0.043$.

A one-way analysis of covariance (ANCOVA) was conducted for further analysis, result indicated that once the effects of current intention to use the bracelet and anticipated benefit were taken into account as covariates, the relationship between conditions and luck precebo illusion is no longer significant, $F(2, 70) = 2.98, p = .057$. It implies that current intention to use the bracelet and anticipated benefit are potential moderators of the effect.

5.6 Beliefs in lucky bracelets

Participants' beliefs in the capability of lucky bracelets to enhance luck were measured at the end of the experiment. A one-way ANOVA was conducted to test if there is any difference among participants in the three conditions. At the $p < .05$ level, there was a significant difference, $F(2, 72) = 3.73, p = .029$. Post hoc comparisons using the Bonferroni test indicated that only the mean scores of the P_m condition ($M = 3.62, SD = 1.53$) and P_{mm} condition ($M = 2.5, SD = 1.38$) were statistically different among the 3 pairs, $t(48) = 2.70, p = .010$. No significant difference were found between the P_m condition and NP condition ($M = 3.4, SD = 1.63$).

5.7 Summary

Taken together, these results suggest that luck precebo illusion only occur when participants possess a luck bracelet that is relevant to their horoscope.

And for those who are more optimistic, believe in negotiable fate and agency, and who are more spiritual, easily be persuaded and conform to their peers were more susceptible to the luck precebo illusion. Regarding the luck-relevant variables, results show that the current intention to use the bracelet and the anticipated benefit were potential moderator of the effects on luck precebo illusion.

Chapter 6: Discussion and Conclusion

This chapter discusses the results of the study to examine the superstitious precebo illusion. Theoretical and practical implication, limitation and direction for future research are also discussed.

6.1 Discussion of findings and Theoretical implications

The purpose of the present study is to demonstrate the existence of superstitious precebo illusion and to explore the underlying factors that possibly driven this effect.

In the present study, the results (1) shows the existence of superstitious precebo illusion, (2) identify the dispositional traits and (3) one's current view of ritual that possibly driven this effect.

Existence of Superstitious precebo illusion

Hypotheses 1 concerns the existence of superstitious precebo illusion and its effects. Hypothesis 1a stated that Possession-Matched Group (Pm) will report higher luck precebo illusion rating. Figure 1 depicts the mean luck precebo illusion ratings of three conditions and shows that only participants in the Pm group did report a higher luck precebo illusion rating. This indicates that participants felt luckier after possessing the lucky bracelet, but before any usage. Hypothesis 1a is hence supported.

Hypothesis 1b stated that Pm group will report higher tendency of risk-taking decision. Nonetheless, results did not show any significant difference on participants' risk-taking tendency among three groups. In fact, it is possibly because the risk-taking scenario measures used in the present study was not specifically designed

to evaluate luck-related effects. The presented risk scenario questions mainly examined participants' risk-taking decisions in real-life scenarios, for example, how likely one would bet on horse racing game when facing financial difficulties, but these scenarios are not pure game of chance, one's decision would not only depend on the perceived personal luck, but also the contextual factors, such as one's skill, knowledge and circumstances.

Pure game of chance represents the condition which the outcome is fully determined by chance and people may engage in magical thinking when making decisions. For instance, the roll of dice, the fall of a roulette ball are pure game of chance in which the outcome are out of human control. Wohl & Enzle (2003) suggested that people might convert the pure game of chance into one that the outcomes are controllable through unconventional magical intervention. It has been demonstrated that people's self perception of luck were heightened when they make choices on pure game of chance, which in turn, promote an illusion of control on the games. Thus, approaches of the present study should direct towards pure game of chance in order to examine the behavioral effect of luck precebo illusion rather than risk-taking scenarios that the outcomes are not fully by chance. As such, Hypothesis 1b cannot be supported.

Quality Transference Mechanism

Hypothesis 2 concerns the role of Quality Transference mechanism on creating the luck precebo illusion. It is supposed that possessing a lucky bracelet that their instrumental values do not match with one's perceived identity would not activate the Quality Transference mechanism. Thus, P_{mm} group is expected to have no precebo illusion, same with the NP group. Results show no significant difference between the

scores of the P_{mm} group and NP group, it indicated that hypothesis 2 can be supported. Quality Transference mechanism could possibly be an underlying mechanism of the precebo effect.

The Effect of Dispositional traits

Hypothesis 3 concerns the role of dispositional traits on the precebo effect, certain dispositional traits were expected to be positively related to precebo illusion (H3a: Dispositional Optimism; H3b: Negotiable fate; H3c: Agency; H3d: Desire for control; H3e: Spirituality; H3f: Suggestibility). As shown in the result, dispositional optimism, negotiable fate, agency, spirituality and two sub-scales of suggestibility (persuadability and peer conformity) were found to positively correlate with luck precebo illusion. Thus, H3a, H3b, H3c, H3e and H3f were supported.

The Role of Anticipated benefit and current view of rituals

Hypothesis 4 hypothesized that one's anticipated benefit from the bracelet can moderate the luck precebo illusion. Results revealed that it successfully moderates the precebo effect. Thus, hypothesis 4 is supported.

Hypothesis 5 hypothesized that various current views of rituals can also moderate the luck precebo illusion (H5a: Perceived control of luck/ empowerment; H5b: Perceived control of bracelet; H5c: Intention to use the bracelet; H5d: Imagined consumption; H5e: Reward responsiveness). From the result, it can be seen that current intention to use the bracelet can moderate the precebo illusion. As such, H5c was supported.

Beliefs in lucky bracelets

Results shows that participants in the P_m and NP condition held similar level of belief in the effectiveness of lucky bracelet to bring them fortune. This implies that the difference of luck precebo illusion among P_m and NP condition is not caused by the degree of participants' belief in lucky bracelets, participants in NP condition still hold similar level of belief even though they have no possession of the bracelet. However, participants in P_{mm} condition, after receiving bracelet that is not relevant to their horoscope shows significantly lower belief in the capability of lucky bracelets. The reason behind it is in need of further studies.

6.2 Theoretical implications

The findings of the present study provide additional evidence with respect to the precebo effect. The existence of luck precebo effect was demonstrated through possession of a superstitious luck-enhancing product. This research provides insight on the underlying mechanism of placebo effect by separating the concept of possessing and consuming an object, which imply that people's placebo response might have already been triggered when one possess an object, even before usage. It serves as a base for future studies on how mere possession of objects could drive the placebo response.

In addition, it enhances our understanding on precebo effect by exploring the underlying factors that give rise to it. Findings supported the Quality Transference mechanism to be a potential mechanism drive the precebo effect. Moreover, several dispositional traits were identified as reliable predictors of the superstitious precebo illusion, which could affect people' susceptibility to precebo illusion. It also further

confirms previous findings that suggest people's expectations (anticipated benefit) play a moderating role in bringing about the placebo effect.

6.3 Practical implications

This research has two major practical applications. First, it provides evidence to show placebo illusion as a prevalent experience commonly occurs in our daily life, by focusing on superstitious practices. This research can reveal how merely possessing a luck product could make people to feel benefited from it before utilizing it. This placebo effect can even be extended to other kinds of objects/ products that we encounter in daily life, such as medical treatment and various daily necessities too.

Second, it can also extend our knowledge on consumer behaviour and marketing action. For instance, it extends the scope of effects that marketing actions evoke, such as advertising a product according to consumers' buying motives, might affect consumers' perceived effectiveness of marketed products. This current study revealed the effectiveness of marketing strategy in relation with superstitious belief. Due to the perceived high transferability nature of "luck", people commonly engage in superstitious practices to enhance their own luck. In the existing market, relating products with superstitious belief is one of the prevalent marketing strategies, for example, products such as earphones are adorned with diamond stimulant that matched with zodiac sign and advertised as an astrological luck enhancing item (Japan Today, 2009). The present study provides additional evidence of the effectiveness of superstition-related marketing strategies.

6.4 Limitations and Direction for Future Research

The findings in this study are subject to a few limitations. First, due to a small sample size and its limited focus on college students, caution must be applied, the findings might not be transferable to the general population. Second, the current sample mostly consists of women, in which gender bias might exist. It is recommended that future research should address a larger sample in order to fully examine the placebo effect.

Thirdly, the post-behavioral effects of placebo effects cannot be demonstrated in the present research through questioning on participants' risk-taking tendency. Future experimental investigations are needed to explore how placebo effect would influence one's real-life behavioral risk-taking tendency in pure games of chance, such as the roll of dice, or poker game.

Finally, more research work is required to better understand the underlying mechanism of placebo effect. Present research revealed anticipated reward as a potential moderator of this effect, but future experimentation is required to investigate and confirm its role in the occurrence of placebo effect through manipulation. It is suggested that future research can manipulate one's reward anticipation by engaging participants in cognitively distracting tasks, in which they would not have cognitive resources for reward anticipation. Thus, the role of reward anticipation on placebo illusion can be examined by comparing the outcome of different conditions.

6.5 Conclusion

Despite its several limitations, the present research still provides contribution to our understanding of precebo illusion. All in all, it has demonstrated the existence of precebo illusion through superstitious rituals, and the findings reveal its underlying mechanism and factors related to the illusion. The study has also gone some way towards enhancing our understanding of marketing strategy, but further research are recommended to explore the types of products which are more susceptible to this precebo illusion and to investigate its underlying mechanism.

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