농경제학 석사 학위논문

Influence of Social Exclusion on Consumer's Food Decisions

사회적 고립감이 소비자 음식 선택에 미치는 영향

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Abstract

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The growing amount of studies has empirically demonstrated the factors, which influence on an individual's food choice. Based on the previous findings of social exclusion, this study aims to investigate the influence of social exclusion on people's food decisions. Also, moderators such as sex, meal patterns, BMI, self-esteem, and diet restriction were adopted for more specified analysis. To verify the research model, the experiment was designed, and data were collected from 96 samples. Logistic regression model was used to analyze the data. The results showed the socially excluded people were likely to choose unhealthy food, and this main effect was moderated by sex, being on a diet, and diet restriction. Moreover, the academic and practical implications of the study were provided in detail.

Keywords: Social exclusion, Food decision, Moderators, Experiment, Logistic regression

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Ⅰ. Introduction

1. Background

Not only is food a substance that furnishes nutrients we need for living such as protein, carbohydrates, and fat, but also it is closely related to our physical and mental well-being. Healthy food consumption is the main prevention of health problems such as obesity, cardiovascular diseases, diabetes (Howard et al. 2006; Puhl et al. 2012; Puhl et al. 2007). Also, certain kinds of food such as “comfort food” sometimes have psychological value (Wansink et al. 2003).

However, during the past two decades, food-related health problems such as food addiction and obesity has been steeply increasing (Puhl et al. 2012; Puhl et al. 2007). A literature review found that more than 35% of men and women in United States are obese, and that more than 16.9% of U.S. children and adolescents are also obese (Ogden et al. 2012). In the midst of obesity epidemic, obesity has become the leading preventable cause of death (Barness et al. 2007). To save the situation, many effort and expenses have been invested. Polices such as labeling the nutrition information on food products have tried to help consumer make more informed decisions. Also, researchers have investigated the factors that lead people to consume more than they need and to choose high-calorie food.

Such efforts have identified the influences on an individual’s food decision. First, personal eating habits subtly could affect the amount of food we eat. One study found that people who depended on the external

cues of satiation such as “The TV show is over” and “the plate is empty” were likely to eat more than people who used internal cues of satiation such as “I am no longer hungry” (Wansink et al. 2007a).

Also, the food itself and the factors related to serving are indicated as the causes of overeating. A previous study identified the people’s attitude toward “low-fat” food and its impact on the amount of consumption (Wansink et al. 2006a). According to Wansink et al. (2006), people are likely to eat more when the food is labeled “low-fat”, causing more consumption of calories. Serving portion such as the size of popcorn container and plate size also unknowingly have an influence on an individual’s food decision (Argo et al. 2012; Wansink et al. 2005a; Wansink et al. 2001). Studies have found that the large serving size leads people to eat more amount of food, even regardless of the taste (Wansink et al. 2001). Also, Argo et al (2012) recently found that people with lower appearance self-esteem ate more when food packaging is small. Otherwise, the various factors other than the consumer’s perceived variety of food (Kahn et al. 2004), labeling nutrient information (Kozup et al. 2003) affect consumers’ food decision.

On the other hand, social factors such as the presence of other people during the meal time have also been found, which could influence an individual’s food decision (Conger et al. 1980; Péneau et al. 2009; Vartanian et al. 2007). Previous studies have demonstrated that people were likely to eat more when they are eating with others (De Castro

1990; De Castro 1994; De Castro et al. 1990; Herman et al. 2003; Salvy et al. 2007). Moreover, previous study has been shown that social support could even mitigate the loss of appetite caused by stressful events (McIntosh et al. 1989).

In this paper, the main goal of this study is to investigate the influence, which may have the association with individuals' food decisions. Particularly, the recent study focuses on the certain social influence – social exclusion. In other words, this study aims to demonstrate the causal relationship between social exclusion and consumers' food decision. Thus, this study first investigates whether social exclusion has influence on individuals' food decisions. Also, the present study hypothesizes that other factors such as sex, BMI, self-esteem, diet restriction, meal regularity, having breakfast, and being on a diet could moderate the causal relationship between social exclusion and consumers' food decisions.

2. Definitions

Before further discussion, the key concepts used in this study need to be defined: 'food decision" and 'social exclusion".

Wansink et al (2007b) claimed that people usually make 200-300 decisions about food every day. In the study, they define 'food decision' as the decision-making process about "what we eat, how much we eat, and how the food is" (Wansink et al. 2007b). That is, individuals daily made their mind about the food they eat, the amount of consumption, and the appraisals on the food. Thus, this study adopted Wansink et al

(2007b)'s definition of food decision.

Also, Twenge et al. (2001) defined the term social exclusion as "being excluded and isolated with rather explicit negative signs". Similarly, social rejection is "a declaration that other people do not want to interact with a person any longer", and ostracism is " being ignored or excluded, not necessarily with explicit negative signs" (Williams, 2007). That is, the three terms all indicate the status or the situation of the individuals excluded by others, and the terms can be used interchangeably (Williams, 2007). According to Twenge et al. (2001), the term 'social exclusion' means "being excluded and isolated with rather rather explicit negative signs" in this study.

3. Research Questions

Previous studies have demonstrated that our eating environments - both physical and social also have significant effects on the food decision. Viewing TV (Stroebele et al. 2004), listening to music (Bellisle et al. 2004; Stroebele et al. 2006), the lighting (Scheibehenne et al. 2010), and proximity to the food (Wansink et al. 2006b) are all identified to have influence on an individual's eating behavior. Also, social environments have influence on people's food intake. Studies have found that the existence of others unknowingly affects the amount of food (Herman et al. 2003; Vartanian et al. 2008). According to these studies, people tend to eat 30-50% more when they eat with other people than when they eat alone.

Based on the previous findings, the present paper aims to identity the

connection between an individual's food decision and a particular social experience – social exclusion. Just as the food decision is prevalent, social exclusion is also a ubiquitous social phenomenon from the primitive age (Williams 2002; Williams 2007b). Cognitive, behavioral, affective, and physiological changes have been reported as the negative reactions to ostracism experience. In some extreme cases, excluded people showed depression, committed suicide and even committed school shooting (Leary et al. 2003; Twenge et al. 2001).

Consequently, the following questions are what the recent study aims to address.

1. Is there any causal association between an individual's social exclusion experience and his or her food decision?
2. Could other factors such as age, gender, diet, BMI, life satisfaction, and self-esteem shape people's food decisions or moderate the influence of social exclusion on people's food decisions?

Thus, the goal of this study is to identify whether social exclusion affects people's food decision and whether other individual differences determine people's eating behavior. To attain this goal, the present paper hypothesizes that exclusion experiences make people to choose unhealthier, higher calorie food and the hypothesis is proven through conducting an experiment. By doing so, this study not only could contribute to understanding people's food decision, but also could provide therapeutic implications to those who are suffering from food-

related health problems.

II. Literature Review

1. Food Decisions

1.1 Chemosensory Influences

Researchers have dedicated to identifying the factors that have influence on individuals' food decision. Among many studies, one line of study has focused on the inherent components of Food such as taste, smell, color, and texture. Through the consumer survey, Food Marketing Institute (1996) evidenced that the taste is the main influence on consumers' food decision. Given that taste is "the chemical senses of taste and olfaction, as well as the oral perception of texture" (Moskowitz 1978), studies have found that people have general preference to sugar and fat (Drewnowski 1987; Drewnowski et al. 1983). Furthermore, one study suggested the understanding frame of human food decisions (Drewnowski 1997). This study maintained that the taste itself had effect on human food intake and its effect was intertwined with various other factors such as genetic, physiological, social, and economic characteristics.

The food color also has extensive effect on individuals' food decision. Rather does color have the direct effect on people's food decisions, it forms intertwined influences with other factors. Regarding the influence of food color on consumer's food decisions, a prior study

suggested the integrated review (Clydesdale 1993). The study showed that the color of food affects an individual's sweetness perception, saltiness perception, flavor perception (lime, lemon, cheery, grape, etc.), food preference, pleasantness, and acceptability. It also emphasized the color's extensive influence on an individual's sensory perception, (Clydesdale 1993). Also, based on the color of the given food, people make judgments whether the food is fresh and safe (Wheatley 1973).

Moreover, it is generally understood that the smell of food has the combined influence on food decision (Mattes et al. 1990; Schiffman 1993). People with chemosensory disorders showed the decreased food intake while the simple sensory loss of taste and/or smell causes weight gain (Mattes et al. 1990). Also, the deficits in chemosensory ability caused by aging also gradually affect people's food intake (Schiffman 1993).

The texture of food also has influence on the people's food decision, which is often combined with the taste (Brandt et al. 2006; Drewnowski 1987). Fat content is perceived by smooth and creamy texture while chewing and swallowing (Brandt et al. 2006). Also, fat content exposed to high temperature can be transferred as crispy and crunchy textures (Drewnowski 1987). Based on the universal preference to fat, creamy, smooth, crispy, crunchy, or brittle texture has influenced on people's food intake.

1.2 Cognitive Influences

When it comes to served meal and/or packaged food, such things as portion size, unit size, packaging, nutritional information, and/or how people perceive these factors determine individuals' food decisions (Argo et al. 2012; Raynor et al. 2012; Wansink et al. 2006a; Wansink et al. 2005a; Wansink et al. 2007b). Unlike the chemosensory aspects such as taste, color, and smell, these factors have "nudging" influence on people's food decision (Downs et al. 2009). That is, even though the factors have pervasive influences on people's decision making, individuals are almost unaware of or underestimate the influences.

Many previous studies have proved that larger portion size leads to larger food intake (Raynor et al. 2012; Rolls et al. 2002; Rolls et al. 2004b; Wansink et al. 2005b). Rolls et al. (2002) found that the more food is served, the more food people eat. The effect of portion size on the amount of consumption is significant in both normal-weight and overweight adults. Likewise, bigger portion size of sandwich led people to consume more energy (Rolls et al. 2004a). Also, Wansink et al. (2005b) investigated whether larger bucket size led to more consumption even in case of old popcorn. The results showed that the influence of portion size remain powerful regardless of the taste. People tend to eat more popcorn when the popcorn is served in bigger bucket, even though the popcorn is 14-day-old.

Packaging of food also affects people's food decision. In one study, Rolls et al. (2004a) demonstrated that people tend to consume significantly more amount of potato chips when it is packaged in bigger

packages. Likewise, Wansink et al. (2007b) showed the association between package size and the amount of consumption. Also, another study investigate the influence of unit size on people's food decision (Raynor et al. 2012). This study showed that larger unit size led people to eat more without the objective serving guideline. The study suggested that the objective serving guideline be presented to prevent consumers from the uninformed decision making. Furthermore, Argo et al. (2012) recently investigated the moderating role of appearance self-esteem. The study displayed that people with lower appearance self-esteem tended to eat more, ironically when they are given smaller-packaged food. Otherwise, people with higher appearance self-esteem showed the decreased level of food consumption when they are served with smaller package (Argo et al. 2012). Regarding this ironical phenomenon, the study proposed that people with high appearance self-esteem tend to have internal locus of control whereas people with low appearance self-esteem are likely to have external locus of control. Thus, an individual with low appearance self-esteem are likely to lose control over how much they eat to the small packaging, and this, in turn, leads the individual to overeat with the small packaged food (Argo et al. 2012).

In order to help consumers to make more informed decision making on food, the Nutritional Labeling and Education Act (NLEA) was enacted in 1997. Since then, researchers have considered the nutrition information on product packaging or on the menu as another factor influencing people's food decision, and they have investigated the

influences. Wansink and Chandon (2006) showed that the low-fat nutrition labels increased individual's perception of appropriated serving size. Also, the low fat labels made people less guilty about their consumption size. Discovering the simple "low fat" label could lead people to consume more amount of food, and they also demonstrated that suggesting the objective serving information could reduce this influence of the "low fat" label on people's food decision (Wansink et al. 2006a). Another study was interested in the health claim of the food as well as the nutrition information (Kozup et al. 2003). Kozup et al. (2003) hypothesized that a health claim (heart-healthy) of the food product had effect on consumers' evaluations - their attitudes toward the product and toward the nutrition, purchase intention - and also reduced consumers' perception of the risk of heart diseases. They also hypothesized the interaction effect of nutrition information on the health claim. That is, the unfavorable nutrition information along with the health claim had a negative effect on product evaluations, lowering the credibility of the information. The results of the study emphasized the delivery of the consistent claim with a product's nutrition information.

1.3 Environmental Influences

The environment where people are eating has been also proven to affect people's food decision. The environment includes lighting, temperature, sound of the place, proximity of foods, availability, visibility, variety, and quantity of foods.

Previous studies found the influence of proximity and visibility of

foods on people's food decision (Engell et al. 1996; Wansink et al. 2006b; Williams 2002; Williams 2007a). One study demonstrated that people tended to eat more and more often when the food is "around" them than the food is less accessible (Engell et al. 1996). Also, another study noticed the proximity to food. Wansink et al. (2006) showed that people ate less amount of candy after the candy bowl had moved farther. They concluded that the longer distance to food gave people opportunity to consider whether they really wanted more consumption.

Moreover, variety and quantity of food affect an individual's food decision. According to Kahn and Wansink (2004), people tend to eat more, when various kinds of food are available. One example is a buffet. One study showed that people consumed more amount of food because a buffet table offers abundant sorts of food (Maykovich, Stunkard, and Mazur, 1978). Likewise, it has been proven that the amount of consumption is proportional to the quantity served (Rolls et al. 2006; Young et al. 2002).

Lighting is another factor shaping individuals' food decision. A prior study proved that people consume more amount of food when they eat in the dark (Scheibehenne et al. 2010). Other previous studies have found that people are more dependent on the external satiation cues, especially visual cues, than the internal ones (Wansink, Painter, and North, 2005; Fedoroff, Polivy, and Herman, 1997). However, the darkness undermines these visceral cues of satiation. Thus, people who eat in the dark are less likely to regulate their consumption than those in

the light.

Similarly, listening to music and watching TV during the meal could also influence on people's food decision (Stroebele et al. 2006). A previous study found the correlation between the frequency of meal and TV viewing (Stroebele et al. 2004). Another study suggested that watching TV while eating could distract internal satiation cues, which leads people to overeat (promoting..the irrational). Also, Stroebele et al. (2006) noticed that listening to music during the meal increased the amount of consumption. Another study showed that louder music made people to drink more (Lindman, Lindofrs, Dahla, and Toivola, 1986). Furthermore, people under faster pace of music are likely to drink fast (McElrea and Standing, 1992) whereas people under slower music are likely to drink slowly (Milliman, 1986).

1.4 Social influences

Regarding the influence of others during the meal, there are two seemingly contradictory explanations. Some studies have suggested that eating with other people causes "social inhabitation" effect (Conger et al. 1980; Péneau et al. 2009; Vartanian et al. 2007). This means the presence of others at eating moments inhibits the amount of food intake. On the other hand, larger volume of studies have claimed "social facilitation", which means that eating with others fosters food intake so that an individual consumes more amount of food (De Castro 1990; De Castro 1994; De Castro et al. 1990; Herman et al. 2003; Salvy et al. 2007).

2. Social Exclusion

0.1. Forming social bonds and social exclusion

Every animal evolves the way it adapts to the environment and increases the chance to survive. Human's social structure is considered as one of the most important adaptations (Baumeister et al. 2002). By forming the social structure human beings have facilitated reproduction and have provided themselves with shelter from outside world (Axelrod 1981; Axelrod 2006; Buss 1990). Given that belonging into a social group has the evolutionary values, the individual excluded from a social group – the social inferior - is more likely to expose to the external threat and is then, less likely to survive.

Confirming the importance of belonging to a social group and building social relationship, large volume of prior studies proposed that human beings have the need for sense of belonging (Baumeister et al. 1995; Bowlby 1976; Maslow 1968; Williams 1997). According to Maslow's the Hierarchy of Needs (1968), humans have "Love and Belongingness needs", and these needs are ranked in the middle of needs hierarchy. Bowlby's (1976) attachment theory also emphasized the importance of social bonding. The theory proposed that an individual's attachment experience at the early stage of lifetime affects the way he or she interacts with others for the rest of life.

Particularly, Baumeister and Leary (1995) suggested that human beings have the 'need for sense of belonging', the most basic and pervasive

human drives, and social exclusion thwarts that need. Through the extensive interdisciplinary review – from psychology, sociology to physiology, the study illustrated the human tendency to form and maintain social bonds. It first showed how little it takes to form social bonds. For example, the study introduced one study, which demonstrated that mere proximity is a key factor of forming relationship (Festinger 1963). That is, to live close to each other could be good enough to create social attachments. Furthermore, the study noted human inclination to keep once formed attachment, showing that people tend to be in favor of in-group members (Billig et al. 2006; Tajfel 1970; Tajfel et al. 1974), and that this in-group favoritism can be observed even when the in-group members are former rivals or opponents (Orbell et al. 1988).

Since the need to belong is a basic and pervasive drive, people not only try not to end existing social bonds but also show emotional distress in the response to the end of relationship. Even in the case of destructive relationships - such as the relationship with the abusive partner, peoples are unwilling to break the bonds and tend to preserve the relationships (Strube 1988). The belongingness theory interprets this tendency as the reluctance to break social bonds, which is stemming from the powerful need to belong (Baumeister et al. 1995). With the sufficient empirical evidences, Baumeister and Leary (1995) ultimately support that human beings are motivated to create social bonds, get accepted within the bonds, and maintain the relationships.

On the other hand, Williams (1997) noted the functional roles of ostracism. Human, even some animals, has been using ostracism as the mean of punishing "noncontributing members" and of promoting the cohesiveness among group members. Even though ostracism provides the functional values to the "source", it also causes negative effects on the "target" – the victim of ostracism. Williams (1997) proposed that since ostracism is a uniquely aversive social experience, it threatens the target's four fundamental needs: belongingness, self-esteem, control, and meaningful existence. The study also supported the importance of these four needs with various empirical evidences, which demonstrated that people seek the sense of belongingness (Baumeister et al. 1995), self-esteem (Steele 1988), the sense of control (Burger 1985; Burger 1992), and meaningfulness of life (Greenberg et al. 1990; Greenberg et al. 1992).

For the further development, this study adopts the Baumeister and Leary's (1995) view that "need to belong" is a powerful and basic human need, and thwarting the need causes various aversive symptoms to individuals.

0.2. Social Exclusion and need to belong

As an adaptation to the environment, forming social structure offers human beings a better chance to survive than standing alone. For such reasons, social inclusion or social attachment is evolutionarily important for humans, and socially excluded ones have shown negative

reactions in physical, affective, cognitive, and behavioral ways.

Baumeister and Leary (1995) conceptualized the “Need to belong” as the human need to form and maintain at least a minimum quantity of interpersonal relationships. They integrated previous works in terms of the need to belong. First, the study provides the reason why people form social bonds. Also, it demonstrated the emotional, cognitive evidences of the existence of need to belong. The numerous negative consequences caused by the deprivation of belongingness further support its need to belong proposition.

The growing amount of studies has empirically demonstrated the effects of thwarted need to belong. Results of previous studies have shown that social exclusion and unmet belonging needs relate to aggressive behavior (Twenge et al. 2001), prosocial behavior (Twenge et al. 2007), and self-defeating behavior (Twenge et al. 2002). Also, individuals experiencing rejection have displayed compromised cognitive processing (Baumeister et al. 2002), time perception and self-awareness (Twenge et al. 2003), and self-regulation (Baumeister et al. 2005). Moreover, researchers have found that excluded people showed physical and mental changes in response to social exclusion (Baumeister et al. 2002; Cold ; Eisenberger et al. 2006; Twenge et al. 2003).

0.3. Influences of Social Exclusion - Consequences of Thwarted Need to Belong

Based on our discussion about how important social bonds are to human beings, this study focuses on the negative influence of social exclusion. Since the need to belong is a motivational basis for human beings, social exclusion causes various kinds of reactions to human functioning. As a mediator, the need to belong bridges the social exclusion to its effects on human, and the sufficient amount of previous works adequately support the model of this paper. Based on the findings of previous studies, this section reviews the physiological, affective, behavioral, and cognitive consequences of social exclusion and the thwarted need to belong. A previous study conducted the extensive review regarding the influences of social exclusion, and Figure 1 presents the results of the integrated review (Kim et al. 2012).

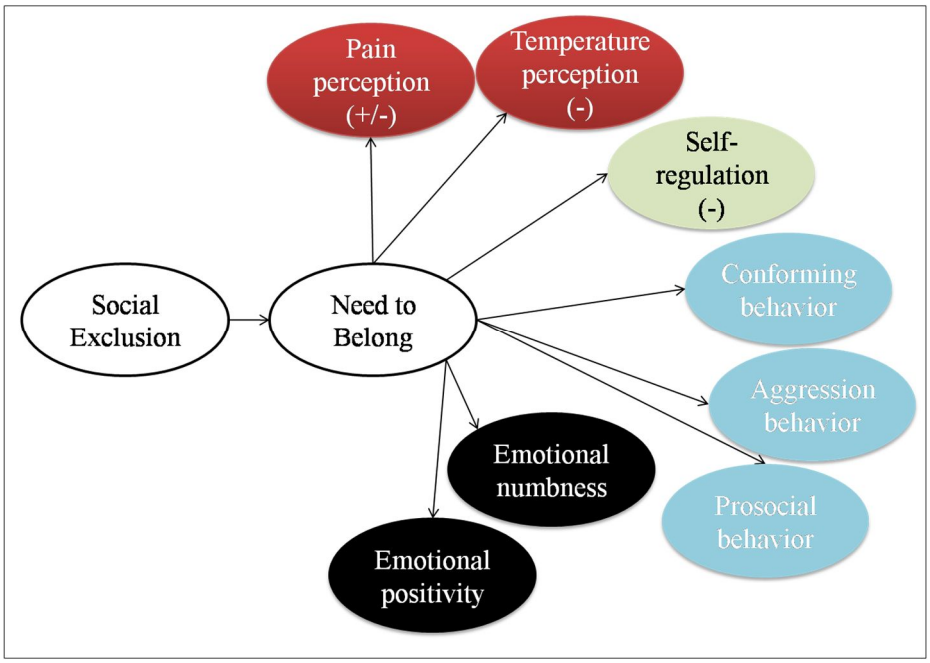

Figure 1 Influences of social exclusion adopted and modified from (Kim et al. 2012)

Physiology and Social Exclusion

According to the DeWall and Baumeister (2006), the social exclusion caused the loss of sensitivity to physical pain – excluded people showed increased tolerance. This study suggested that this insensitivity to pain was connected to lack of empathy, demonstrating that reduced sensitivity to pain was correlated with the breakdown of emotional response such as affective forecasting and empathic reactions (DeWall et al. 2006). However, on the other hand, another study reported that people with unmet need to belong tend to sensitively react to physical pain (Eisenberger et al. 2006).

Also, in one study, Eisenberger et al. (2003) hypothesized that the brain bases of social pain are similar to those of physical pain. The anterior cingulated cortex (ACC) and the right ventral prefrontal cortex (RVPEC) were more active during the exclusion than during the inclusion. Also, they found that ACC changes mediated the RVPEC-distress correlation, suggesting that RVPEC regulates the distress of social exclusion by disrupting ACC activity (Eisenberger et al. 2003). Thus, the patterns of activations are similar to physical pain during the exclusion, which indicated that regulation of social pain and physical pain share a common neuroanatomical basis.

Furthermore, rejected people are likely to feel cold (Zhong et al. 2008). One study found that excluded people estimate the temperature around them significantly colder than other people. Another study hypothesized that relationship between the base line sensitivity to

physical pain and social exclusion, and the result provides support for the conclusion that pain distress and social distress share neurocognitive substrates.

Self-Regulation and Social Exclusion

In their study, Baumeister et al. (2005) defined self-regulation as an effective capacity for conforming behaviors to socially proper manners (Baumeister et al. 2005). Baumeister et al. (2005) proposed that human developed self-regulation as a compromising tool, which keep an individual balanced between selfish needs and social value. From this point of view, the purpose of the self-regulation is to secure acceptance by others. In fact, the previous empirical studies demonstrated that people who lack self-regulation are less likely to accommodate successful relationships with their romantic partners (Finkel et al. 2001), and children with poor self-regulation are less popular within their peer groups (Maszk et al. 1999).

Based on the previous findings, Baumeister et al. (2005) hypothesized that social rejection may impair self-regulation. In the study, people anticipating lonely future showed lower level of self-regulation than the normal people. People who are told that they will be lonely in later life tend to consume less amount of healthy but bad-tasting beverage, eat more fattening cookies. Also, these people were less persistent on unsolvable puzzle and performed worse at dichotic listening task than normal people, which all manifested the decline in self- regulation (Baumeister et al. 2005).

Baumeister et al. (2005) further suggested the alternative explanation to the various symptoms of social exclusion. That is, the decline in self-regulating capacity, caused by exclusion experience, could be a possible mediator between social exclusion and the symptoms such as aggressive behavior, self-defeating behavior. Although this supposition needs empirical evidences to earn explanation power, it provides the useful insight about the existence of the mediator.

Emotion, including no moderating effect of mood

Some researchers have noticed the seemingly unnatural phenomenon. Throughout the social exclusion study, excluded people have reported no mood change. Even though it is natural for ostracized people to feel unpleasant, large amount of prior works have failed to find the association between emotion and the caused symptoms of exclusion manipulation (Baumeister et al. 2002; Twenge et al. 2003; Baumeister 2005; Twenge et al. 2007, to name a few).

Noticing that there has been neither significant changes on mood nor the mediating role of the mood, Baumeister et al. (2008) found that rejected people showed the "emotional numbness" when social exclusion occurs to them. One explanation to the phenomenon is that being rejected unanimously by a group of peers did not elicit very much emotional distress. However, the defensive mechanism of emotional numbness is more possible explanation. That is, to deal with impactful and puzzling exclusion experience, the defensive mechanism causes the emotional numbness (Baumeister et al. 2009). Baumeister et

al. (2009) further suggested that this emotional shutdown could relate to the lack of empathy toward others.

Prosocial Behavior

Prosocial behavior is performed to benefit others rather than to benefit the self. However, it is not considered as irrational or self-destructive to perform prosocially, because the belongingness to the group provides equivalent, or more, benefits in the long run. To some extent, people perform prosocial acts at the exchange of the attachment and belongingness the group provides.

In the experiment, the amount of money participants donate was the measure of the prosocial behavior, and the amount of money from the future-alone group was significantly different from that of from future-belonging, future-misfortune, and no-control groups. Since there was no difference among the latter three groups, the exclusion only could explain the difference. Another experiment in the study adopted spontaneous helping behavior as the measure of prosocial behavior – helping to pick up the pencils that accidently spilled onto the floor (Latane et al. 1975). Participants in the future alone condition were less willing to help the experimenter to pick up the pencils. Also, in different setting of experiment, which uses the prisoner's dilemma game (Rapport et al. 1965), experimenter observed the cooperation behavior as the measure of prosocial act. The result was consistent with other experiment; the rejection group showed less willingness to cooperate. Furthermore, Twenge et al. (2003) proposed that the lack of

empathy mediated the link between social exclusion and prosocial helping behavior. The lack of empathy may be explained by the protective emotional numbness caused by social exclusion (DeWall et al. 2006).

III. Research Model and Hypotheses

1. Research Model

According to Baumeister et al. (2002) and Twenge et al. (2003), social exclusion experience affects people's cognitive processing. Also, previous studies have found that human cognitive biases could be related to one's food decisions (Chandon et al. 2007) and one's BMI (Borghans et al. 2006; Ikeda et al. 2010). Based on these previous studies, the present study develops a research model (see Figure 2**오류! 참조 원본을 찾을 수 없습니다.**) that hypothesizes social exclusion has influence on the individual's food decisions.

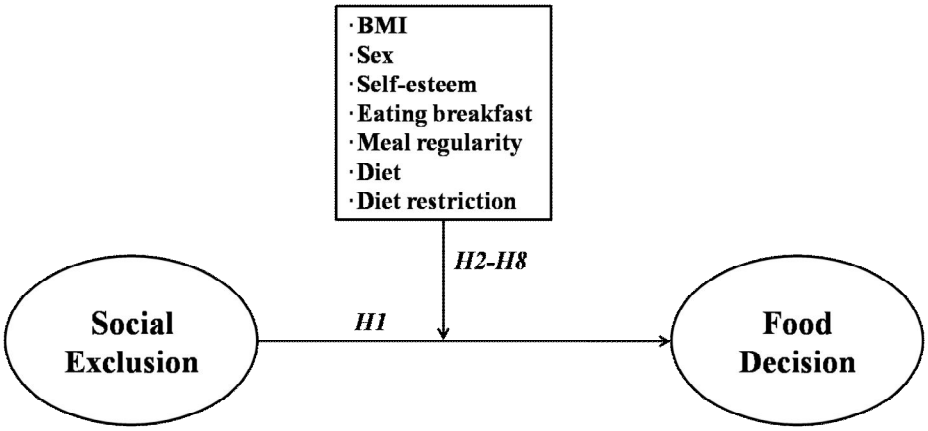

Figure 2 Research Model

2. Hypotheses Development

2.1. Hypotheses

Baumeister et al. (2002) demonstrated the reduced function of cognitive process in their study. In the study, participants under the anticipated solitude condition showed a significant drop in intelligence performance, especially the decline in the functioning speed. Also, excluded people seemed to have difficulty in retrieving information from memory and in using it to solve difficult problems. Moreover, while there were no significant differences in recalling simple memory between the conditions, social exclusion caused the significant reduction in logical and reasoning abilities.

Another study suggested that excluded individuals had false time perception in which the present seems to last longer than usual (Twenge et al. 2003). In the same study, rejected people also showed the lowered level of self-awareness and the lessened meaningfulness of life, all of

which are the usual symptoms of depressed people. Furthermore, it is found that ostracized people are likely to recall social events better than normal people, which evidenced social exclusion also relates to selective memory (Gardner et al. 2000).

Previous studies have pointed out calorie underestimation as the alleged cause of obesity. However, Wansink et al. (2006) questioned this association and hypothesized that meal size, not BMI, was related with calorie underestimation. The study found that there was negative correlation between meal size and calorie estimation. That is, large meal size increased one's insensitivity to accurate calorie. Furthermore, another study demonstrated that larger meal size had influence on the increased food intake (Chandon et al. 2007).

Based on these previous findings, the present study builds the first hypothesis, which links social exclusion experience and an individual's food decision

H1. Social exclusion has influence on an individual's food decision

2.2. Moderators

Previous studies have demonstrated the gender differences in food decision (Wardle et al. 2004;' Baker et al. 2003; Cooke et al. 2005). Analyzing data from 23 countries, Wardle et al. (2004) found that women were more likely to consume high-fat foods than men, and women had stronger beliefs in healthy diet. Also, sex difference often

played the moderating role to the main effect. Oliver et al. (2000) investigated that the effect of stress on people's food choice and food intake. Stressed people tended to choose sweet and high-fat foods compared to the normal people, and this tendency was more salient in female participants. This study also adopted sex variable as one of moderators to specify the relationship between social exclusion and food decisions. Thus, the present study hypothesized that the effect of social exclusion could be differentiated by sex.

H2. Sex moderates the relationship between social exclusion and food decisions

Also, prior studies have observed the effect of meal pattern on people's food intake and their health. Haapalahti et al. (2003) found that socio-economic status of family had major effect on children's food intake and meal pattern, and skipping meals related to consuming more sweet foods and fewer vegetables. Furthermore, another study investigated the relationship between meal pattern and other lifestyle factors (jöberg et al. 2003). The results showed that irregular meal patterns such as skipping breakfast were related to negative lifestyle factor – for example, smoking, consuming alcohol. Also, girls skipping breakfast were likely to choose unhealthy food choice such as snacks and sweets. Thus, the present study also investigated the effect of meal pattern on the relationship between social exclusion and food decisions. Accordingly, this study hypothesized that meal pattern could differentiate the influence of social exclusion on an individual's food

decisions.

H3. Eating breakfast moderates the relationship between social exclusion and food decision

H4. Meal regularity moderates the relationship between social exclusion and food decision

H5. Being on a diet moderates the relationship between social exclusion and food decision

People whose BMI is more than 30 are labeled as obesity. Many previous studies have adopted BMI and tried to find association with various food-related behaviors. Lahti-Koski et al. (2002) found the association between BMI and food choices, alcohol intake, and smoking history. They concluded that low vegetable consumption, moderate alcohol consumption, nonsmoking, and physically active lifestyle could realize optimal BMI. Also, cognitive biases have associations with an individual's BMI. One study showed that one's time discounting was related to his or her BMI (Ikeda et al. 2010). Thus, this study adopted BMI as one of the moderators, and hypothesized that BMI showed the interaction effect on the influence of social exclusion on people's food decisions.

H6. BMI positively moderates the relationship between social exclusion and food decision

Moreover, previous literature has found the association between self-esteem and other food related behaviors. One study demonstrated that

night eating syndrome is related to low self-esteem, depression, and less daytime hunger in obese people (Gluck et al. 2012). Also, various eating disorders such as binge eating, anorexia were more prevalent in low self-esteem people than the normal people (Heatherton et al. 1991; Fairburn 2001). Thus, the recent study adopted self-esteem as one of the moderators of study, and built the 7th hypothesis.

H7. Self-esteem positively moderates the relationship between social exclusion and food decision

Previous studies have pointed out the negative consequences of diet restriction (Polivy 1996). The study maintained that losing weight through the dietary restriction could cause binge eating, emotional responsibility, dysphoria, and distractibility. Another study showed that restrained eaters were likely to compose their diets with high proportion of vegetable and fruit to limit their calories (Pollard et al. 2002). Thus, this study also included an individual's degree to restrain his or her diet as a moderator and built the last hypotheses.

H8. Meal restrained degree negatively moderates the relationship between social exclusion and food decision

IV. Research Method and Data

1. Experiment Design

1.1. Method for Studying Exclusion

Researchers have designed several experimental settings to study the influence of the social exclusion. One method is to stimulate a rejection experience by having participants believe that people they have just met rejected them (Baumeister et al. (2007). In this procedure, participants are asked to choose two group members who would like to work with. The choices should be understood as the preparation for pairing off for the next task. After a group get-acquainted conversation, some of participants are told that no one wanted to work with them (Nezlek et al. 1997; Twenge et al. 2001; Twenge et al. 2003; DeWall et al. 2005). A variation of this method makes the setting of interactive task between two participants. At the beginning of the experiment, two participants exchange information about themselves, ostensibly in the preparation for the next work. Subsequently, they are told that the task has to be canceled either because the partner suddenly remembered another appointment and had to leave or either because the partner didn't want to work with them and chose not to stay (Baumeister et al. (2007). In both cases, the interactive task canceled and the participant left alone, but the former is an impersonal, random excuse, whereas the latter is a personal rejection (DeWall et al. 2006; Bushman et al. 2003).

Another manipulation of social exclusion is the procedure developed by Twenge et al. (2001). After participants finished a personality inventory, they were told that researchers provided feedback based on the result of the test. To stimulate social exclusion, the researchers gave participants in the experiment group false feedback, which predicted that they were highly likely to end up alone in life (Twenge et al. 2001; Baumeister et

al. 2002; Twenge et al. 2003; DeWall et al. 2005; Twenge et al. 2007). The point of this procedure is to make the participant believe that they will end up alone in life. The false feedback was assigned randomly so that some participants with rich networks of friends could get this result. To enhance credibility and plausibility, participants were first provided right feedback about their level of extraversion on the basis of an accurate scoring of the trait scale (Twenge et al. 2001). Subsequently, researchers added that the participant may well have many friends at present, but they will spend more and more time alone as the opportunities of forming new friendships decrease. There were two control groups in this setting. One was future belonging condition and the other was future misfortune condition. Researchers provided participants in the future belonging group with the positive feedback that the test result revealed that they were likely to spend the rest of their life surrounded by people who care about them. Also, the other control group was designed to provide unwelcome, aversive feedback that would not involve the dimension of belongingness (Baumeister et al. 2002). The participants in future misfortune group were told that they would suffer from unfortunate accident in later life. This control condition adopted to figure out whether the behavioral changes incurred by future alone condition were from the exclusion stimulation or simply from an unfortunate, undesirable forecast.

Ostracism is also an important representation of social exclusion (Williams, 1997). Ostracism behavior includes the refusal to interact with other people in a silent way. In laboratory settings, rather than

refusal to talk or interact with others (Ciarocco et al. 2001) a ball-tossing game is more frequently employed. In the game, two confederates are commanded not to speak and pretended to circumvent this by tossing a ball back and forth. Gradually the participant are excluded from the game and, at the end, two confederates ignore the participant and toss the ball only between themselves. The computerized version of this game called 'Cyberball' has been used to manipulate ostracism (Williams et al. 2000). Unlike other manipulations of laboratory ostracism, the ball tossing game and Cyberball can generate gradual series of small rejections to the participants. These series of rejections are expected to have interesting effects, by allowing emotion to build slowly over repeated trials, by invoking repeatedly violated expectations, possibly even by impacting the person's sense of control over the situation (Baumeister et al 2007). These are the common procedures of social exclusion manipulation in the laboratory settings. Frequently, many studies have used two of these methods in different experiments, based on the particular measure the each experiment aims to observe.

1.2. Procedure

For the recent study, a series of experiment was designed and conducted. The overview of the designed process is shown in Figure 3.

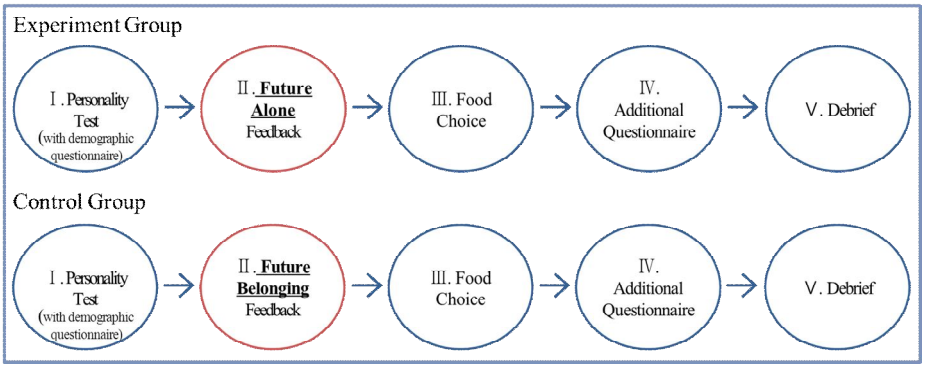

Figure 3 Experiment Procedure

Subjects were first instructed to read and sign a consent form (See Appendix 1), and they were given a survey sheet (see Appendix 2) to fill out. The survey included demographic questions such as sex, age, height, weight. Also, the survey included the 36-item Eysenck Personality Questionnaire (EPQ) (Eysenck et al. 1985) for personality feedback manipulation and the 10-item Rosenberg self-esteem scale for measuring individuals' self-esteem. For participants to understand better, the Rosenberg self-esteem scale (Rosenberg 1989) was translated into a Korean form. This disguised the original purpose of survey and provided the cover for the bogus personality feedback. Furthermore, questions whether they eat breakfast, whether they have meals regularly, whether they are on a diet, and how much they restrain their diets were asked. The survey sheet took approximately 10 minutes to complete.

Then, the participants were told that they were given the description of their personality test individually. The participants were given one of the two different feedbacks according to whether they belonged to the

experiment group or experiment group. The individual participant purportedly understood that the feedback was generated based on his or her personality questionnaire. This study referred all the bogus descriptions to Baumeister et al. (2002), and these were:

> Bogus descriptions for the experiment group (future alone group): "You are the type who will end up alone later in your life. You may have friends and relationships now, but by your mid-20s most of these will have drifted away. You may even marry or have several marriages, but these are likely to be short-lived and not continue into your 30s. Relationships don't last, and when you are past the age where people are constantly forming new relationships, the odds are you will end up being alone more and more."
>
> Bogus descriptions for the control group (future belonging): "You are the type who has rewarding relationships throughout life. You are likely to have a long and stable marriage and have friendships that will last into your later years. The odds are that you will always have friends and people who care about you."

Next, participants answered the additional questionnaire (see Appendix 2), which was measuring the participants' individual discounting rates, impulsiveness, and mood. This study asked participants discount rates to see whether there were significant differences in discount rates between the experiment and control groups - in other words, whether the hyperbolic discounting was likely to occur when the individual was excluded. This study referred the time discounting questions to Ikeda et al. (2010), and translated the questions into Korean for better

understanding. Later, the questions were converted into a scenario form for participant to commit more to given questions.

For the last, participants completed 5 questions measuring impulsiveness and 1 question measuring their current mood. This study used 5 questions from BIS-11(Barratt Impulsiveness Scale version 11) (Patton et al. 1995), and 1 question from BMIS(Brief Mood Introspection Scale) (Mayer et al. 1988). The additional questionnaire tool approximately 5 minutes to complete.

1.3. Sample Characteristics

As presented in Table 1, subjects for the experiment include 55 male and 41 female (57.3%, 42.7% each) undergraduate/graduate students, who are in their 20's. They are students of several universities around Seoul such as Seoul University, Kunkuk University, KyungHee University, and Ajou Unioversity. They participated in the experiment in exchange of extra course credit or the appointed monetary rewards. Among 96 subjects, 51% of participants (n=47) were included in experiment group, and the rest 49% of participants (n=49) were belong to control group.

Table 1 Demographic Characteristic of Participants

Category		N	Percentage
Sex	Male	55	57.30%
	Female	41	42.70%
Age	21-26	96	100%
Group	Experiment	47	51%
	Control	49	49%

Table 2 shows the number of participants who have breakfast daily. 60.4% of them (n=55) eat breakfast everyday whereas 39.6% of participants usually do not have breakfast. Over the half of the subjects have breakfast daily, and male subjects are more likely to skip breakfast (26.0%) than female subjects (13.5%).

Table 2 Number and Percentage of Having Breakfast Daily

Having Breakfast daily	N (Percentage)		
Yes	58 (60.4%)	Male	30 (31.2%)
		Female	28 (29.2%)
No	38 (39.6%)	Male	25 (26.0%)
		Female	13 (13.5%)

Table 3 presents the number of participants who have meal regularly. Among 96 participants, 57 (59.4%) answered that they have meal regularly while 39 (40.6%) responded that they have meal rather randomly. Over the half of subjects also have regular meals.

Table 3 Number and Percentage of Having Meal Regularly

Having Meal Regularly	N (Percentage)		
Yes	57 (59.4%)	Male	33 (34.4%)
		Female	24 (25.0%)
No	39 (40.6%)	Male	22 (22.9%)
		Female	17 (17.7%)

Table 4 summarizes the distribution of participants regarding being on a diet. As presented in Table 4, majority of participants (65.6%) are on

a diet. The percentage of male participants who are on a diet is 37.5%, which means that men as well as women care about their weight. However, 34.4% of participants responded that they were not on a diet.

Table 4 Number and Percentage of Being on a Diet

On Diet	N (Percentage)		
Yes	63 (65.6%)	Male	36 (37.5%)
		Female	27 (28.1%)
No	33 (34.4%)	Male	19 (19.8%)
		Female	14 (14.6%)

This study also asked subjects how much they restrain their diet. According to Table 5, about a half (47.9%) of subjects answered that they restrain their diet a little, and 13.5% of subjects responded that they highly restrain their diet. The high percentage of subjects responded positive answers (71.8%) about whether they restrain their diet. This is because the majority of participants (see Table 4) were on a diet. Meanwhile, 11.5% of participants do not restrain their diet at all, and 16.7% of participants answered that they generally do not restrain their diet.

Table 5 Responses about Diet Restriction

Restraining Degree	N	Percentage
Do not restrain at all	11	11.50%
Do not restrain much	16	16.70%
Moderately restrain	10	**10.40%**
A little restrain	46	**47.90%**
Highly restrain	13	**13.50%**

Table 6 presents the participant's BMI distribution. BMI can be calculated with one's height and weight. The formula for calculating BMI is $BMI = weight\ (kg)\ /height^2\ (m^2)$. The average of BMI is 21.37, and the average of male participants is 22.21, and that of female participants is 20.24. Generally, BMI below 18 is considered as underweight, while BMI over 25 is considered as obesity. In our sample, 18 participants could be considered as underweight and 10 participants could be considered as obese.

Table 6 Distribution of BMI

	Range	N	Mean (Male)	Mean (Female)	Mean
BMI	Below 18	18	22.21	20.24	21.37
	19- less than 21	30			
	21- less than 23	23			
	23- less than 25	14			
	Over 25	10			

1.4. Measurement Model Validation

A survey instrument needed to be developed to measure some constructs such as self-esteem, impulsiveness, and mood. This study conducted the extensive literature review to develop appropriate measurements. Table 7 presents the actual questionnaires and the literature from which construct were derived.

Table 7 Construct Operationalization

Self-esteem (Rosenberg 1965)	
Selfesteem1	On the whole, I am satisfied with myself
Selfesteem2*	At times, I think I am no good at all
Selfesteem3	I feel that I have a number of good qualities
Selfesteem4	I am able to do things as well as most other people
Selfesteem5*	I feel I do not have much to be proud of
Selfesteem6*	I certainly feel useless at times
Selfesteem7	I feel that I'm a person of worth, at least on an equal plane with others
Selfesteem8	I wish I could have more respect for myself
Selfesteem9*	All in all, I am inclined to feel that I am a failure
Selfesteem10	I take a positive attitude toward myself
Impulsiveness (Patton et al. 1995),	
Impul1*	I plan tasks carefully
Impul2*	I concentrate easily
Impul3*	I save regularly.
Impul4*	I am a careful thinker
Impul5	I act "on impulse"
Mood (Mayer et al. 1988)	
Mood1	Overall, my mood is very unpleasant(1) – very pleasant(5)

** Items reverse scored*

The previous literature agreed that self-esteem is one's reflection about their worth (Rosenberg 1965; Leary et al. 2000). The construct "self-esteem" was adopted from Rosenberg (1965), and it was defined as 'one's evaluation about his or her worth'.

Daruna et al. (1993) defined impulsiveness or impulsive action as "poorly conceived, prematurely expressed, unduly risky, or inappropriate to the situation that often results in undesirable

consequences". This study adopted the definition of impulsiveness from Daruna et al. (1993), and used Barratt Impulsiveness Scale (BIS) to measure the construct.

Mood can be defined as "longer lasting emotional state" (Biss et al, 2010; Ekman et al. 1993). It differs from emotion in that it is less situation-dependent, less specific, and less intense. This study also adopted this definition of mood, and it was measure by Brief Mood Introspection Scale (BMIS) (Mayer et al. 1988).

Table 8 presents the results of the descriptive analysis of measurements. The mean values of self-esteem are all above 3 points in the 5 Likert scale. Meanwhile, the mean values of impulsiveness are below 3 points in the 5 Likert scale except one measurement. Also, the descriptive analysis shows that overall mood of participant are moderately positive.

Table 8 Descriptive Analysis of Measurement

Construct	Measure	Mean	Std. deviation
Self-esteem	Selfesteem1	4.1563	0.79905
	Selfesteem2	3.8542	0.82052
	Selfesteem3	4.1875	0.82478
	Selfesteem4	3.9063	0.92995
	Selfesteem5	3.7083	0.95053
	Selfesteem6	3.8229	0.91760
	Selfesteem7	3.6979	0.84753
	Selfesteem8	3.6146	0.99863
	Selfesteem9	3.7188	1.06329
	Selfesteem10	3.3021	1.02721
Impulsive	Impul1	2.4479	.91617
	Impul2	2.6042	1.02062
	Impul3	3.6458	1.16057
	Impul4	2.4271	.84286

	Impul5	2.9688	.94538
Mood	Mood	3.5104	0.79465

To test the item reliability of self-esteem and impulsiveness, confirmatory factor analysis was conducted using SPSS program. Table 9 presents the result of factor analysis applying likelihood method. The initial and extracted commonality of 'Selfsteem2', 'Selfesteem4', and 'Selfesteem10' is less than 0.4, which shows these items lack commonality with other items. Also, the factor matrix rotated by Varimax method is grouped as three factors. This means that the current measurement items fail to measure one unified construct.

Table 9 1st Factor Analysis of Self-esteem Items

KMO and Bartlett test					
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			0.849		
Bartlett's Test of Sphericity			Approx. Chi-Square	342.840	
			df	45	
			Sig.	.000	
Measurement					
	Commonality		Factor Matrix(rotated)		
	Initial	Extracted	1	2	3
Selfesteem1	0.505	0.5624	0.7018	0.2636	0.0167
Selfesteem2	**0.227**	**0.2136**	0.2876	0.0361	0.3595
Selfesteem3	0.521	0.5489	0.5730	0.4386	0.1679
Selfesteem4	**0.144**	**0.1325**	0.3230	-0.052	0.1597
Selfesteem5	0.398	0.4258	0.4428	0.4759	0.0563
Selfesteem6	0.597	0.6564	0.6749	0.4346	0.1091
Selfesteem7	0.582	0.7032	0.7881	0.2496	0.1403
Selfesteem8	0.326	0.5494	-0.0467	-0.73495	-0.0839

Selfesteem9	0.558	0.6119	0.4319	0.591759	0.274257
Selfesteem10	**0.298**	**0.999**	0.02537	0.2341	0.9714

Table 10 shows the variance explained by the factors, and it also presents the measurement items fails to measure on unified construct.

Table 10 Variance Explained by the First Factor Analysis (Self-esteem)

Total Variance Explained									
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.261	42.610	42.610	1.608	16.079	16.079	2.375	23.753	23.753
2	1.205	12.051	54.661	3.223	32.225	48.305	1.775	17.749	41.502
3	1.139	11.388	66.049	.553	5.535	53.839	1.234	12.337	53.839
4	.777	7.770	73.819						
5	.652	6.519	80.337						
6	.561	5.610	85.947						
7	.432	4.323	90.270						
8	.379	3.786	94.056						
9	.317	3.168	97.224						
10	.278	2.776	100.000						
Extraction Method: Maximum Likelihood.									

To solve this problem, the items lack of commonality – 'Selfesteem2', 'Selfesteem4', and 'Selfsteem10' – are dropped. As a result, the commonality of all measurement items becomes higher than 1st factor analysis. As presented in Table 11, the 2nd factor analysis creates one unified self-esteem factor. The commonality of factors is all above 0.4 except 'Selfesteem5' and 'Selfesteem8', but the two items are not dropped. Because the factor loading of the two items is more than ±0.4, even though the commonality of the two measurements is less than 0.4. Also, KMO and Bartlett's test generates significant value

Table 11 2nd Factor Analysis of Self-esteem Items

KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.866	
Bartlett's Test of Sphericity		Approx. Chi-Square	342.840
		df	45
		Sig.	0.000
Measurement			
	Commonality		Factor Matrix
	Initial	Extracted	1
Selfesteem1	.469	0.5097	0.713920675
Selfesteem3	.511	0.56451	0.751341037
Selfesteem5	.393	0.4084	0.639061068
Selfesteem6	.585	0.64945	0.805895549
Selfesteem7	.576	0.6147	0.784000484
Selfesteem8	.321	0.1985	-0.445505306
Selfesteem9	.508	0.5192	0.720526667

Furthermore, as shown in Table 12, the eigenvalue of factor 1 is well above 1, accounting for 49.38%. Thus, the factor scores generated from 2nd factor analysis can be used for hypothesis testing.

Table 12 Variance Explained by the Second Factor Analysis (Self-esteem)

Total Variance Explained						
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.934	56.193	56.193	3.457	49.382	49.382
2	.926	13.221	69.415			
3	.585	8.361	77.776			
4	.500	7.148	84.924			
5	.428	6.119	91.043			
6	.347	4.951	95.994			
7	.280	4.006	100.000			
Extraction Method: Maximum Likelihood.						

Measurement items of mood also need to be confirmed whether the items measure one unified construct 'mood'. As a result, the 5 items of mood are proper indicators of mood. KMO and Bartlett's test generates significant value, and the commonality of items is well above 0.4. Although the commonality of 'Mood3' is less than 0.4, the factor loading of the item is 0.6390, which is valid value.

Table 13 Factor Analysis of Mood

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.774	
Bartlett's Test of Sphericity	Approx. Chi-Square	115.762

		df	10
		Sig.	.000
Measurement			
	Commonality		Factor Matrix
	Initial	Extracted	1
Mood1	.469	0.5097	0.713920675
Mood2	.511	0.56451	0.751341037
Mood3	.393	0.4084	0.639061068
Mood4	.585	0.64945	0.805895549
Mood5	.576	0.6147	0.784000484

Furthermore, as presented in Table 14, the eigenvalue of the factor 1 is more than 1, accounting for 40.34%. Thus, the factor scores from the factor analysis can be used for further hypothesis testing.

Table 14 Variance Explained by Factor Analysis (Mood)

Total Variance Explained						
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.517	50.332	50.332	2.027	40.535	40.535
2	.856	17.117	67.449			
3	.793	15.864	83.314			
4	.483	9.657	92.971			
5	.351	7.029	100.000			
Extraction Method: Maximum Likelihood.						

Meanwhile, this study needs to verify the influence of social exclusion on an individual's food decision. To do this, there should not be any possibility for other factors to affect people's food decisions. In the previous study of social exclusion, researchers have tried to verify that

many phenomena followed by exclusion experience were "actually caused" by social exclusion. Regarding this issue, other studies have doubted that the phenomena might be due to negative mood or increased impulsiveness, which is caused by social exclusion. That is, they argued that symptoms followed by exclusion experience were the indirect outcomes of social exclusion, not the direct outcomes.

To generate defending rationale against the argument, previous social exclusion studies have included the analysis of the interaction effect of other factors such as mood and impulsiveness. This study also includes the same analysis to exclude the possibility of occurring combined effect.

Table 15 presents the stepwise logistic regression model of social exclusion, impulsiveness, and the interaction term. As presented in Table 15 the coefficient of the interaction term 'Social Exclusion * Impulsiveness' 0.240 is not statistically significant at the level of 95%. It demonstrates that participants' food decision (Coke or Juice) is not affected by their impulse.

Table 15 Stepwise Logistic Regression of Social Exclusion, Impulsiveness, and Interaction Term on Food Decision (Coke vs. Juice)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Coke vs. Juice)**							
Step 1	1	0.058					
Social Exclusion				0.924	0.478	3.738	0.0265
Step 2	2	0.077	0.019				
Social Exclusion				0.929	0.481	3.728	0.027*

Impulsiveness (factor score)				-0.298	0.262	1.293	0.128
Step 3	3	0.084	0.007				
Social Exclusion				0.983	0.495	3.949	0.0235
Impulsiveness (factor score)				-0.521	0.416	1.570	0.105
Social Exclusion * Impulsiveness (factor score)				0.379	0.538	0.498	**0.240**

* $p < 0.05$

In the second food decision option, the result of stepwise logistic regression is consistent with the first food decision option. In the Table 16, the coefficient of interaction term 0.2125 is not statistically significant at the level of 95%, showing that impulse does not have effect on people's food decision.

Table 16 Stepwise Logistic Regression of Social Exclusion, Impulsiveness, and Interaction Term on Food Decision (Pastry vs. Whole grain bread)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Pastry vs. Whole grain bread)**							
Step 1	1	0.069					
Social Exclusion				0.934	0.420	4.953	0.013
Step 2	2	0.069	0.000				
Social Exclusion				.933	.420	4.940	0.013*
Impulsiveness (factor score)				-.049	.232	.044	0.417
Step 3	3	0.078	0.009				
Social Exclusion				.939	.421	4.967	0.013

Impulsiveness (factor score)	.125	.318	.154	0.3475
Social Exclusion * Impulsiveness (factor score)	-.376	.471	.636	**0.2125**

* *p < 0.05*

Furthermore, Table 17 presents the stepwise logistic regression model of social exclusion, mood, and the interaction term. As shown in Table 17 the coefficient of the interaction term 0.421 is not statistically significant at the level of 95%. It means that participants' food decision (Coke or Juice) is not affected by their mood.

Table 17 Stepwise Logistic Regression of Social Exclusion, Mood, and Interaction Term on Food Decision (Coke vs. Juice)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Coke vs. Juice)**							
Step 1	1	0.058					
Social Exclusion				0.924	0.478	3.738	0.0265 *
Step 2	2	0.062	0.004				
Social Exclusion				0.871	0.487	3.201	0.037*
Mood				-0.168	0.300	0.312	0.423
Step 3	3	0.063	0.001				
Social Exclusion				0.445	2.181	0.042	0.419
Mood				-0.241	.473	0.259	0.310
Social Exclusion * Mood				0.122	.611	0.040	**0.421**

* *p < 0.05*

Moreover, Table 18 summarizes the stepwise logistic regression model of social exclusion, mood, and the interaction term. At the choice of pastry or whole grain bread, the results displays that the coefficient of the interaction term 0.421 is not statistically significant at the level of 95%. It means that participants' food decision is not affected by their mood.

Table 18 Stepwise Logistic Regression of Social Exclusion, Mood, and Interaction Term on Food Decision (Pastry vs. Whole grain bread)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Pastry vs. Whole grain bread)**							
Step 1	1	0.069					
Social Exclusion				0.934	0.420	4.953	0.013*
Step 2	2	0.072	0.003				
Social Exclusion				.895	.428	4.374	0.018*
Mood				-.123	.273	.205	0.3205
Step 3	3	0.088	0.004				
Social Exclusion				3.111	2.055	2.292	0.065*
Mood				.178	.388	.211	0.323
Social Exclusion * Mood				-.629	.567	1.231	**0.1335**

* $p < 0.05$

Thus, according to the analysis result, it can be concluded that one's mood and impulsiveness are not related to people's food decision after exclusion experience.

V. Data Analyses and Results

1. Main Effect

To examine the effect of manipulation, data were analyzed by logistic regression model. Since the dependent variable was inherent to be qualitative (good or bad food) and it was measured as the binary choices, simple logistic regression model could generate robust results. In the first choice option between coke and fruit juice, the logistic regression generated the regression equation

$$ln(Odds) = -1.492 + 0.924(X),\ X = Social\ Exclusion.$$

As presented in Table 19, the results demonstrated that social exclusion had the significant impact on individuals' food decision (*P<0.05, one-tailed test)* and the model accounted for 5.8% of variance in the individual's food decision. According to this model, 36.18% of socially excluded people chose 'bad' food whereas 18.36% of socially rewarded people selected the bad choice.

Table 19 Logistic Regression of Social Exclusion on Food Decision (Coke vs. Juice)

Variable	Df	R^2	B	SE	Wals	*P*
Food Decision **(Coke vs. Juice)**						
Step 1	1	0.058				
Social Exclusion			0.924	0.478	3.738	0.0265*

* *p < 0.05*

The additional chi-square analysis (see Table 20) showed the significant difference in food decision between the experiment group

and the control group (*p <0.05, one-tailed test)*. Also, socially excluded people were likely to choose the harmful food.

Table 20 Cross tabulation and Chi-square Analyses on the first food decision (Coke vs. Juice)

	N				
	Juice	Coke		χ^2	*p* value
Control group	40	9		3.850	0.025*
Experiment group	30	17			
	70	26	96		

* *p < 0.05*

Also, in the second choice option - pastry or whole grain bread, logistic regression generated the regression equation

$$ln(Odds) = -0.457 + 0.934(X),\ X = Social\ Exclusion.$$

As shown in Table 21, the results proved the significant impact of social exclusion on individuals' food decision option (*P < 0.05, one-tailed test*). This model accounted for up to 6.9% of variance. Furthermore, this model estimated that 62.42% of socially excluded people chose the harmful food option whereas 39.86% of socially rewarded people selected the harmful option.

Table 21 Logistic Regression of Social Exclusion on Food Decision (Pastry vs. Whole Grain Bread)

Variable	Df	R^2	B	SE	Wals	*P*
Food Decision **(Pastry vs. Whole grain bread)**						

Step 1	1	0.069				
Social Exclusion			0.934	0.420	4.953	0.013*

* $p < 0.05$

Another chi-square analysis (see Table 22) also verified showed the statistically significant difference in food decision between the experiment group and the control group ($p < 0.05$, *one-tailed test*). The results supported the tendency for the excluded people to choose less nutritional and more hedonic food option.

Table 22 Cross tabulation and Chi-square Analyses on the Second food decision (Pastry vs. Whole Grain Bread)

	N			χ^2	*p* value
	Whole bread	Pastry			
Control group	30	19		5.044	0.0125*
Experiment group	18	29			
	48	48	96		

* $p < 0.05$

In conclusion, the analysis results showed that the first null hypothesis, *$H1_0$. Social exclusion has no influence on an individual's food decision* was to be rejected and the first alternative hypothesis, *$H1_1$. Social exclusion has influence on an individual's food* could be adopted instead.

2. Moderating Effect

2.1. Sex

To examine the interaction effect of sex on relationship between social exclusion and food decision, food decision data were analyzed using stepwise logistic regression. Table 23 summarizes the results of stepwise logistic regression of social exclusion, sex, and the interaction term. In the present study, male was coded as 1 and female was coded as 0. The regression generated the regression equation of

$ln(Odds) = -1.658 + 0.192(X_1) + 0.323(X_2) + 0.949(X_1*X_2)$, X_1 = *Social Exclusion*, X_2 = *Sex.*

Social exclusion alone accounted for up to 5.8% of variance in the first step, but the model with social exclusion and sex in the second step accounted for 9.7% of variance. The third step model with the interaction term accounted for 10.9% of variance, which was increased by 1.2%. However, the coefficient of the interaction term did not generate statistically significant p-value ($P > 0.05$, *one-tailed test*).

Table 23 Stepwise Logistic Regression of Social Exclusion, Sex, and Interaction Term on Food Decision (Coke vs. Juice)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Coke vs. Juice)**							
Step 1	1	0.058					
Social Exclusion				0.924	0.478	3.738	0.0265
Step 2	2	0.097	0.039				
Social Exclusion				0.813	0.487	2.789	0.0475
Sex				0.826	0.512	2.600	0.0503

Step 3	3	0.109	0.012				
Social Exclusion				0.192	0.841	0.052	0.410
Sex				0.323	0.742	0.190	0.3315
Social Exclusion * Sex				0.949	1.044	0.826	0.182

* $p < 0.05$

Despite the statistically non-significant test results, Figure 4 showed the moderating role of sex. In other words, male participants were more likely to consume unhealthy food than female participants after exclusion experience. Also, Figure 4 supported the overall inclination to unhealthy food decision after exclusion experience.

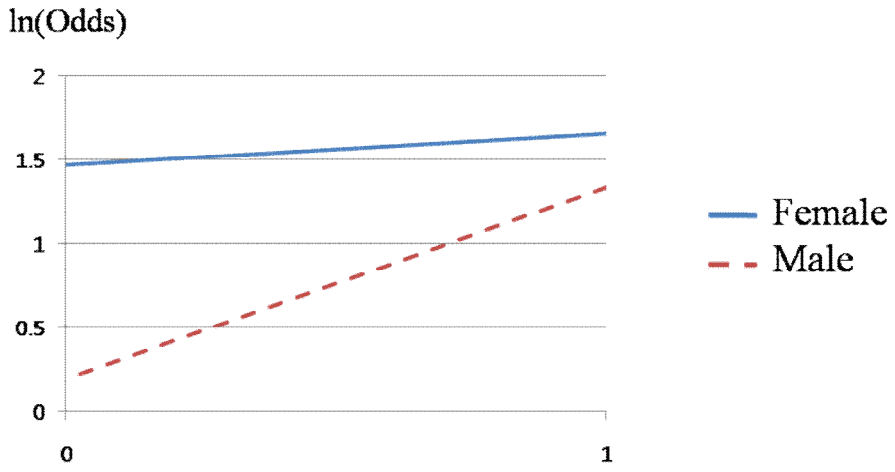

Figure 4 Moderating Effect of Sex in the choice of Coke vs. Juice

In the second option of pastry and whole grain bread, stepwise logistic regression also generated another regression equation. In the same manner, male was coded as 1 and female was coded as 0. The equation is

$$ln(Odds) = -0.08 + 0.08(X_1) + 0.807(X_2) + 1.549(X_1*X_2),\ X_1 = Social\ Exclusion,\ X_2 = Sex.$$

In the second step, there were no difference in R^2, accounting for 6.9% of variance with social exclusion and sex. The third step model with the interaction term accounted for 11.1% of variance, which was increased by 4.2% (see Table 24). Noticeably, the coefficient of interaction term showed statistical significance, supporting the moderating role of sex (*P <0.05, one-tailed test*).

Table 24 Stepwise Logistic Regression of Social Exclusion, Sex, and Interaction Term on Food Decision (Pastry vs. Whole Grain Bread)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Pastry vs. Whole grain bread)**							
Step 1	1	0.069					
Social Exclusion				0.934	0.420	4.953	0.013
Step 2	2	0.069	0.000				
Social Exclusion				0.948	0.427	4.935	0.013
Sex				-0.080	0.431	0.035	0.426
Step 3	3	0.111	0.042				
Social Exclusion				0.080	0.641	0.016	0.4505
Sex				-0.807	0.602	1.801	0.090
Social Exclusion * Sex				1.549	0.872	3.160	0.0375*

* *p < 0.05*

Figure 5 also demonstrated the significant moderating effect of sex on the relationship between social exclusion and food decision. Even

though both men and women participants tended to choose less healthy food after exclusion experiment, men were much more likely to consume unhealthy item compared to women participants. The steeper stitched line in Figure 5 displayed this clear inclination of male participants.

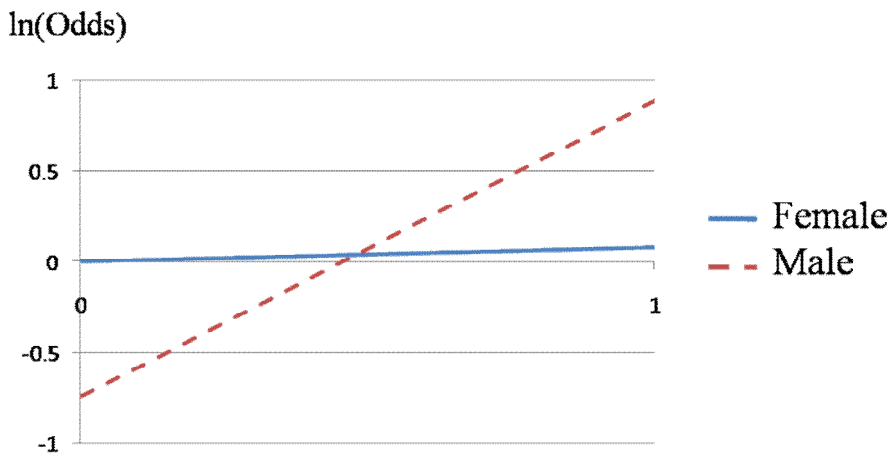

Figure 5 Moderating Effect of Sex in the choice of Pastry vs. Whole Grain Bread

According to the analysis results, the null hypothesis,

$H2_0$. Sex has no moderating effect on the relationship between social exclusion and food decision could be rejected, and the alternative hypothesis,

$H2_1$. Sex has moderating effect on the relationship between social exclusion and food decision was adopted.

2.2. Eating Breakfast

To examine the moderating role of whether people ate breakfast on

relationship between social exclusion and food decision, stepwise logistic regression was also used to analyze food decision data. Table 25 summarizes the results of stepwise logistic regression of social exclusion, eating breakfast, and the interaction term. In the regression model, eating breakfast was coded as 1 and the otherwise was coded as 0. The regression generated the regression equation of

$ln(Odds) = -1.609 + 0.99(X_1) + 0.182(X_2) - 0.094(X_1*X_2)$, X_1 = *Social Exclusion*, X_2 = *Eating Breakfast.*

Same as the first stepwise analysis, social exclusion alone accounted for up to 5.8% of variance in the first step. However, the model with social exclusion and sex in the second step accounted for 5.9% of variance, showing mere increase. The third step model with the interaction term also accounted for 5.9% of variance, which also indicated that there was no increase in accountability of the model. Also, the coefficient of the interaction term did not generate statistically significant p-value ($P > 0.05$, *one-tailed test*).

Table 25 Stepwise Logistic Regression of Social Exclusion, Eating Breakfast, and Interaction Term on Food Decision (Coke vs. Juice)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Coke vs. Juice)**							
Step 1	1	0.058					
Social Exclusion				0.924	0.478	3.738	0.0265
Step 2	2	0.059	0.001				
Social Exclusion				0.932	0.479	3.781	0.026

Breakfast				0.125	0.482	0.067	0.796
Step 3	3	0.059	0.000				
Social Exclusion				0.990	0.787	1.583	0.104
Breakfast				0.182	0.779	0.055	0.4075
Social Exclusion * Breakfast				-0.094	0.993	0.009	0.4625

* $p < 0.05$

In the choice of pastry and whole grain bread, stepwise logistic regression also generated another regression equation (see Table 26). In the same manner, eating breakfast was coded as 1 and the otherwise was coded as 0. The equation was

$$ln(Odds) = -0.452 + 1.551(X_1) - 0.008(X_2) - 1.017(X_1*X_2),\ X_1 = Social\ Exclusion,\ X_2 = Eating\ Breakfast.$$

In the second step, R^2 increased by 1.7%, accounting for 8.6% of variance with social exclusion and eating breakfast. The third step model with the interaction term accounted for 10.4% of variance, which was increased by 1.8%. Same as the first food decision option, the coefficient of interaction term showed no statistical significance, not supporting the moderating role of eating breakfast (*P > 0.05, one-tailed test*).

Table 26 Stepwise Logistic Regression of Social Exclusion, Eating Breakfast, and Interaction Term on Food Decision (Pastry vs. Whole Grain Bread)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Pastry vs.**							

Whole grain bread)							
Step 1	1	0.069					
Social Exclusion				0.934	0.420	4.953	0.013
Step 2	2	0.086	0.017				
Social Exclusion				0.918	0.422	4.723	0.015
Breakfast				-0.496	0.432	1.317	0.1255
Step 3	3	0.104	0.018				
Social Exclusion				1.551	0.707	4.805	0.014
Breakfast				-0.008	0.608	0.000	0.495
Social Exclusion * Breakfast				-1.017	0.886	1.318	0.1255

* $p < 0.05$

The results of the regression showed that the null hypothesis, *$H3_0$. Eating breakfast has no moderating effect on the relationship between social exclusion and food decision* could not be rejected.

2.3. Meal Regularity

To examine that whether people ate meals regularly could be a valid moderator, food decision data were also analyzed by using stepwise logistic regression. Table 27 summarizes the results of stepwise logistic regression of social exclusion, meal regularity, and the interaction term. In the regression model, eating meal regularly was coded as 1 and the otherwise was coded as 0. The regression generated the regression equation of

$ln(Odds) = -1.609 + 1.124(X_1) + 0.182(X_2) - 0.333(X_1*X_2)$, X_1 = *Social Exclusion*, X_2 =*Meal Regularity.*

Here, social exclusion alone also accounted for up to 5.8% of variance in the first step. The regression model with social exclusion and sex in the second step accounted for 5.8% of variance, showing no increase in accountability of the model. The third step model with the interaction term also accounted for 5.9% of variance, which also indicated that there was no increase in accountability of the model. Also, the coefficient of the interaction term did not generate statistically significant p-value (*P > 0.05, one-tailed test*).

Table 27 Stepwise Logistic Regression of Social Exclusion, Meal Regularity, and Interaction Term on Food Decision (Coke vs. Juice)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Coke vs. Juice)**							
Step 1	1	0.058					
Social Exclusion				0.924	0.478	3.738	0.0265
Step 2	2	0.058	0.000				
Social Exclusion				0.922	0.479	3.701	0.027
Meal Regularity				-0.022	0.477	0.002	0.4815
Step 3	3	0.059	0.001				
Social Exclusion				1.124	0.776	2.099	0.0735
Meal Regularity				-0.182	0.779	0.055	0.4075
Social Exclusion * Meal Regularity				-0.333	0.989	0.113	0.3685

* *p < 0.05*

In the choice of pastry and whole grain bread, stepwise logistic regression also used to analyze food decision data. Same as the choice of coke and fruit juice, eating meals regularly was coded as 1 and the

otherwise was coded as 0. The equation was

$$ln(Odds) = 0.486(X_1) - 0.742(X_2) + 0.726(X_1 * X_2),\ X_1 = Social\ Exclusion,\ X_2 = Meal\ Regularity.$$

As presented in Table 28, social exclusion alone accounted for 6.9% of variance. In the second step, R^2 increased by 1%, accounting for 7.9% of variance with social exclusion and eating breakfast. The third step model with social exclusion, meal regularity, and the interaction term accounted for 8.8% of variance, which was increased by 0.9%. Same as the first food decision option, the coefficient of interaction term showed no statistical significance (*P > 0.05, one-tailed test*), which implied that there was no moderating role of meal regularity.

Table 28 Stepwise Logistic Regression of Social Exclusion, Meal Regulariy, and Interaction Term on Food Decision (Pastry vs. Whole Grain Bread)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision **(Pastry vs. Whole grain bread)**							
Step 1	1	0.069					
Social Exclusion				0.934	0.420	4.953	0.013
Step 2	2	0.079	0.01				
Social Exclusion				0.911	0.422	4.673	0.0155
Meal Regularity				-0.379	0.429	0.778	0.189
Step 3	3	0.088	0.009				
Social Exclusion				0.486	0.651	0.556	0.228
Meal Regularity				-0.742	0.608	1.488	0.111

Social Exclusion *Meal Regularity	0.726	0.857	0.719	0.1985

* $p < 0.05$

The analysis results displayed that the null hypothesis

$H4_0$. Meal regularity has no moderating effect on the relationship between social exclusion and food decision also could not be rejected.

2.4. Diet

This study also aims to examine the moderation role of doing diet on relationship between social exclusion and food decision. To verify the interaction effect of doing diet, the stepwise logistic regression was also adopted to analyze data. Table 29 summarizes the results of stepwise logistic regression of social exclusion, diet, and the interaction term. In the present study, 'on a diet' was coded as 1 and the otherwise was coded as 0. The regression generated the regression equation of

$ln(Odds) = -1.865 + 1.546(X_1) + 1.163(X_2) – 1.769(X_1*X_2)$, X_1 = *Social Exclusion*, X_2 = *Diet.*

Same as the main effect analysis, social exclusion alone accounted for up to 5.8% of variance in the first step. Also, the model with social exclusion and sex in the second step accounted for 5.8% of variance. However, the third step model with social exclusion, diet, and the interaction term accounted for 10.2% of variance, which was increased by 4.4%. Furthermore, the coefficient of the interaction term generated statistically significant p-value ($P < 0.05$, *one-tailed test*).

Table 29 Stepwise Logistic Regression of Social Exclusion, Diet, and Interaction Term on Food Decision (Coke vs. Juice)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision (Coke vs. Juice)							
Step 1	1	0.058					
Social Exclusion				0.924	0.478	3.738	0.0265*
Step 2	2	0.058	0.000				
Social Exclusion				0.914	0.488	3.507	0.031*
Diet				0.049	0.496	0.010	0.4605
Step 3	3	0.102	0.044				
Social Exclusion				1.546	0.624	6.148	0.0065*
Diet				1.163	0.779	2.232	0.0675
Social Exclusion * Diet				-1.769	0.999	3.139	0.038*

* $p < 0.05$

Figure 6 showed the moderating role of doing diet. Even though both groups tended to choose less healthy food after exclusion experiment, participants who were not on a diet were more likely to consume unhealthy food than those who were on a diet after exclusion experience. The steeper stitched line in Figure 6 displayed this clear inclination of participants who were not on a diet. Also, Figure 3 supported the overall inclination to unhealthy food decision after exclusion experience.

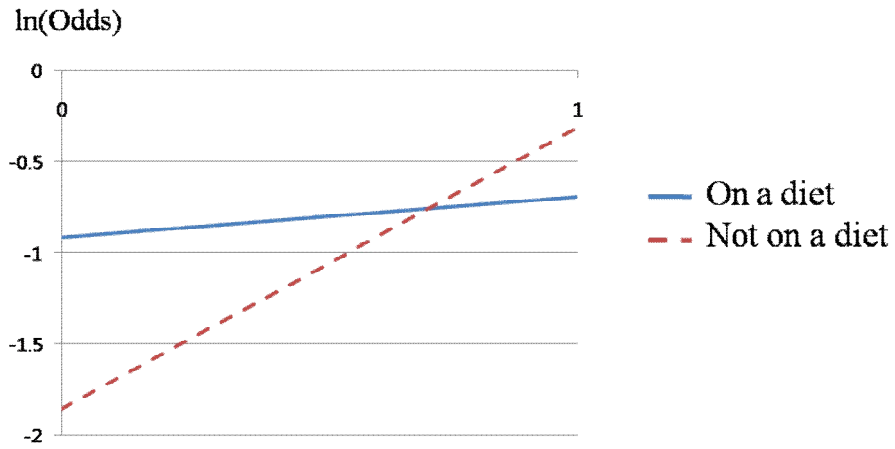

Figure 6 Moderating Effect of Diet in the choice of Coke vs. Juice

In the second option of pastry and whole grain bread, stepwise logistic regression also generated another regression equation (see Table 30). In the same manner, 'on a diet' was coded as 1 and the otherwise was coded as 0. The equation is

$$ln(Odds) = -0.163 + 1.161(X_1) - 1.447(X_2) + 0.353(X_1 * X_2),\ X_1 = Social\ Exclusion,\ X_2 = Diet.$$

Compared to the first step, the second step showed the relatively large leap in R^2, accounting for 15.4% of variance with social exclusion and sex. The third step model with the interaction term accounted for 15.5% of variance, which was increased by 0.1%. However, the coefficient of interaction term did not show the statistical significance ($P > 0.05$, *one-tailed test*).

Table 30 Stepwise Logistic Regression of Social Exclusion, Diet, and

Interaction Term on Food Decision (Pastry vs. Whole Grain Bread)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision (Pastry vs. Whole grain bread)							
Step 1	1	0.069					
Social Exclusion				0.934	0.420	4.953	0.013
Step 2	2	0.154	0.085				
Social Exclusion				1.263	0.466	7.337	0.0035
Diet				-1.223	0.494	6.137	0.0065
Step 3	3	0.155	0.001				
Social Exclusion				1.161	0.552	4.430	0.0175
Diet				-1.447	0.842	2.954	0.043
Social Exclusion * Diet				0.353	1.047	0.114	0.368

* $p < 0.05$

Unlike the significant results of Figure 6, Figure 7 failed to demonstrate the significant moderating effect of doing diet on the relationship between social exclusion and food decision. However, Figure 7 supported the overall inclination to unhealthy food decision after exclusion experience.

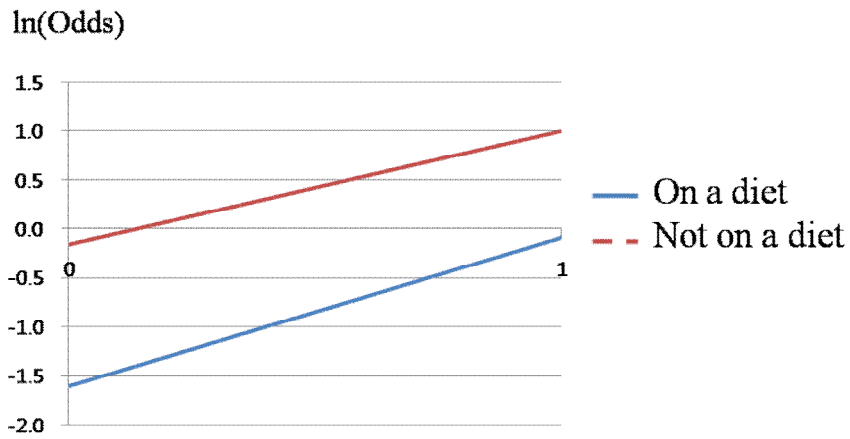

Figure 7 Moderating Effect of Diet in the choice of Pastry vs. Whole Grain Bread

According to the analysis results, the null hypothesis,

$H5_0$. Diet has no moderating effect on the relationship between social exclusion and food decision were rejected, and the alternative hypothesis,

$H5_1$. Diet has moderating effect on the relationship between social exclusion and food decision can be adopted instead.

2.5. BMI

To verify investigate whether BMI had the significant interaction effect, the additional analysis has been done using stepwise logistic regression. Table 31 summarizes the results of stepwise logistic regression of social exclusion, BMI, and the interaction term. In the present study, individuals' BMI was continuous variable, so variable coding was not necessary in this variable. The regression equation the logistic regression generated was

$ln(Odds) = -0.454 + 0.976(X_1) - 0.026(X_2) + 0.149(X_1*X_2)$, X_1 = *Social Exclusion*, X_2 = *BMI.*

Same as the main effect analysis, social exclusion alone accounted for up to 5.8% of variance. Also, the model with social exclusion and BMI in the second step accounted for 9.5% of variance, increased by 3.7%. Then, the third step model with social exclusion, BMI, and the interaction term accounted for 10% of variance. However, the coefficient of the interaction term generated not significant p-value ($P > 0.05$, *one-tailed test*).

Table 31 Stepwise Logistic Regression of Social Exclusion, BMI, and Interaction Term on Food Decision (Coke vs. Juice)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision (Coke vs. Juice)							
Step 1	1	0.058					
Social Exclusion				0.924	0.478	3.738	0.0265*
Step 2	2	0.095	0.037				
Social Exclusion				0.786	0.490	2.574	0.0545
BMI				0.137	0.086	2.541	0.0555
Step 3	3	0.100	0.005				
Social Exclusion				-1.582	4.041	0.153	0.348
BMI				0.063	0.153	0.172	0.338
Social Exclusion * BMI				0.110	0.187	0.346	0.278

* $p < 0.05$

Given the option of pastry and whole grain bread, another stepwise logistic regression model was analyzed. The equation the logistic regression generated was

$$ln(Odds) = 1.630 + 1.124(X_1) - 0.101(X_2) - 0.003(X_1 * X_2),\ X_1 = Social\ Exclusion,\ X_2 = BMI.$$

In the second step, R^2 increased by 2.2%, accounting for 9.1% of variance with social exclusion and BMI. The third step model with the interaction term also accounted for 9.1% of variance, indicating that the accountability was rarely increased. As shown in Table 32, the coefficient of interaction term showed no statistical significance, not supporting the moderating effect of BMI (*P > 0.05, one-tailed test*).

Table 32 Stepwise Logistic Regression of Social Exclusion, BMI, and Interaction Term on Food Decision (Pastry vs. Whole Grain Bread)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision (Pastry vs. Whole grain bread)							
Step 1	1	0.069					
Social Exclusion				0.934	0.420	4.953	0.013
Step 2	2	0.091	0.022				
Social Exclusion				1.063	0.438	5.896	0.0075
BMI				-0.102	0.080	1.637	0.1005
Step 3	3	0.091	0.000				
Social Exclusion				1.124	3.516	0.102	0.3745
BMI				-0.101	0.129	0.608	0.218
Social Exclusion				-	0.164	0.000	0.493

* BMI	0.003

* $p < 0.05$

2.6. Self-esteem

To examine the moderating role of individuals' self-esteem on relationship between social exclusion and food decision, stepwise logistic regression was also used. Table 33 summarizes the results of stepwise logistic regression of social exclusion, self-esteem, and the interaction term. In the regression model, the factor scores of self-esteem calculated in the measurement model validation were used to analyze the moderation effects. Since one's self-esteem, or the factor scores of self-esteem, was continuous variable, coding is unnecessary. The regression generated the regression equation of

$ln(Odds) = -1.463 + 0.895(X_1) – 0.131(X_2) + 0.134(X_1*X_2)$, X_1 = *Social Exclusion*, X_2 = *Self-esteem.*

Same as the main effect analysis, social exclusion alone accounted for up to 5.8% of variance in the first step. The model with social exclusion and self-esteem in the second step accounted for 5.8% of variance, showing that there was mere increase in accountability of the model. The third step with social exclusion, self-esteem, and the interaction term accounted for 5.9% of variance. Here, the coefficient of the interaction term did not generate statistically significant p-value ($P > 0.05$, *one-tailed test*).

Table 33 Stepwise Logistic Regression of Social Exclusion, Self-esteem,

and Interaction Term on Food Decision (Coke vs. Juice)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision (Coke vs. Juice)							
Step 1	1	0.058					
Social Exclusion				0.924	0.478	3.738	0.0265
Step 2	2	0.058	0.000				
Social Exclusion				0.903	0.491	3.379	0.033
Self-esteem (factor score)				-0.040	0.222	0.033	0.428
Step 3	3	0.059	0.001				
Social Exclusion				0.895	0.489	3.359	0.0335
Self-esteem (factor score)				-0.131	0.388	0.115	0.367
Social Exclusion * Self-esteem (factor score)				0.134	0.472	0.080	0.3885

* $p < 0.05$

In the second food choice option of pastry and whole grain bread, another stepwise logistic regression was conducted. Here, the analysis also used the factor scores of individuals' self-esteem. The equation the logistic regression generated was

$$ln(Odds) = -0.352 + 0.761(X_1) - 0.464(X_2) + 0.145(X_1 * X_2),\ X_1 = Social\ Exclusion,\ X_2 = Self\text{-}esteem.$$

In the second step, R^2 increased by 4.2%, accounting for 11.1% of variance with social exclusion and self-esteem. The third step model with the interaction term accounted for 11.2% of variance, which was increased by mere 0.1%. Same as the first food decision option, the

coefficient of interaction term showed no statistical significance, not supporting the moderating effect of self-esteem (*P > 0.05, one-tailed test*) (see Table 34).

Table 34 Stepwise Logistic Regression of Social Exclusion, Self-esteem, and Interaction Term on Food Decision (Pastry vs. Whole Grain Bread)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision (Pastry vs. Whole grain bread)							
Step 1	1	0.069					
Social Exclusion				0.934	0.420	4.953	0.013
Step 2	2	0.111	0.042				
Social Exclusion				0.770	0.433	3.160	0.0375
Self-esteem (factor score)				-0.382	0.218	3.064	0.04
Step 3	3	0.112	0.001				
Social Exclusion				0.761	0.435	3.062	0.040
Self-esteem (factor score)				-0.464	0.335	1.915	0.133
Social Exclusion * Self-esteem (factor score)				0.145	0.440	0.108	0.371

* *p < 0.05*

The results of the stepwise logistic regression model indicated that there was no moderating role of self-esteem on the relationship between social exclusion and food decision. Thus, the null hypothesis *$H7_0$. Self-esteem has no moderating effect on the relationship between social exclusion and food decision* could not be rejected.

2.7. Diet Restriction

Lastly, this study aims to verify the interaction effect of restraining diet on relationship between social exclusion and food decision. To verify the moderation effect of diet restriction, the stepwise logistic regression was also used. Table 35 summarizes the results of stepwise logistic regression of social exclusion, diet restriction, and the interaction term. In the present study, individuals' degree of restraining their diet was continuous variable. Thus, coding was not necessary in this variable either. The regression equation the logistic regression generated was

$ln(Odds) = -1.570 + 0.965(X_1) + 0.393(X_2) - 0.748(X_1 * X_2)$, X_1 = *Social Exclusion*, X_2 = *Diet Restriction.*

Same as the main effect analysis, in the first step social exclusion alone accounted for up to 5.8% of variance. Also, the model with social exclusion and sex in the second step accounted for 6.2% of variance. However, the third step model with social exclusion, diet resriction, and the interaction term accounted for 10.9% of variance, which was increased by 4.7%. Furthermore, the coefficient of the interaction term generated statistically significant p-value ($P < 0.05$, *one-tailed test*).

Table 35 Stepwise Logistic Regression of Social Exclusion, Diet Restriction, and Interaction Term on Food Decision (Coke vs. Juice)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision (Coke vs. Juice)							
Step 1	1	0.058					

Social Exclusion				0.924	0.478	3.738	0.0265*
Step 2	2	0.062	0.004				
Social Exclusion				0.919	0.479	3.688	0.0275*
Diet restriction				-0.102	0.186	0.301	0.292
Step 3	3	0.109	0.047				
Social Exclusion				3.475	1.626	4.569	0.0165*
Diet restriction				0.393	0.364	1.166	0.140
Social Exclusion * Diet restriction				-0.748	0.436	2.952	0.043*

* $p < 0.05$

Figure 8 also showed the moderating role of doing diet. Even though both groups tended to choose less healthy food after exclusion experiment, participants who did not restrain their diet were more likely to consume unhealthy food than those who highly restrain their diet after exclusion experience. The steeper stitched line in Figure 8 displayed this clear inclination of participants who did not restrain their diet. Also, Figure 8 supported the overall inclination to unhealthy food decision after exclusion experience.

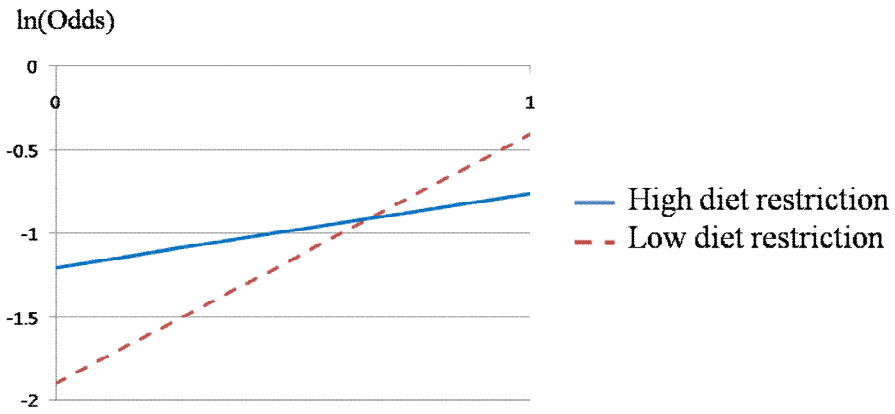

Figure 8 Moderating Effect of Diet Restriction in the choice of Coke vs. Juice

Pastry and whole grain bread choice option also generated another regression equation. The equation was

$$ln(Odds) = -0.456 + 1.012(X_1) - 0.208(X_2) - 0.453(X_1 * X_2),\ X_1 = Social\ Exclusion,\ X_2 = Diet\ Restriction.$$

Compared to the first step, the second step showed the relatively large leap in R^2, accounting for 13.9% of variance with social exclusion and sex. The third step model, which was included the interaction term accounted for 15.7% of variance (see Table 36). However, the coefficient of interaction term did not show the statistical significance ($P > 0.05$, *one-tailed test*).

Table 36 Stepwise Logistic Regression of Social Exclusion, Diet Restriction, and Interaction Term on Food Decision (Pastry vs. Whole Grain Bread)

Variable	Df	R^2	ΔR^2	B	SE	Wals	*P*
Food Decision (Pastry vs. Whole grain bread)							
Step 1	1	0.069					
Social Exclusion				0.934	0.420	4.953	0.013*
Step 2	2	0.139	0.07				
Social Exclusion				0.965	0.434	4.951	0.013*
Diet restriction				-0.415	0.183	5.131	0.012*
Step 3	3	0.157	0.018				
Social Exclusion				2.532	1.429	3.139	0.038*
Diet restriction				-0.208	0.249	0.698	0.2015
Social Exclusion * Diet restriction				-0.453	0.387	1.370	0.121

* $p < 0.05$

Despite the statistically non-significant test results, Figure 9 showed the moderating role of diet restriction. In other words, people who did not restrain their diet were more likely to consume harmful food than those who highly restrain their diet, especially after exclusion experience. Also, Figure 9 supported the overall inclination to unhealthy food decision after exclusion experience.

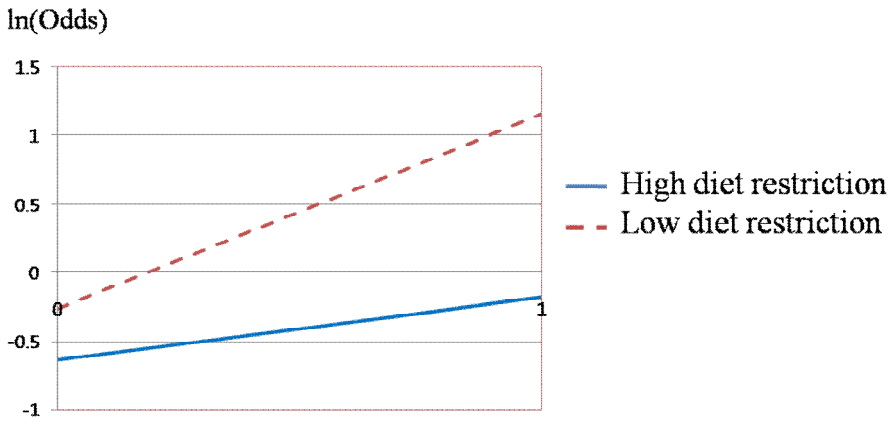

Figure 9 Moderating Effect of Diet Restriction in the choice of Pastry vs. Whole Grain Bread

According to the analysis results, the null hypothesis,

$H8_0$. Meal Restrained degree has no moderating effect on the relationship between social exclusion and food decision could be rejected, and the alternative hypothesis,

$H8_1$. Meal Restrained degree negatively moderates the relationship between social exclusion and food decision was adopted

VI. Discussions

1. Summary of Findings

Based on Twenge et al. (2003) and Chandon et al. (2007), this study aims to investigate the influence of social exclusion on people's food decisions. The theoretical background of this study is the cognitive biases caused by social exclusion experience. Since the Baumeister et al. (1995) proposed that human beings have the strong and pervasive "need to belong", large volume of studies has demonstrated the

outcomes of social exclusion. Among these studies, Twenge et al. (2003) proved the social exclusion experience was related to the excluded people's impaired cognitive processing. Also, Chandon et al. (2007) demonstrated that individual differences in cognitive biases affected the individuals' food decisions. Thus, the present study incorporates the results from the prior study and develops the research model (See Figure 2).

The main goal of the present study was to demonstrate the influence of social exclusion on people's food decisions. In addition, the moderating roles of sex, individual's meal patterns, BMI, self-esteem level, and diet restriction were to be confirmed. To verify the hypotheses, the experiment was designed, and 96 participants were collected. The data from the experiment were analyzed by using logistic regression model, and stepwise logistic regression was applied to verify the interaction effects of moderators.

The results showed that exclusion experience have influence on individuals' food decisions. People anticipating future loneliness were more likely to choose unhealthy foods than those anticipating future belonging life. Also, the stepwise logistic regression displayed that the main effect could be moderated by 'Sex', 'Diet', and 'Diet restriction'. However, the interaction effects of 'Breakfast', 'Meal Regularity', 'BMI', and 'Self-esteem' were not statistically significant. The Table 37 presents the summary of hypothesis testing. The further explanations for each hypothesis are followed in detail.

Table 37 Summary of Hypothesis Testing

	Hypothesis	Support	p-value
H1	Social exclusion has influence on an individual's food decision	Yes	$p<0.05$
H2	Sex moderates the relationship between social exclusion and food decision	Yes	$p<0.05$
H3	Eating breakfast moderates the relationship between social exclusion and food decision	No	-
H4	Meal regularity moderates the relationship between social exclusion and food decision	No	-
H5	Doing diet moderates the relationship between social exclusion and food decision	Yes	$p<0.05$
H6	BMI positively moderates the relationship between social exclusion and food decision	No	-
H7	Self-esteem positively moderates the relationship between social exclusion and food decision	No	-
H8	Meal restrained degree negatively moderates the relationship between social exclusion and food decision	Yes	$p<0.05$

H1. Social exclusion has influence on an individual's food decision

As shown in Table 19 and Table 21, the main effect of the research model was verified. The logistic regression model demonstrated the significant results in both food decision options – Coke vs. Juice, Pastry vs. Whole grain bread. The results proved that socially excluded people tend to consume unhealthy foods compared to the socially rewarding

people. This finding could expand the study regarding the influences of social exclusion. Even though the possible outcomes of social exclusion have been extensively investigated, its impacts on food decisions, and health status caused by the decisions, have rarely observed.

H2. Sex moderates the relationship between social exclusion and food decisions

As shown in Table 24, the moderating role of sex on the causal relationship between social exclusion experience and food decisions was proved. The stepwise logistic regression model generated the significant results in the option of Pastry vs, Whole grain bread. Even though the result in the Coke vs. Juice option did not generate the significant p-value, the detailed analysis showed the same interaction effect of sex (see Figure 4 and Figure 5). In both option, the results demonstrated that both men and women tended to choose less healthy foods after exclusion experience, and this tendency was stronger in male population. This result was counter intuitive in that previous studies have been showed emotional venerability of women. However, the result indicates that men could be more venerable in case of exclusion experience, and future study needs to be conducted for generalization.

H3. Eating breakfast moderates the relationship between social exclusion and food decision

H4. Meal regularity moderates the relationship between social exclusion and food decision

Meanwhile, the moderating role of meal patterns – Eating breakfast and Meal regularity proved to be insignificant (see Table 25, Table 26, Table 27, and Table 28). The stepwise logistic regression model generated the insignificant results in both food decision options. This indicated that whether having breakfast and having meals regularly did not moderate the main effect. This result might be due to the materials of the experiment. The foods given in the experiment – coke, juice, pastry, and whole grain bread were rather snack-type foods than meal-type. The results could be different if other food options were applied, and future study can address the interaction effect of meal patterns.

H5. Being on a diet moderates the relationship between social exclusion and food decision

As presented in Table 29 and Figure 6, the interaction effect of being on a diet on the main effect was proved. The stepwise regression model showed statistical significance in the option of Coke vs. Juice. In both option, the analysis model proved that excluded people tended to choose the unhealthy food regardless of being on a diet. However, this tendency was more salient when the individual was on a. The reason

why the same tendency has not repeated in the option of Pastry vs. Whole grain bread needs to be investigated by future study.

H6. BMI positively moderates the relationship between social exclusion and food decision

Furthermore, the interaction effect of individual BMI proved to be insignificant (see Table 31 and Table 32). The stepwise logistic regression model showed the insignificant results in both food decision options. Although the previous findings demonstrated that BMI had the association with various food-related factors, in this study the results indicated that one's BMI was not moderating the main effect. The meaning of the result might imply that exclusion experiences were powerful regardless of one's BMI. However, future study with more sophisticated design could address the interaction effect of meal patterns.

H7. Self-esteem positively moderates the relationship between social exclusion and food decision

As shown in Table 34 and Table 35 the moderating effect on self-esteem also proved to be in significant. The stepwise logistic regression model analyzed that the coefficient of the interaction was not statistically significant. This indicated that the exclusion experiences have an influence on an individual's food decisions regardless of one's

self-esteem level.

H8. Meal restrained degree negatively moderates the relationship between social exclusion and food decision

As presented in Table 35 and Table 36, the moderating role of diet restriction on the causal relationship between social exclusion experience and food decisions was proved. The stepwise logistic regression model generated the significant results in the option of Coke vs. Juice. Even though the result in the Pastry vs, Whole grain bread option did not generate the significant p-value, the detailed analysis showed the same interaction effect of sex (see Figure 8 and Figure 9). In both option, the results demonstrated that both high and low restriction group tended to choose less healthy foods after exclusion experience, and this tendency was stronger when people restrained their die. This result was counter intuitive in that people who restrained their diet chose unhealthy and high-fat food. Future study could address the mechanism behind this phenomena.

2. Contributions

The findings of this study can provide several implications to both academia and practitioners. First, this study could expand the current understandings of the consequences of social exclusion. Since Baumeister et al. (1995) suggested the concept of “need to belong”, many previous studies have developed the cumulative understandings

about social exclusion and it outcomes. However, prior study has not investigated the influence of social exclusion on an individual's food decisions. Belonging and consuming foods are both the essential parts of outlives. Thus, the findings that one can affect another could be worth further investigating. Also, the findings were empirically demonstrated for the first time.

Furthermore, many studies have investigated how chemosensory, cognitive, and environmental factors could influence the consumption amount of food. In other words, existing studies tended to focus on how much people eat, rather than what we eat. This study, thus, aims to observe what people eat after the exclusion experience.

Also, this study aims to specify the influence of social exclusion on people's food decision by adopting several moderators – sex, meal patterns, BMI, self-esteem, and diet restriction. These moderators made it possible to specify the results according to demographic or lifestyle factors, and these specified results could be better applied to real world.

3. Limitation and Future Research Directions

Despite the detailed effort to build robust research model, the present study also inevitably retains limitations. Firstly, the study conducted experiment with only two choice options – Coke vs. Juice, Pastry vs. Whole grain bread. These options could be too simple to encompass people's food decisions. Thus, it would be better for future research addressing people's food decision to include more sophisticated food

options.

Also, even though meal pattern variables – having breakfast and meal regularity have been proved to be relevant factors to people's food decision, this study failed to find the significant interaction effect. This might be because the food decision options used for this study were snack-type food. Thus, future study could include broader range of food options for more general results.

Moreover, 96 samples were relatively small to conduct logistic regression. Although logistic regression model guarantees robust analysis results, it requires large sample size approximately 400 for the 2 by 2 design. Thus, future research using logistic regression needs to collect large sample for significant analysis results.

Lastly, 96 samples are all composed of 20s population. The results could be the representative of people in their 20s rather than the representative of all, and the application to other age groups could be limited. Thus, future research studying social exclusion and food decision needs to take efforts on sample composition and more sophisticated experiment design.

Appendix

Appendix 1 Consent form

연구 참가 동의서

본 인 _____은(는) 2012년 ____월 ____일 농업생명과학대학 정보 경영 및 마케팅 연구실에서 실시하는 라이프스타일 연구 실험에 참여함에 있어 다음 사항을 준수할 것에 동의합니다.

1. 본 인은 해당 연구에 자발적으로 참여하였으며, 연구자의 지침을 따라 실험에 참여하겠습니다.

2. 본 인은 해당 연구와 관련된 실험에 성실한 자세로 참여하겠습니다.

3. 본 인은 실험 후에도 연구에 대한 정보를 타인에게 누설하지 않겠습니다.

_____년 _____월_____일

성명: _____

서명 _____

정보 경영 및 마케팅 연구실 귀하

Appendix 2 Survey Questionnaire

라이프 스타일에 따른 성격 유형과 소비성향 연구

안녕하십니까?
라이프 스타일에 따른 성격 유형 및 소비 성향 연구에 참여해주셔서 감사합니다.
참여자들께서는 오늘 설문지 작성 후 분석 결과에 따른 간단한 상담(5 분 정도 소요)을 받으실 것입니다.
오늘 실험은 **설문지 작성 → 성격 유형 상담 → 추가 설문 작성 및 경품 참여**의 순서로 이루어 지게 됩니다.
참여자들의 신원은 절대 공개되지 않으며, 답변 역시 데이터 분석을 통해 통합된 결과로서 보고될 뿐 참여자 개별 정보가 사용되지 않을 것을 약속 드립니다.
다시 한번 실험 참여에 감사 드리며, 성의 있는 설문 답변 부탁 드립니다.

<u>응답자에 관한 사항</u>

응답자 성명 : _____

이메일 주소 : _____

핸드폰 : _____

농업생명과학대학 정보 경영 및 마케팅 연구실

라이프 스타일 검사 항목

L1 귀하의 성별은 무엇입니까?

남자	1
여자	2

L2 귀하는 평소에 아침 식사를 하십니까? (예/아니오)

예	1
아니오	2

L3 귀하는 평소에 식사를 규칙적으로 하는 편입니까? (예/아니오)

예	1
아니오	2

L4 귀하의 신장은 얼마입니까?

cm

L5 귀하의 체중은 얼마입니까?

kg

L6 귀하의 음식을 선택할 때 가장 중요하게 고려하는 사항은 무엇입니까?

맛	1
영양	2
음식의 모양새	3
음식의 양	4

다음 문항에 대해 5점 척도로 답해주시기 바랍니다. 매우 그렇지 않다는 1점, 매우 그렇다는 5점입니다.						
L7	나는 나의 삶에 만족한다.	1	2	3	4	5
L8	다시 태어난다 해도, 나는 지금처럼 살아갈 것이다.	1	2	3	4	5
L9	나는 내가 다른 사람들처럼 가치 있는 사람이라고 생각한다.	1	2	3	4	5
L10	나는 좋은 성품을 가졌다고 생각한다.	1	2	3	4	5
L11	나는 대체적으로 실패한 사람이라는 느낌이 든다.	1	2	3	4	5
L12	나는 다른 사람들만큼 일을 잘 할 수가 있다.	1	2	3	4	5
L13	나는 자랑할 것이 별로 없다.	1	2	3	4	5
L14	나는 내 자신에 대하여 긍정적인 태도를 가지고 있다.	1	2	3	4	5
L15	나는 내 자신에 대하여 대체로 만족한다.	1	2	3	4	5
L16	나는 내 자신을 좀 더 존중할 수 있으면 좋겠다.	1	2	3	4	5
L17	나는 가끔 내 자신이 쓸모 없는 사람이라는 느낌이 든다.	1	2	3	4	5
L18	나는 때때로 내가 좋지 않은 사람이라고 생각한다.	1	2	3	4	5

L19 현재 다이어트 중이십니까?

예	1
아니오	2

L20 귀하는 평소 체중 관리에 얼마나 신경 쓰십니까?

아예 신경 쓰지 않는다.	1
별로 신경 쓰지 않는다	2
보통이다.	3
조금 신경 쓴다.	4
매우 신경 쓴다	5

성격 유형 관련 질문

다음 문항에 대해 5점 척도로 답해주시기 바랍니다. **매우 그렇지 않다는 1점, 매우 그렇다는 5점입니다.**

P1	나는 매우 말이 많은 편이다.	1	2	3	4	5
P2	나는 친구를 쉽게 사귄다.	1	2	3	4	5
P3	나는 자기중심적이다.	1	2	3	4	5
P4	빚이 있어도 걱정하지 않는다.	1	2	3	4	5
P5	나는 에너지가 넘친다.	1	2	3	4	5
P6	나는 최악의 상황을 걱정한다.	1	2	3	4	5
P7	나는 자주 좌절을 느낀다.	1	2	3	4	5
P8	나는 자주 죄책감을 느낀다.	1	2	3	4	5
P9	나는 사람들과 함께 있으면 조용하다.	1	2	3	4	5
P10	나는 늘 긴장되어 있다.	1	2	3	4	5
P11	나는 걱정이 잦다.	1	2	3	4	5
P12	나는 사회적 모임을 즐긴다.	1	2	3	4	5
P13	나는 사람에게 다가가는 데 문제가 없다.	1	2	3	4	5
P14	나는 상황에 맞게 행동한다.	1	2	3	4	5
P15	나는 사람들과 함께 있을 때 편안하다.	1	2	3	4	5
P16	나는 사람들에게 무례하지 않으려고 노력한다.	1	2	3	4	5
P17	나는 걱정 때문에 괴롭다.	1	2	3	4	5
P18	나는 과거의 실수에 얽매이는 경향이 있다.	1	2	3	4	5
P19	나는 그룹에 속한 상태가 좋다.	1	2	3	4	5
P20	나는 종종 외로움을 느낀다.	1	2	3	4	5
P21	나는 매우 예민하다.	1	2	3	4	5
P22	나는 불안해 하는 경향이 있다.	1	2	3	4	5
P23	나는 규칙보다는 나의 방식을 선호한다.	1	2	3	4	5
P24	나는 권위를 존중한다.	1	2	3	4	5
P25	나는 사람들을 즐겁게 하는 방법을 알고 있다.	1	2	3	4	5
P26	나는 모르는 사람들과 있을 때보다 아는 사람들과 있을 때 편안하다.	1	2	3	4	5
P27	나는 사람들이 나를 두려워했으면 좋겠다.	1	2	3	4	5
P28	나는 사람들이 과하게 주의한다고 생각한다.	1	2	3	4	5
P29	나는 때때로 이유 없이 큰 슬픔을 느낀다.	1	2	3	4	5
P30	나는 위협적이고 싶다.	1	2	3	4	5
P31	나는 새로운 사람을 만나는 것을 즐긴다.	1	2	3	4	5
P32	나는 에너지가 넘치는 환경에 있는 것을 좋아한다.	1	2	3	4	5
P33	나는 외향적이다.	1	2	3	4	5
P34	나는 냉담한 사람이다.	1	2	3	4	5
P35	차라리 규정대로 하겠다.	1	2	3	4	5
P36	나는 기분 변화가 매우 심하다.	1	2	3	4	5

라이프 스타일 연구 (추가 설문)

당신은 한 회사의 소액 주주입니다.
당신의 회사가 수익이 좋아 이를 주주들에게 배분하려고 합니다. 2일 뒤 당신이 받게 될 배당은 십 만원 (₩100,000) 입니다. 그런데 당신의 회사는 임시 기금을 마련하고 있는데 당장 받게 될 배당을 연기하게 되면 9일 뒤 ( )의 금액으로 돌려준다고 합니다. 당신이 당장의 배당을 포기할 조건을 모두 선택해주시기 바랍니다..

① 9일 뒤 ₩99,808 (연 이자율 -10%)
② 9일 뒤 ₩100.000 (연 이자율 0%)
③ 9일 뒤 ₩100,192 (연 이자율 10%)
④ 9일 뒤 ₩100,393 (연 이자율 20%)
⑤ 9일 뒤 ₩100,959 (연 이자율 50%)
⑥ 9일 뒤 ₩101,918 (연 이자율 100%)
⑦ 9일 뒤 ₩103,836 (연 이자율 200%)
⑧ 9일 뒤 ₩105,753 (연 이자율 300%)

당신은 회사로부터 소액 대출을 받고자 합니다.
당신이 회사로부터 빌리고자 하는 금액은 백 만원 (₩1,000,000) 입니다. 당신이 돈이 필요한 시점인 1개월 뒤 백 만원을 빌릴 경우 13개월 뒤 회사에 갚아야 할 돈은 ( )입니다.
당신이 회사로부터 돈을 빌릴 조건을 모두 선택해주시기 바랍니다.

① 13개월 뒤 ₩900,000 (연 이자율 -10%)
② 13개월 뒤 ₩1,000.000 (연 이자율 0%)
③ 13개월 뒤 ₩1,100,000 (연 이자율 10%)
④ 13개월 뒤 ₩1,200,000 (연 이자율 20%)
⑤ 13개월 뒤 ₩1,500,000 (연 이자율 50%)
⑥ 13개월 뒤 ₩2,000,000 (연 이자율 100%)
⑦ 13개월 뒤 ₩3,000,000 (연 이자율 200%)
⑧ 13개월 뒤 ₩4,000,000 (연 이자율 300%)

당신은 한 회사의 소액 주주입니다. 당신의 회사가 수익이 좋아 이를 주주들에게 배분하려고 합니다. 90일 뒤 당신이 받게 될 배당은 십 만원(₩100,000)입니다. 그런데 당신의 회사는 그 시기에 기금 마련을 계획하고 있습니다. 90일 뒤 받게 될 배당을 연기하게 되면 97일 뒤 ( )의 금액으로 돌려준다고 합니다. 당신이 배당을 연기할 조건을 모두 선택해 주시기 바랍니다.

① 97일 뒤 ₩99,808 (연 이자율 -10%)
② 97일 뒤 ₩100.000 (연 이자율 0%)
③ 97일 뒤 ₩100,192 (연 이자율 10%)
④ 97일 뒤 ₩100,393 (연 이자율 20%)
⑤ 97일 뒤 ₩100,959 (연 이자율 50%)
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당신이 회사로부터 돈을 빌릴 조건을 모두 선택해주시기 바랍니다.

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다음 문항에 대해 5 점 척도로 답해주시기 바랍니다. 매우 그렇지 않다는 1 점, 매우 그렇다는 5 점입니다.		
A1	나는 일을 신중하게 처리한다.	1 2 3 4 5
A2	나는 집중을 잘한다.	1 2 3 4 5
A3	나는 정기적으로 저축을 한다.	1 2 3 4 5
A4	나는 신중하게 생각하는 사람이다.	1 2 3 4 5
A5	나는 충동적으로 행동한다.	1 2 3 4 5
A6	현재 대체적인 나의 기분은 매우 좋지 않다 1 점, 매우 좋다 5 점	1 2 3 4 5

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