The Effects of Environmental Cues on Choice of Healthy Foods: Group Membership as a Moderator

by

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ABSTRACT

THE EFFECTS OF ENVIRONMENTAL CUE ON CHOICE OF HEALTHY FOODS: GROUP MEMBERSHIP AS A MODERATOR

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This research investigated environmental cues and its effect on healthy food choice, while considering the moderator of group membership of previous fictitious participants. This research found that an environmental cue denoting a healthy snack led participants to choose kale chips more often and led participants to choose more kale chips than participants who were exposed to an environmental cue denoting an unhealthy snack. Group membership was not found to moderate the relationship between environmental cues and food choice, as regardless of a previous participants group membership (in-group vs. out-group) participants were influenced by the environmental cue. These results demonstrate the strength of environmental cues in influencing a consumer’s choice, which provides important theoretical and managerial implications, which will be discussed.
DEDICATION

This book is affectionally dedicated to Mom, Dad and Melissa whose interest in this, as in all my ventures was never less than my own.
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I am so grateful to everyone who helped me through this journey. Big or small, you all deserve many thanks.

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# TABLE OF CONTENTS

Abstract .................................................................................................................................................. ii
Dedication ............................................................................................................................................... iii
Acknowledgements ................................................................................................................................. iv
Table of Contents .................................................................................................................................... v
List of Tables .......................................................................................................................................... vii
List of Figures .......................................................................................................................................... viii
List of Appendices ................................................................................................................................. ix

1 CHAPTER 1: Introduction .................................................................................................................. 1

2 CHAPTER 2: Literature review ........................................................................................................... 5

2.1 Social Influence ................................................................................................................................. 5

2.1.1 Live Confederate .......................................................................................................................... 9

2.1.2 Persuasive Message Denoting Social Norms ............................................................................... 23

2.1.3 Environmental Cue ..................................................................................................................... 34

2.2 Moderators of Social Influence ..................................................................................................... 42

2.2.1 Desire to Affiliate ....................................................................................................................... 43

2.3 Directions for Current Research .................................................................................................... 66

3 CHAPTER 3: Research Questions and Hypothesis .......................................................................... 71

3.1 Main Effect Hypothesis .................................................................................................................... 71

3.2 Interaction Effect Hypothesis .......................................................................................................... 72

4 CHAPTER 4: Research Methodology ................................................................................................ 73

4.1 Study 1: Pre-test ............................................................................................................................... 73

4.1.1 Participants ................................................................................................................................. 74
4.1.2 Methods.............................................................................................................. 74
4.1.3 Measures............................................................................................................. 75
4.1.4 Results.................................................................................................................. 77
4.1.5 Discussion............................................................................................................ 82
4.2 Study 2: Main Study.............................................................................................. 82
  4.2.1 Participants......................................................................................................... 83
  4.2.2 Methods.............................................................................................................. 83
  4.2.3 Measures............................................................................................................ 87
  4.2.4 Results................................................................................................................ 89
5 CHAPTER 5: Discussion............................................................................................. 105
  5.1 General Discussion............................................................................................... 105
  5.2 Contributions and Implications ............................................................................ 113
  5.3 Limitations and Future Research.......................................................................... 115
  5.4 Conclusion.............................................................................................................. 117

References.................................................................................................................... 119
Appendices.................................................................................................................... 126
LIST OF TABLES

Table 1: Product Type, Standard Measurement and Calorie Anchor ........................................ 77
Table 2: Manipulation Check - Did Participants Notice the Bag Left Behind? .......................... 90
Table 3: One-Sample Test – “Did Participants Notice the Bag Left Behind?” ........................ 90
Table 4: Manipulation Check – “What was the Previous Participants Choice?” ........................ 91
Table 5: Normality Test of No. of Kale Chips .............................................................................. 91
Table 6: Correlations of Significant Variables ............................................................................. 93
Table 7: Classification Table of Regression Analysis of Binary Choice ...................................... 96
Table 8: Variables in the Equation for Regression Analysis for Binary Choice ......................... 97
Table 9: Logistic Regression Probabilities .................................................................................. 98
Table 10: ANOVA of No. of Kale Chips Chosen ......................................................................... 101
Table 11: Descriptive Statistics of No. of Kale Chips Chosen ..................................................... 102
Table 12: Pairwise Comparisons of Environmental Cue and Group Membership ..................... 102
Table 13: ANCOVA Analysis of No. of Kale Chips Chosen ........................................................ 104
LIST OF FIGURES

Figure 1: Conceptual Map of Main Effect Hypothesis.............................................................. 71
Figure 2: Conceptual Map of Interaction Effect Hypothesis......................................................... 72
Figure 3: Information Blurb for Dark Leafy Greens ................................................................. 75
Figure 4: Pictures of Kale Chips (left) vs. Potato Chips (right)................................................... 75
Figure 5: Information Blurb and Picture on TV Screen ............................................................. 84
Figure 6: Illustration of "Garbage" Bin ..................................................................................... 86
Figure 7: Ticket with Information Blurb .................................................................................... 86
Figure 8: Histogram of No. of Kale Chips Chosen................................................................. 92
Figure 9: Probabilities of Selecting Kale Chips in Each Condition............................................. 99
Figure 10: Estimated Marginal Means of No. of Kale Chips Chosen ...................................... 103
LIST OF APPENDICES

APPENDIX A: Pre-Study Methods - Mixed Berry Pomegranate Juice ........................................ 126
APPENDIX B: Pre-Study Methods - Avocado Brownie ................................................................. 127
APPENDIX C: Pre-Study Methods - Mixed Berry Juice Naturally Sweetened ............................. 128
APPENDIX D: Pre-Study Methods - Mixed Berry Acai Juice ......................................................... 129
APPENDIX E: Pre-Study - Measures .............................................................................................. 130
APPENDIX F: Pre-Study - Results .................................................................................................. 133
APPENDIX G: Main Study - Methods .............................................................................................. 136
APPENDIX H: Main Study - Measures ............................................................................................ 137
APPENDIX I: Main Study Results - Normality Tests ................................................................. 138
APPENDIX J: Main Study - Correlations Table ............................................................................. 139
APPENDIX K: Main Study - Regression Analysis .......................................................................... 140
APPENDIX L: Main Study - ANOVA Analysis .............................................................................. 141
1 CHAPTER 1: Introduction

You are on your lunch break and you start to make your way to the break room. You packed a homemade meal and have chosen to pick a drink from the supply that the office breakroom has. You start to make your way to the breakroom, and you notice that upper management personnel are leaving as you are coming in. You head to the fridge and grab your packed lunch, you forgot to pack a fork, and go to the drawer which is beside the garbage bin, as you open the drawer you notice that the garbage bin is full of empty soda cans. The empty cans look as if they were just placed into the bin by the upper management personnel who were in the room before you. Upper management are notorious for being unhealthy and tend to frown upon lower management personnel, which you are. You grab your fork, place it on top of your food container and go to the fridge again to make a drink choice. As you open the fridge you see the office drink selection to be vitamin water or soda and now you must choose between the two. This short vignette is indicative of the choices that the general population makes daily. There is a desire to purchase and consume foods and drinks based on our needs and wants, but our decisions are not made solely on our personal desires. Our decisions are also influenced by a desire to affiliate to a group that you share membership with or disassociate with an out-group. Our choices can express our identity, and signal to others that we are a part of a group and we want to be associated with that group. Thusly, the choices we make carry more importance than simply choosing a meal to eat.

How do others eating patterns influence our own, and how does a desire to affiliate with a social group play a role in the decision-making process? How can these social influences be harnessed to create a positive change in consumer’s food decisions? The ability to answer these
questions will aid in the creation of interventions that target the obesity crisis that Canada is facing today.

As per the 2014 Canadian census, based on self-reported measures of height and weight, 20.2% of Canadians aged 18 and older, were classified as obese (Statistics Canada, 2015). The obesity trend is said to be increasing, as per a 2015 census, those who are classified as overweight or obese was 65% of the population (Statistics Canada, 2018). Most Canadians are aware of the obesity rates, yet they are not aware of what has been done to increase consumption of unhealthy food and subsequently decrease the consumption of healthy foods. There are four key factors that can be found in the food environment that will lead consumers to overeat. The four factors are the availability of high caloric foods, easy accessibility to these high caloric foods, the presence of large portion sizes and pricing and marketing strategies that promote the purchase and consumption of these foods (Poelman, Vet, Velema, Seidell, & Steenhuis, 2014). These four factors promote the overconsumption of unhealthy foods and drinks and the under consumption of healthy foods. Under consumption of healthy foods is integrated into a groups social norm, which is thusly normalized and perpetuated throughout the group.

The current research environment is interested in pinpointing accessible ways to mitigate the under consumption of healthy foods using multifaceted interventions such as using persuasive message in the form of a poster. The present research will consider social norms as a means of influencing consumption patterns, using social modelling and a desire to affiliate with a social group.
Extensive research has identified that social influence plays a role in a consumer’s decision-making process. Robinson & Field (2015) found that participants were aware about what others have eaten, and they would subsequently modify their consumption patterns to match those of the dining partner. This is consistent with social influence literature that has consistently found that participants will increase or decrease their consumption to match; to some extent, their dining partner.

Hermans, Engels, Larsen & Herman (2009) proposed that the extent to which modelling occurs might be influenced by the nature of the relationship between the co-eaters. The relationship between co-eaters will be evident in the desire to affiliate with the co-eater. The desire to affiliate will be evidenced when an individual wants to ingratiate themselves with the co-eater as they wish to signal a shared group membership. The desire to affiliate will moderate social modelling, such that modelling of consumption should be evidenced if there is a desire to affiliate to a group. The extent to which an individual identifies with a group will determine the extent of modelling that will occur.

The present research looks to consider social norms, to influence the purchase of food and drinks, while considering the moderating influence of affiliation and shared group membership. Interventions to promote the consumption of healthy foods and dissuade the overconsumption of unhealthy foods, can be a stepping stone towards a healthier eating environment in Canada.

Research into social norms and desire to affiliate will be explored to build a foundation on social influence and its effects on consumption. Social influence will be explored using three
different contexts; live confederate, persuasive messages and remote confederate as it pertains to unhealthy and healthy foods. This will build a foundation on the influence of social influence on overconsumption of unhealthy and healthy foods. Moderators of social influence will be explored to develop an understanding of what will increase or decrease instances of social modeling. Lastly, desire to affiliate will be explored as a moderator that will be used in the present research. By understanding social modeling in the context of healthy eating, and the moderating influence of a desire to affiliate, interventions can be created in order to increase the consumption of healthy foods.
2 CHAPTER 2: Literature review

2.1 Social Influence

Eating and decision making related to food often occurs in a social context, in which consumers are increasingly becoming influenced by the food choices others make and the amount of food consumed by others (Higgs, 2015). Social influence has been found when a consumer models the eating patterns of their dining partner (Higgs, 2015, Cruwys, Bevelander, & Hermans, 2015).

It was found that consumers consume more food, when in the presence of an eating companion that has consumed a large amount of food whereas in the presence of an eating companion who has consumed less, less food was eaten by the participant (Higgs, 2015, Cruwys et al., 2015). The main effect of social influence is that consumers will match the consumption patterns of their dining partners. The power of social influence has been studied by Goldman, Herman, & Polivy (1991), in which they wanted to test if the power of social influence is contingent on the hunger/satiety of the subject.

As developed by Herman, Roth & Polivy (2003), the normative interpretation model, reconciles previous findings that have found that consumers will increase or decrease food intake in the presence of others, due to mechanisms such as impression management, minimally eating and social facilitation. The normative interpretation model proposes that modelling occurs due to an individual’s attention to information about appropriate consumption, which is communicated through another’s behaviour. Herman et al., (2003) proposed that there are two norms to be considered in a social situation; avoid-excess norm and minimal-eating norm. These norms
provide consumers with the knowledge as to what is the appropriate amount to consume, such that they will not consume more than largest consumed amount and less than the smallest consumed amount.

Cruwys et al. (2012), proposed that social norms follow from the normative interpretation model, as social norms provide a normative belief as to what is appropriate to consume in a given situation. By extension, the mechanism that has been identified to explain the effects of social influence and social context on consumption is the operation of social norms in the social context (Higgs, 2015). Social norms are defined as “implicit codes of conduct that provide a guide to appropriate action” (Higgs, 2015, p. 38). Consumers use the actions and information of others’ eating behaviours to guide their own eating behaviour within a given situation (Higgs, 2015). As per the definition, consumers follow social norms to participate in the appropriate eating patterns of the given situation. Social norms tend to occur within a social group, in which a social group can be defined at the level of nationality, peer group, family or friendship group (Higgs, 2015). Memberships in social groups and the desire to affiliate with social groups that we are associated with will be discussed in a later section.

The human biological condition suggests that when individuals are in a state of hunger or satiety, they will engage in behaviours that will alleviate the discomfort associated with these states of being (Goldman, Herman, & Polivy, 1991). Goldman et al. (1991) hypothesized that the need to alleviate one’s hunger would moderate the modeling of those in the 12-hour and 24-hour food deprivation condition. Participants were recruited for a hunger and taste perception test, that took place over two 45-minute section on the same day. Participants were told that they would not be able to eat between sessions, to ensure that they would consume during the first session.
Participants were given one of three instructions on the food deprivation requirements for the experiments. In the low deprivation condition participants refrained from eating 4 hours prior to the experiment, and upon arrival were given a milkshake to neutralize their hunger. In the moderate condition participants refrained from eating 12 hours prior to the experiment and in the high deprivation conditions participants refrained from eating 24 hours prior to the experiment.

Participants were told that they would be completing the taste test in pairs to cut down on time, the second participant was a confederate and given instructions on how much to consume (Goldman et al., 1991). The experimenter placed three platters of food on table, with plates, napkins and glasses of water, all food was cut into bite-sized pieces and portioned to have approximately 25 calories each. The first platter was made up of 2 of three sandwiches; to account for dietary concerns, the second platter consisted of 2 apples and 2 pears, and the third platter consisted of 20 oatmeal and 20 sugar cookies. Participants were instructed to consume at least one piece of each food, and they had 15 minutes to complete the survey, if they finished prior to the 15 minutes, participants could go back and consume as much food as they would like. Confederates consumed one piece of each food within the first 5 minutes, completed the survey and went back to consume more food for the last ten minutes, depending on their condition. In the inhibition condition, the confederate did not consume any food during the 10 minutes, and in the augmentation condition, the confederate consumed 2 more pieces of each sandwich, 1 more piece of fruit each and 2 more cookies of each type. At the end of the 15-minute period, the platters were removed, and participants were given a closing questionnaire.

The main effect of social influence was found, as all participants were subject to modelling regardless of their prior food deprivation (Goldman et al., 1991). Goldman et al.
(1991) proposed that many individuals will be susceptible to social influence concerning consumption, even when physiological pressures of hunger were strong.

In study 2, Goldman et al. (1991) wanted to identify why the modelling was so effective for individuals who were deprived for 24 hours. The study was performed in a similar manner as study 1, except; there was no 12-hour manipulation, a control condition was added and only 2 kinds of sandwiches were provided. Goldman et al. found that those in the inhibition condition consumed 30 percent less than those in the augmentation condition, and those in the highly deprived condition who encountered a confederate who consumed minimally (6 pieces), only consumed 12 pieces. Goldman et al. believed this was significant, as all pieces were measured to be 25 calories, which does not compensate for the calories missed in 24 hours.

Social modeling was powerful in exerting control even with 24 hours deprivation thusly, hunger deprivation exerts a weak effect on modelling (Goldman et al. 1991). The results of Goldman et al. (1991) studies established that social influence is very powerful in controlling consumption, and participants still operated under the normative belief, in which other’s behaviours operate as a guide to appropriate behaviour in a given situation. The study performed by Goldman et al. provides evidence of the main effect of social influence and its power in controlling modelling.

The main effect for social norm following occurs robustly, as identified by the contextual, individual and social factors that modify the extent to which modelling occurs (Cruwys et al., 2015). Social norm modelling may be strong or weak based on contextual factors, such as food type, and a live or remote confederate, individual factors such as hunger and satiety,
sex, body weight, impulsivity and eating goals (Cruwys et al., 2015). Lastly, social norms can be followed due to social factors such as, type of social norm, a desire to affiliate, familiarity, similarity and shared group membership (Cruwys et al., 2015).

Social norms can be presented in three ways, and each has its own strengths and weaknesses in terms of influencing consumption. The three ways that will be discussed are live confederate, persuasive messages and environmental cues. A live confederate is a contextual factor that influences the extent to which modelling occurs. Persuasive messages are considered social factors and allows a social norm to be presented in different formats. The different formats evoke varying responses in behaviour. Lastly, environmental cues are considered contextual factors, as they are clues or information that have been left behind by a previous consumer. These environmental cues will modify the context, which will modify the decision-making process of the consumer. As discussed previously, social norm modelling can occur due to individual factors, and social factors, these will be discussed as moderators of social norm modelling.

2.1.1 Live Confederate

Though the choice of food and how much to eat appears to be an individual decision, it seems to be influenced by social factors that are beyond our individual characteristics. Social influences play a role in consumption, as the eating environment of today is highly social, in which we eat with our colleagues, family and friends. Their choices of food and how much they eat may have an influence on our own decision-making process. The first instance of social influence is a live confederate, in which a co-eater is present, and the food choice and intake of the co-eater have a direct influence on consumption.
Bevelander, Anschütz, & Engels (2012) considered the food intake of normal-weight and overweight children using a normal-weight confederate as a model, and to identify if peer intake modelling is maintained over time. Bevelander et al. hypothesized that normal-weight and overweight children would match the food intake of the confederate.

Bevelander et al. (2012) performed a 3 (confederate intake: no, low or high confederate intake) by 2 (participants weight status: overweight or normal weight) between subject’s experimental design. Participants were recruited from an elementary school and randomly assigned to one of the three experimental conditions, participants and confederates were picked up from their classroom by an experimenter. The experiment was broken up into two sessions with two different areas to perform the experiment. The second session took place at least 1 day after the first session was complete. In the first session the room was set up with a table and a chair on each side of the table, with two glasses of water, two bowls of chocolate covered peanuts and a puzzle. Confederates were instructed on how many chocolate covered peanuts to eat before the participant entered the room. In the high intake condition confederates were instructed to eat 10 chocolate covered peanuts, in the low intake condition confederates were instructed to eat 3 chocolate covered peanuts and confederates were instructed to eat nothing in the no intake condition. Confederates were equipped with a buzzer that would vibrate when they were to take a chocolate covered peanut. Participants were instructed prior to entering the room, that they could consume as much or as little as they would like, and they would be completing the puzzle with a partner for ten minutes. After the ten minutes, two experimenters entered the room and the participant was led to another room to complete a questionnaire.
In the second session the room was set up for one person with two bowls of snacks (savoury and sweet) that were overflowing with snacks (Bevelander et al., 2012). Prior to entering the room participants were instructed that they would be completing the same puzzle as before and they would be able to drink and eat as much or as little as they would like. After ten minutes the experimenter entered the room and administered the questionnaire.

Bevelander et al. (2012) conducted this study to identify if social influence has an effect on the modelling of food intake in children. The results of this study confirm the hypothesis that children’s food intake is influenced by the intake of a peer confederate. In the second session, participants consumed a similar amount to what they consumed in the first session, which confirms that there are some prolonged effects of social influence. The first session confirms the use of situational norms, such that a peer’s intake creates a norm that will guide appropriate behaviour, in the second session the situational norm may have turned into a personal norm that guided behaviour.

Social norms as a mechanism of the normative interpretation model postulates that consumers will model the eating patterns of those in the environment to ensure the consumption of correct foods and amounts. A study performed by Hermans, Herman, Larsen, & Engels (2010), considered the social modeling effects of young women and their breakfast intake. Past research has considered the modelling of eating snack foods, in these situations the appropriate consumption is ambiguous, making the consumption of the confederate more important as an indicator of what is an appropriate amount to consume. Hermans et al. performed one study with 3 conditions: no breakfast, small breakfast and large breakfast. Participants were randomly assigned to each condition where they were provided with a demographic questionnaire and
survey. A confederate was present in each condition and would consume either 1 slice (small) or 4 slices (large) of bread with filling, along with 1 cup of tea or coffee (small) or 2 cups of tea or coffee (large). It was found that participants did not model the eating patterns of the confederate, though they correctly reported the amount of food consumed by the confederate in each condition. Hermans et al. hypothesized that the absence of modeling was because of ambiguity, in that, breakfast foods are a stable and habitual eating behaviour where appropriate consumption is already established and does not have to be inferred from the environment. Evidence suggests that norm following most likely occurs in a less familiar context; such as consuming snacks or novel foods, in which the appropriate consumption needs to be inferred from the social context (Higgs, 2015). Social modeling thusly occurs in response to ambiguity in the environment, in which social norms are interpreted and used to guide appropriate behaviour.

Past research has considered the influence that type of food (unhealthy or healthy) has on social norm following. It has been found that people are likely to follow the social norms associated with unhealthy foods (i.e. consumers will follow a social norm that supports the consumption of unhealthy foods such as chips, soda etc.) (Cruwys et al., 2015). Pliner and Mann (2005) found that consumers are less likely to model the eating patterns of healthy or unpalatable food. Pliner and Mann hypothesized that participants will choose the unhealthy food, even in the presence of a social norm that favours the healthy “unpalatable” food. Participants were instructed to take a seat at a table, in which there were two plates each with a bite-sized cookie. On one plate there was a palatable cookie and was referred to as the “creamy” cookie, the other plate had the unpalatable cookie and was referred to as the “light” cookie. Participants were exposed to a poster about the nutritional information on each cookie and were told to eat both
cookies and rate their first impression of each cookie. Participants were then taken to a second table, where they were told they could choose which cookie they would like to do a detailed tasting for, they were also presented with information on the previous participants choices. The information presented corresponded to the condition they were a part of. Pliner and Mann were interested in participants’ choice, so participants were exposed to two bowls of each cookie, and whichever cookie they choose they would have to consume at least 4 cookies, which is equivalent to one full sized cookie. As hypothesized by Pliner and Mann, participants chose the palatable cookie, regardless of the norm condition they were a part of. Learning about others choosing the unpalatable cookie did not influence a participant’s decision to choose the unpalatable cookie.

Pliner and Mann (2005), concluded that consumers are less likely to model the food choice of a confederate than they are for food intake, in part due to preferences. When it comes to food choice, preference plays a role in the decision-making process, which evokes certainty in the decision. Consumers know what they like, and when making a food choice they will consider their preference for certain foods in the decision-making process. Thusly, consumers will be more likely to choose what they like which is a personal norm and will not consider the social norm. In terms of food regulation, portion size choice and consumption, there is uncertainty in the decision-making process which needs to be inferred from social norms. Consumers are unaware of the how much to consume, which portion size is appropriate to consume and when, due to this uncertainty a consumer does not have a readily available personal norm that will guide behaviour. Thusly, consumers will follow a social norm during the decision-making process of food intake.
Past research has found extensive evidence that individuals will model the intake of their eating partners, this evidence has been found with a live and remote confederate (Robinson & Higgs, 2012). Robinson and Higgs expanded on the work completed by Pliner and Mann (2005) and wanted to observe if participants would model the food choice (healthy and unhealthy food choice) of a confederate at a lunch buffet. Robinson and Higgs hypothesized that participants in the unhealthy condition would choose more unhealthy foods than if they were alone and that participants in the healthy condition choose more healthy food than if they were alone.

Participants were recruited under the guise of a mood and eating attitudes experiment and were randomly placed into one of three conditions (unhealthy, healthy and control condition) (Robinson & Higgs, 2012). Confederates in the unhealthy condition choose a lunch consisting of 3 sandwich quarters, 6 pieces of chips, 2 cheese and onion pastries and 4 cocktail sausages. Confederates in the healthy condition chose a lunch consisting of 3 sandwich quarters, 8 carrot sticks, 4 cherry tomatoes and 4 rice cakes. Participants in the healthy and unhealthy condition choose their meal after observing the meal that was chosen by the confederate, participants in the control condition selected food alone. Confederates were instructed to act similarly for all participants and they were instructed to choose their meals in view of the participant.

Confederates and participants were lead to the study room which was furnished to appear like a café, confederates and participants were instructed to sit at opposite ends of a small table and asked to complete a questionnaire on their personality and hunger rating (Robinson & Higgs, 2012). Once the questionnaire was complete the confederate and participants were told that they would have to select and consume a meal from the lunch buffet provided, there were no restrictions on what they choose and how much they choose to eat. The experimenter handed a
plate to the confederate, the confederate chooses their meal and waited to the side of the buffet in view of the participant, once the selection was complete the experimenter handed a plate to the participant, so they can choose their meal. In the control condition (alone condition) participants were given the plate and asked to make a meal choice, once the selection was complete participants; in all conditions, were taken into a separate room to eat their meal. After the meal was complete participants were given a closing questionnaire to corroborate the cover story and told that they could leave once the questionnaire was complete.

As Robinson and Higgs (2012) hypothesized participants in the unhealthy condition, choose a greater amount of unhealthy foods when with a confederate than participants choosing alone, as evidenced by the reduced number of carrot sticks. In the healthy condition there was an increased choice of carrot sticks in comparison to the unhealthy and control condition (alone condition). This suggests that participants were influenced by the food choice of confederates in the healthy condition, such that there was a norm that encouraged the consumption of some healthy food. This finding suggests that consumers use others behaviour to guide their own behaviour when considering food intake, and others behaviour can encourage the choice of healthy foods though they prefer some of their meal to be pleasing.

Past studies have found that social eating can promote and inhibit consumption depending on the social motives of the individual as well as the consumption of the co-eaters. The social motive and consumption of co-eaters will lead to differential eating among groups, which can be explained by the normative framework. Individuals are motivated to avoid eating in excess when eating with others, as eating in excess; healthy or unhealthy foods, is associated with a negative stereotype (Howland, Hunger, & Mann, 2012). To achieve this, individuals will
turn to their co-eater as a guide for how much can be eaten without appearing to eat excessively. Secondly, amongst groups of friends the primary influence on consumption are the social norms set out by the group, which can lead to the promotion or inhibition of consumption.

Howland et al. (2012) performed two studies in which they manipulated a restrictive eating norm in a group of friends, to determine if the norm caused the participant to eat less while eating amongst friends and alone. The primary hypothesis is that participants will be influenced by the food intake of the confederate, such that they will consume more when the confederate has a high food intake. The second hypothesis is that the social norm created in study 1 would carry over into study 2.

In the first study, a group of three friends were brought into the lab for a discussion task and were provided with healthy and unhealthy snacks. Snacks refers to the smaller portion sizes of foods that are consumed in between larger meals such as breakfast, lunch and dinner. There were two conditions; a restrictive eating norm and a control condition. The restrictive condition was manipulated by choosing two of the three friends at random and instructing them to eat only vegetables, the control condition was given no instructions on what to consume. Participants were taken to separate rooms to provide instruction for the experiment, receive consent, and in the restrictive condition, participants were instructed on what to consume. Groups were then reunited and seated around a table where a tray of healthy and unhealthy snacks were available, participants were then asked to discuss a campus issue for 5 minutes and told to help themselves to the snacks. The dependent variable was the number of pieces of each type of snack that the participant consumed, which was determined by colour coded toothpicks on each piece of food. The two friends were then separated and taken to different rooms, leaving the participant in the
same room with the tray of food, to complete the closing questionnaires. The restriction norm condition was significant when in a group setting, as was evidenced by the reduced number of vegetables and unhealthy snacks consumed by the participant. When participants were left alone there was no evidence of the norm influencing consumption as the norm created in the group setting did not carry over into eating alone setting.

Study 2 was performed in a similar manner to study 1 with 4 exceptions. In study 2, the snack that was to be consumed was freshly baked bite-sized cookies only, each participant was given a plate of 6 cookies, which was replenished after the 5-minute group session, prior to the completion of the closing questionnaires (Howland et al., 2012). Lastly, in the restrictive condition participants were told to not consume any of the cookies, and in the control condition participants were told to consume at least two of the cookies to ensure that a restrictive norm was not enforced inadvertently. As in study 1, two of the 3 participants were instructed on how much to consume; as described above. Once participants received their instructions and completed the consent forms in their separate rooms, the friends were reunited and completed the task as in study 1. Based on study 2, the restrictive norm was significant in reducing the number of cookies consumed, the norm was also found to carry-over while participants were alone, such that significantly fewer cookies were consumed in comparison to the control condition.

The work completed by Howland et al. (2012) demonstrated that social norms are powerful influences within friend groups, and that social norms can influence individuals to eat less. Study 2, demonstrated that a restrictive norm can be influential even when alone. Howland et al. proposed that its significance comes from the importance of friendship, as friends are considered trusted and credible sources of identity, and thusly social norms established in a
friend group can extend beyond the friendship context. Thusly, social norms can be used to influence individuals to consume healthy foods and healthy amounts of foods.

Stel and Koningsbruggen (2015) expanded on previous work that has identified that individuals match the consumption of their co-eaters, regardless of their co-eater’s weight status. In the present research, the authors used a live confederate, healthy food intake and the weight status of the co-eater to determine if a confederate’s weight status moderates the modeling effects found in previous studies. Stel and Koningsbruggen hypothesized that participants would match the food intake of the confederate.

Participants were randomly assigned to one of four conditions; 2 (food intake: 3 vs. 10 cucumber slices) by 2 (confederates weight status: normal weight or overweight) (Stel & Koningsbruggen, 2015). The dependent variable was the number of cucumber slices the participants consumed. Participants were recruited under the guise of a reaction test to images, participants and confederates were placed in a room and were made to watch a neutral film fragment. Once participants watched the neutral film, they were told that they would be watching a 15-minute film of great migrations of animals, two bowls with 15 slices of cucumber were placed in front of the confederate and the participant, and confederates were told to consume the number of slice corresponding to the condition. Once the film was complete, the confederate was taken to another room, and the participants was given a closing questionnaire, with demographic questions and a manipulation check. The results of study one confirms the hypothesis, that participants matched the intake of the confederate, these results were not moderated by the weight status of the confederate.
In study 2 Stel and Koningsbruggen (2015) replicated study 1, with an extra weight status experimental condition; underweight confederate, and they manipulated the food intake of the confederate to be 0 or 4 cucumber slices. The procedure for study 2 was similar to the procedure in study 1, with the exceptions described above. The dependent variable was the number of cucumber slices that was consumed by the participant. As hypothesized by Stel and Koningsbruggen, participants consumed more cucumbers when the confederate consumed four slices of cucumber than when the confederate consumed no slices of cucumber. There was no main effect of weight status of confederates, but there was an interaction effect of an underweight confederate, such that more modelling was identified when the confederate was identified as underweight.

The results of study 1 and study 2 suggest that regardless of weight status, individuals consider the intake of others to guide their own behaviour (Stel & Koningsbruggen, 2015). The main effect of modelling was stronger with an underweight confederate, which can be in part due to the stereotype associated with overweight individuals, that overweight individuals are poor indicators of appropriate health behaviour due to their weight status.

Hermans, Larsen, Herman, & Engels (2009), looked to expand on the findings of a previous study which studied the effects of social modelling on palatable food. In the present study Hermans et al. looked to consider the effects of social modelling of nutrient dense food in young adult women. Hermans et al. hypothesized that participants would consume more in the presence of a high intake confederate than a low intake confederate.
Hermans et al., (2009) used a between-subjects experimental design with three conditions; no-intake, low intake and high-intake. All participants were exposed to a confederate who ate the number of vegetables according to their experimental manipulation. Confederates in the no-intake norm ate no vegetables, the low intake norm ate 3 pieces of vegetable and the high intake norm ate 10 pieces of vegetables. The pieces of vegetables consumed were carrots and cucumbers that were cut into a similar size and weight bit-sized pieces. A no-intake condition was included in the experimental design to test if an eating companion increases or decreases food intake.

Participants were recruited under the guise of evaluating TV commercials (Hermans et al., 2009). Participants and confederates were taken into a room that was designed to look like a living room, with two couches, a coffee table, and a side table between both couches that had a pitcher of water, glasses and a tray of vegetables. The session took place over 60 minutes, with a 5-minute session in which the confederate and participant watched and evaluated 5 commercials. After evaluating the commercials, participants and confederates had a 15-minute break, they were instructed to stay in the room, but could help themselves to food and refreshments. Confederates were instructed on how many pieces of vegetables they were to consume and were instructed on the rate of consumption using a small light that would flash in the corner of the room, there was no restriction on the type of vegetable that they could consume. After the break, the confederates and participants were given 5 minutes to evaluate the same 5 commercials but were free to discuss it amongst themselves. Once this was complete, the confederate was taken to a different room and the participant was asked to complete a questionnaire about the experiment,
and demographics. The dependent variable was the number of vegetable pieces that the participants consumed.

The results of this study confirm the main effect of social modelling, that young women model the food intake of their dining partners, such that participants consumed a similar amount of vegetables to that of the confederate. Hermans et al., (2009), compared the results of this study, to their previous study on modelling of palatable food, and found stronger modelling effects with palatable food. The stronger modelling effects can be explained due to the impression management that takes place when consuming palatable food. Women are concerned about appearing feminine to their eating partner and will want to closely match the food intake of their dining partner to avoid a negative impression, in contrast consuming nutrient dense food is not associated with negative stereotype and women may be less concerned with what is the appropriate amount of food to consume. Based on this study, the main effect of modelling was identified using nutrient dense food, suggesting that social norm strategies can be used to increase the consumption of healthy and nutrient dense foods.

Social norms as a mechanism of the normative interpretation model postulates that consumers will model the eating patterns of those in the environment to ensure the consumption of correct foods and amounts. A study performed by Hermans, Herman, Larsen, & Engels (2010), considered the social modeling effects of young women and their breakfast intake. Past research has considered the modelling of eating snack foods, in these situations the appropriate consumption is ambiguous, making the consumption of the confederate more important as an indicator of what is an appropriate amount to consume. Hermans et al. performed one study with 3 conditions: no breakfast, small breakfast and large breakfast. Participants were randomly
assigned to each condition where they were provided with a demographic questionnaire and survey. A confederate was present in each condition and would consume either 1 slice (small) or 4 slices (large) of bread with filling, along with 1 cup of tea or coffee (small) or 2 cups of tea or coffee (large). It was found that participants did not model the eating patterns of the confederate, though they correctly reported the amount of food consumed by the confederate in each condition. Hermans et al. hypothesized that the absence of modeling was because of ambiguity, in that, breakfast foods are a stable and habitual eating behaviour where appropriate consumption is already established and does not have to be inferred from the environment. Evidence suggests that norm following most likely occurs in a less familiar context; such as consuming snacks or novel foods, in which the appropriate consumption needs to be inferred from the social context (Higgs, 2015). Social modeling thusly occurs in response to ambiguity in the environment, in which social norms are interpreted and used to guide appropriate behaviour.

When considering the study performed by Hermans et al. (2010), the main effect of social influence was not found. Due to the nature of breakfast, participants have a personal norm that functions to guide appropriate consumption. A social norm is pertinent in eating situations in which a personal norm is not developed, thusly the personal norm cannot guide behaviour and a person must rely on the information that is provided by the social norm. Moving forward, a condition for social norm modelling is ambiguity in the eating context.
2.1.2 Persuasive Message Denoting Social Norms

There are two types of social norms that function as influences on behaviour. There are descriptive and injunctive social norms that influence behaviour, as found by past research. Descriptive and injunctive norms follow from the normative framework, which postulates that social norms function as means to guide appropriate behaviour (Burger et al., 2010).

A descriptive social norm refers to what others have done in a similar situation, individuals follow descriptive social norms as they believe in the “collective wisdom of others” (Burger et al., 2010). A descriptive norm becomes a shortcut or heuristic, as individuals believe if others have behaved in this way then it should be the most efficient or productive way to behave (Burger et al., 2010). An example of a descriptive norm as found in a study performed by Mollen, Rimal, Ruiter, & Kok (2013, p. 85) is “everyday more than 150 hamburgers [name of the University] students have a hamburger for lunch here”.

Injunctive social norm refers to the societal standards of how one should behave in a given situation (Burger et al., 2010). Individuals are motivated to follow injunctive norms as they represent normative behaviours that are generally rewarded (Burger et al., 2010). Injunctive norms are highly motivating when an individual has high-cognitive resources, as they serve as a mode to affiliate with others, using appropriate behaviours (Mollen et al., 2013). An example of an injunctive norm as found in a study performed by Mollen et al. (2013, p. 85) is “Have a tossed salad for lunch!”

Simply, a descriptive norm is a norm that describes what others do, whereas an injunctive norm is a norm that describes what others think you should do (Cruwys et al., 2015). Based on
the meta-analysis completed by Cruwys et al. (2015) it has been found that descriptive norms have more of an influence on social norm following than injunctive norms, as they provide people with a salient example of what is the appropriate behaviour in a given situation.

Lally, Bartle, & Wardle (2011) considered how the misperception of a behavioural norm in a peer group leads individuals to behave in unhealthy ways. An individual’s social identity is linked to the social group they are a part of and conforming to the behavioural norms associated with the social group is important to establishing one’s social identity and self-esteem. Social norms are important influencers on behaviour as people will focus on the what important others have done to guide their own behaviour. Descriptive norms guide behaviour as they provide individuals with what they believe important others have done in the past. Recent studies have found that an adolescents intake of unhealthy snacks and drinks was associated with the intake of their peers.

Lally et al. (2011) hypothesized that participants would have a misperception of their peer’s intake of unhealthy and healthy foods, participants would overestimate their peer’s consumption of unhealthy foods and perceive their peers to be more accepting of these behaviours. It was also hypothesized that participants would be influenced by descriptive and injunctive norms of unhealthy and healthy foods that concerned the intake of their peers, lastly it was hypothesized that participants would underestimate their peer’s consumption of healthy foods and in turn this would influence their own consumption of healthy foods.

Participants were recruited from four high schools in grade 12, and were each given a questionnaire (Lally et al., 2011). The independent variable for this study are the questions on the
questionnaire that are posed as a descriptive or injunctive norm, and the dependent variable was the answer to these descriptive and injunctive norm questions. The questionnaires were gender, age and school specific and included questions on fruits and vegetable along with sugar-sweetened drinks and snacks. The snack foods were not labeled as unhealthy, but they are generally considered to be unhealthy snacks. The questionnaire included questions pertaining to the participants own intake of fruits and behaviours, descriptive norm questions, participants attitudes towards eating fruits and vegetables, injunctive norm questions and demographic questions. An example of the descriptive norm questions is “how many servings of fruit do you think boys in year 12 at your school generally eat”, and example of the injunctive norm questions is “in general do you think boys in year 12 at your school think that eating two or more snack foods on most days is sensible/foolish” (Lally et al., 2011, p. 624).

Lally et al. (2011) found that participants held a misperception about their peer’s intake such that they believe that their peers consume more unhealthy snacks and less fruits and vegetables. Lally et al. also found that participants perceived their peer’s attitudes towards eating unhealthy as more positive and their attitudes towards eating fruits and vegetables as negative. The descriptive norms were strongly associated with modelling of that behaviour than the actual behaviour (injunctive norm) of their peer’s. The work completed by Lally et al. confirms the use of persuasive messages to denote social influence on the consumption of unhealthy foods and drinks. Though the persuasive message was not explicitly present in the form of a banner or cue, the denotation of the social norm is still present and has impacted the consumption patterns.

The prevalence of unhealthy consumption behaviours has been of growing interest, these unhealthy behaviours lead to the overconsumption of unhealthy food and the under consumption
of healthy foods. These unhealthy consumption patterns are integrated into the social norms of a
group, and thusly diffused throughout the social group to influence all those who are associated
with the group in question. Due to integration of unhealthy behaviours, it is hard to sway away
from the social norm of overconsumption of unhealthy foods and unhealthy behaviour, towards a
healthy lifestyle (Mollen et al., 2013).

Mollen et al. (2013), considered the use of descriptive and injunctive norms to modify
food choice in individuals within a natural setting. Mollen et al. used healthy descriptive norms,
unhealthy descriptive norms and healthy injunctive norms to test the effects of normative
messages. Mollen et al. hypothesized that an unhealthy descriptive norm would result in more
unhealthy food choices being chosen. It was also hypothesized that both types of healthy norm
messages would result in more healthy choices in comparison to a control or unhealthy norm
condition.

The study was performed at the food court on campus from the hours of 11 to 2 pm,
using only university students (Mollen et al., 2013). The food court contained several different
food stalls with varying levels of healthfulness, Mollen et al. (2013) used a salad bar and grill
area for the purpose of this study. Three social norm messages were created, which referenced a
salad or a hamburger. All social norm messages started with “What are you having today?” and
proceeded with the specific social norm message (Mollen et al., 2013, p.85). The descriptive
unhealthy message referred to the hamburgers, the descriptive healthy message referred to the
salad bar, and lastly the injunctive norm referred to the salad bar which showed approval for the
healthy choice. The descriptive healthy message read “Every day more than 150 [name of
university] students have a tossed salad for lunch here” (Mollen et al., 2013, p.85). The
descriptive unhealthy message read “Every day more than 150 [name of university] students
have a burger for lunch here” (Mollen et al., 2013, p.85). The healthy injunctive norm message
read “Have a tossed salad here!” (Mollen et al., 2013, p.85). The injunctive norm used was a
positive injunctive norm that demonstrates to participant that others approve of this choice. Each
message was accompanied by the school logo and a picture of the respective food. The norm
message was presented in the form of 4 posters that were posted around the food court for four
consecutive weeks. The experimenter aimed to distribute 40 surveys over the course of three
hours. The dependent variable was the choice of a tossed salad or burger.

Mollen et al. (2013) conducted this study to increase the external validity of the effects of
descriptive and injunctive norms on healthy and unhealthy food choice. As was hypothesized,
the descriptive and injunctive norms did have an influence on food choice. The healthy
descriptive norm resulted in more choices of the tossed salad than the control condition, the
injunctive norm did not result in more choices of the tossed salad and lastly both healthy norm
messages resulted in a greater choice of tossed salad than the unhealthy descriptive norm.

Based on the work completed by Lally et al (2011) and Mollen et al. (2013) there is
evidence that persuasive messages can be used to influence the consumption of unhealthy foods.
Descriptive norms provide consumers with knowledge of what others have done in a similar
situation, this speaks to the power of advertising of unhealthy foods. Advertising speaks to what
others would do in a similar situation and creates a heuristic of appropriate behaviour, making
the call to action for unhealthy foods top of mind. This evidence suggests that descriptive norms
are powerful in influencing consumption, and they should be used to combat the
overconsumption of unhealthy foods. Both descriptive and injunctive norms are powerful
motivators to consume unhealthy or healthy foods, as they nudge consumers towards what others have done in the past, or what is a socially approved behaviour (Mollen et al., 2013).

Highlighting healthy descriptive norms can be used as a promotion strategy for healthy foods (Mollen et al., 2013). By using a descriptive norm to influence healthy behaviours, the social norm is making the common behaviour salient, thusly making it the most appropriate choice. Mollen et al. (2013) proposed that using a descriptive norm may not work if the prevalence of the behaviour is not common within the society in question. As proposed by Mollen et al. further research needs to be conducted to determine if there is a different influence on behaviour when the message pertains to a behaviour or to an individual or social group.

Robinson, Harris, Thomas, Aveyard, & Higgs (2013b), performed a study which considered the use of social norms and health-based messages to reduce young adult’s intake of high caloric snacks. Participants were randomly placed into a social norm message, health message or control message condition, and were categorized based on their consumption of high caloric snacks (low consumers/high consumers). The posters contained an image of junk food, with a message that defined junk food. The posters differed in the message that was presented in the middle, in the social norm-based (descriptive norm) message the poster read “students eat less junk food than you might realize...” in the health-based message the poster read “reducing junk food intake is good for your health…” (Robinson et al., 2013b, p.3). In the control condition the poster was of textbooks and only referenced the importance of studying. Participants evaluated a poster with a message corresponding to the condition they were a part of, once they viewed the poster, participants completed a mock mood measure before selecting and consuming a snack. Based on the study, Robinson et al. found that there was no difference in between a
health or social based message but, both messages were effective in reducing the amount of high caloric snacks that were consumed. The health based, and social norm-based messages were effective for both low and high consumers of high caloric snacks. As proposed by Robinson et al., a social norm-based message (descriptive norm) is a novel intervention that can be used to promote the consumption of fruits and vegetables and reduce the consumption of unhealthy foods, which was studied by Robinson, Fleming, & Higgs (2014).

Robinson, Fleming, & Higgs, (2014) performed a study on the use of health or social norm-based messages to encourage the consumption of fruits and vegetables. Robinson et al. (2014) predicted that participants who were exposed to a social norm-based message would choose meals and snacks that contained fruits and vegetables, more than participants who were exposed to a health-based message. Participants were recruited to complete both studies and completed a questionnaire in which they reported on their baseline hunger and fruit and vegetable intake, which would classify them as low or high consumers of fruits and vegetables.

In Study 1, participants were exposed to a poster and flyer with a health message or a social norm-based message, and then were asked to choose among a lunch menu, with a variety of different vegetable and non-vegetable items. The poster and flyer contained images of vegetables and two lines of text, that differed amongst conditions. The social norm-based message read “Most students eat more vegetables than you’d expect. A lot of people aren’t aware that the typical student eats over three servings of vegetables each day...” (Robinson et al., 2014, p.1058). The health-based message read “Eating a lot of vegetables is good for your health. A lot of people aren’t aware that heart health and cancer risk can be improved by eating three servings of vegetables each day...” (Robinson et al., 2014, p.1058). Robinson et al. found that low
consumers of vegetables who were exposed to a social norm-based message, choose and consumed more vegetable dishes than those exposed to the health-based message. There was no difference, in meal choice with vegetables, between the two messages in high consumers of vegetables.

In study 2, participants were exposed to a poster with images of fruits and vegetables and one of three messages; descriptive norm, injunctive norm or a health-based message (Robinson et al., 2014). The descriptive norm message read “A lot of people aren’t aware that the typical student eats their five servings of fruits and vegetables each day” and the injunctive norm message read “A lot of people aren’t aware that the typical student thinks their peers should eat five servings of fruits and vegetables each day. Students think you should eat more fruit and vegetables than you’d expect” (Robinson et al., 2014, p.1060). Lastly, the health message read “eating five servings of fruit and vegetables a day can improve your health. Eating a lot of fruit and vegetables is good for your health” (Robinson et al., 2014, p.1060). Participants were then asked to choose among a buffet with four plates; two fruit and vegetable options and two high calorie snack option.

It was found that participants who were classified as low consumers, when exposed to a descriptive norm, choose and consumed more fruit and vegetable dishes, and had a lower mean intake of high caloric snack foods than low consumers who were exposed to the health-based message (Robinson et al., 2014). Low consumers of fruits and vegetables who were exposed to the injunctive norm-based message consumed similar amounts to participants who were exposed to a health-based message. Robinson et al. found that using a social norm-based message was more effective than a health-based message due to the motivation to conform to the presented
norm. Using an injunctive norm message did not result in modelling, which may be explained with a participant’s knowledge that consuming fruits and vegetables is an approved behaviour. As participants already have knowledge of what others approve of participants were not inclined to modify their behaviour, the results of this study suggest that a descriptive social norm-based message can be used to promote the consumption of fruits and vegetables for low consumers of fruits and vegetables.

Salmon et al. (2015) used a social proof cue to increase healthy food choices of a “low-fat” cheese. A social proof heuristic is defined as the “tendency to adopt the option that was preferred by others” (Salmon et al., 2015, p.114). The social proof cue acts as a descriptive social norm, in which the social proof cue indicates to individuals what others have done in a similar circumstance. The social proof heuristic is highly influential when consumers are in a state of ego-depletion, and they do not have the resources to make a deliberate decision. In past research, it has been found that in a state of ego-depletion consumers will favour the tempting and hedonic food products. In states of ego-depletion consumers will make the automatic and impulsive choice, as they do not have the resources to way the pros and cons of a choice. Consumers will likely choose the pleasurable and impulsive choice of hedonic foods, as to make the healthy food choice is not automatic and requires deliberation. In contrast, Salmon et al., considered using ego-depletion to favour the healthy food choice, using a social proof cue in the form of a banner promoting a “low-fat” cheese. Participants were exposed to a banner promoting the “low-fat” cheese, which indicated to customers that this cheese was the most sold brand of cheese in the supermarket, the “low-fat” cheese banner describes to customers what others have done in a similar situation which is a social norm cue or descriptive norm.
The study took place over several weeks, and the results were gathered through the sales of the target cheese (Salmon et al., 2015). The sales within the experimental weeks were compared to a control period, in which participants were not exposed to the banner. States of low and high ego-depletion were induced throughout the experiment to determine if a state of ego-depletion can result in the purchase of a healthy food. All participants were told to speak about themselves into a voice recorder for three minutes, those in the condition with high ego-depletion were told to not use the words “I” or “uhm” during the three minutes.

Salmon et al. (2015) found that adding a social proof cue in the form of a banner, leads to an increase in the purchase of the low-fat cheese when participants were in a state of ego-depletion. Salmon et al., proposed that in a state of ego-depletion consumers would typically decide based on a known heuristic, which favours the unhealthy foods. Salmon et al., used the banner as a means of creating a social proof heuristic which prompted consumers to follow what other consumers have done in a similar circumstance, which was purchase the cheese.

Thomas et al. (2016) expanded on past research that considered using social norm-based messages in the form of banners and posters to promote the purchase and consumption of healthy foods. Thomas et al. considered the use of social norm-based message in the form of posters at local restaurants where students frequent. Thomas et al. conducted the experiment to determine if these social norm-based messages have an impact in a restaurant setting, and if the behaviours identified during the intervention phase persists over time. Thomas et al. hypothesized that using a descriptive social norm message indicating that most diners consume vegetables with their meal would increase their purchase of vegetables with their meals, and this would persist for a week after the posters were taken down.
The experiment took place in three restaurants and was a quasi-experimental design with three phases (Thomas et al., 2016). The three phases were: preintervention phase, intervention phase and postintervention phase and each phase lasted for two weeks. During the intervention phase there were posters containing the social norm-based message plastered around the restaurant, throughout the experiment the norm healthy eating posters were present.

During the preintervention phase, data was collected from sales to accurately base the social norm-based message, data was collected for two weeks. During the intervention phase, posters were placed around the restaurant, placed at the point of selection and on the tables (Thomas et al., 2016). Posters were printed in colour with a wood-grain design and the social norm-based message superimposed on top of the image. The social norm-based message read “Most people here choose to eat vegetables with their lunch” (Thomas et al., 2016, p.1028). All the restaurants served meals with and without vegetables and had the option to purchase sides of vegetables. During the intervention phase, data was collected on what was purchased for two weeks. During the postintervention phase the social norm posters were removed and data was collected on what was purchased over two weeks.

As Thomas et al. (2016) hypothesized when the social norm-based messages were posted there was an increase in the meals that were purchased with vegetables in comparison to the preintervention phase. The influence of the posters persisted over time, as there continued to be an elevated rate of purchase for meals with vegetables in comparison to the preintervention phase. The following of a social norm lead the consumers to behave in an appropriate manner, as well as creating a positive experience which enhances affiliation with a social group. The poster
acted as a means of communicate normative information, which lead consumers to modify their behaviour to act according to social norm that is set by the social group.

Studies performed by Robinson et al., (2013, 2014), Salmon et al., (2015) and Thomas et al. (2016) have found that social norms can be used to promote healthy eating and weight loss; using descriptive social norms, though further research needs to be considered to identify consistent results (Higgs & Thomas, 2016). Descriptive social norms provide individuals with a guide to appropriate behaviour based on what others have done in a similar instance through written information. Social norms and the use of environmental cues will be discussed in the following section; as environmental cues allow social norms to be perpetuated without an eating partner present.

2.1.3 Environmental Cue

Beyond having a live confederate influencing consumption, a remote confederate and the social norms established by the remote confederate influence consumption. Social norm modeling can occur with a remote confederate with the use of environmental cues; such as empty wrappers or displays that indicate what others have consumed (Higgs, 2015, Higgs & Thomas, 2016, Cruwys et al., 2015). As was found by the meta-analysis of Cruwys et al. (2015), a remote confederate has been found to influence social norm following. A remote confederate sets up social norms through environmental cues, which are considered; consciously or otherwise, in the decision-making process (Cruwys et al. 2015).

Environmental cues are considered the physical cues in the direct environment that conveys information about how others were behaving previously (Prinsen, Ridder, & Vet, 2013).
Environmental cues provide a social norm with respect to food, and helps people make assumptions about what others were eating. An example of an environmental cue, is a table with empty plates with cocktail sticks on them, this observation demonstrates that others at the event enjoyed the appetizer, and thusly an individual should also partake in consuming the appetizer. Environmental cues may influence behaviour because they provide a social proof heuristic, in which people will consider what other people have done in a similar situation to guide their behaviour. A social proof heuristic is defined as the tendency to observe what others do as guidance for behaviour when situations are unfamiliar or ambiguous.

Prinsen et al. (2013) investigated whether the main effect of social influence would be effective if it was presented as an environmental cue. The authors hypothesized that more chocolates would be chosen when an environmental cue was present that indicated that others before them chose chocolates. Prinsen et al. conducted study 1, to determine the main effect of social influence using an environmental cue. Prinsen et al. considered this research question in the context of a lunchroom at a local bakery. A bowl of chocolates was placed on the counter at the entrance, a second bowl was placed by the bowls of chocolates, with or without empty wrappers. It was found that the number of chocolates eaten was higher in cases in which the environmental cue demonstrated that previous customers had eaten the chocolates.

Prinsen et al. (2013), performed a second study in which participants were brought into the lab under the guise of completing a reaction test, prior to completing the reaction test, participants were told they would relax for 10 minutes to ensure equal relaxation among participants. During the ten-minute relaxation period, participants were told they could sit at a table, where a bowl of chocolates and magazines were available. Prinsen et al. manipulated the
conditions by having a second bowl that was full or empty of chocolate wrappers. The authors found similar results to those found in study 1. Participants were more likely to consume chocolates when they were exposed to an environmental cue that indicates that others have also consumed chocolates.

The study performed by Prinsen et al. (2013), demonstrates the main effect of social influence using an environmental cue, when a person is not present. The environmental cue acts a social norm, of what others have done in the past in a similar situation. Thusly, the environmental cue conveys information on what is an appropriate action, and one should behave in the current situation.

Social factors are a powerful influence on the consumption patterns of individuals, these social factors not only influence the consumption pattern of an individual, but it can spread through social networks (Robinson, Benwell, & Higgs, 2013a). These social factors create social norms associated with the “appropriate” consumption; as related to the social group. These social norms are perpetuated throughout the social group, leading to weight gain and eating patterns that are similar across members of the same social group (Robinson et al., 2013a).

Robinson et al. (2013a) considered the influence of social norms using the remote confederate paradigm, in which a confederate is not present, but participants are exposed to a fictional account of what other participants have done in the past. The amount of food consumed by the remote confederate acts as a food intake norm, which should influence the intake of the participant (Robinson et al., 2013a).
With a live confederate there are two types of social influence, informational social influence which provides people with what is the appropriate behaviour, there are also self-presentation concerns, in which people want to ingratiate themselves with the model and create a good impression (Robinson et al., 2013a). Due to the nature of a live confederate trait empathy has been found to have an influence on modelling with a live confederate. Robinson et al. (2013a) considered the moderating influence of empathy to determine the underlying process that functions as a social influence in the remote confederate paradigm. Individuals who are empathetic have “…a natural tendency to imagine how others interpret their behaviour, and so eat a similar amount to their eating partner to present themselves favorably” (Robinson et al., 2013a, p. 211).

Robinson et al. (2013a) recruited participants under the guise of a taste test for cookies. Robinson et al. hypothesized that exposure to a low intake norm would result in a decrease of food intake when compared to a no norm condition, and exposure to a high intake norm would result in an increase in food intake when compared to a no norm condition. Robinson et al. wanted to test if trait empathy would moderate modelling within a remote confederate paradigm as it has in live confederate studies.

Participants were randomly assigned to 1 of three conditions; control (no norm), high intake norm and low intake norm (Robinson et al., 2013a). When participants entered the lab, they were given a consent form and appetite measures to complete. Participants in the low intake norm and high intake norm were exposed to an information sheet that displayed the number of cookies 4 fictitious participants consumed (low intake: 1, 1, 2 and 2, high intake: 8, 9, 9 and 10) and told they would have to fill out the demographic information but not the number of cookies.
that they had consumed. The experimenter returned once the forms were completed, removed the forms and provided the participants with their cookies and taste rating measures. Participants were instructed that they could eat as many cookies as they would like and that they had 15 minutes to complete the study, along with a personality measure. The number of cookies that remained were counted to determine how many cookies each participant consumed.

As hypothesized, participants who were in the high-intake norm consumed more cookies than those in the no norm condition, participants in the low-intake norm consumed less cookies than those in the no norm condition (Robinson et al., 2013a). Trait empathy was found to not have a moderating influence on modelling of food intake, this suggests that in a remote confederate study, participants were not concerned with self-presentation and thusly did not feel a need to present themselves favourably (Robinson et al., 2013a).

This study suggests that environmental cues can be used to represent the social norm of the current situation, and will bolster the effectiveness of the environmental cue, as others have followed this social norm to act accordingly. Using an environmental cue to represent a social norm to influence the choice of healthy foods will be studied by Burger et al. (2010).

In the past, research on social influence has found little evidence for social modelling in the context of food choice (i.e. the choice between a healthy or unhealthy option). Burger et al. (2010), considered social influence in the context of food choice of healthy or unhealthy foods to find evidence of social influence on food choice. Burger et al., used descriptive and injunctive norms represented as an environmental cue to identify social modelling on food choice.
Burger et al. (2010), defined injunctive norms as the societal standards of how one should behave in a given situation. Consumers are knowledgeable about the injunctive norms associated with healthy foods, as consumers understand that they should eat healthy foods and limit the amount of unhealthy foods they consume. The authors wanted to consider the use of descriptive norms that would suggest to individuals what others have done in a similar situation in the past, thusly if others have consumed a healthy meal they would choose to consume a healthy meal. Burger et al. hypothesized that participants would select the healthy snack if they are led to believe that others before them have chosen the healthy snack.

Participants were recruited under the guise of a taste test, and participants were greeted by an experimenter, who led them to a table. Participants were randomly assigned to one of three conditions; healthy, unhealthy and control condition (Burger et al., 2010). In the healthy condition, on the table was an empty Nutrigrain bar, in the unhealthy condition, there was an empty Snickers wrapper and the table was clear in the control condition. The experimenter told participants that she was finishing up from a previous experiment, and the experimenter for the current experiment is running late, but she will be setting it up for her in the meantime. During this time, the experimenter would notice the empty wrapper on the table and ask participants if they could throw the wrapper out. As participants were throwing out the wrapper, there attention would be brought to the wrappers already in the garbage can. In the healthy condition, there were 3 empty wrappers of the Nutrigrain bar, in the unhealthy condition there were 3 empty wrappers of Snickers bars.

The experimenter placed two glasses of water, and one of each type of snack; Snickers bars, Milky way Bar, and two different flavours of Nutrigrain bars, in random order (Burger et
Once the room was set up, the first experimenter left the room and told the participant that the second experimenter would be in shortly. Shortly after, the experimenter came in and explained that the study is to test the effects of temperature on taste perception to participants, the experimenter instructed the participants to choose one of the four bars that they would like to complete the taste test on. The experimenter would turn around while the participant was making the decision and left the room to gather up the materials, when the experimenter came back the bars that were not chosen were removed. Participants were then given the test materials and asked to complete the questionnaire while they ate the snack bar they choose.

As hypothesized, participants who were exposed to the healthy environmental cue were more likely to choose the healthy snack bar to consume during the taste test (Burger et al., 2010). This finding suggests that participants followed the descriptive norm when making their snack decision. Due to the nature of the study, the experimenter turned away while participants made their decision and they ate alone, thusly the choice to consume the healthy snack was due to the descriptive norm and not as a concern of what others might think.

Study 2 was performed in a similar manner as study 1, with 4 changes. In the second study there was only 1 experimenter, participants were told to choose their snacks from a basket containing bite-sized snacks (Burger et al., 2010). The experimenter explained to participants, that the study was going to be completed in three parts and that they would have to choose and consume 3 of the bite-sized snacks. Lastly, the experimenter made it clear to participants that they would choose and consume snacks without anyone in the room, as the experimenter would be in the other room. The number of empty wrappers and the remaining snacks were counted to determine how many healthy and unhealthy snacks were consumed during the study. As
hypothesized, participants relied on the perceived descriptive norm when making a choice between the healthy and unhealthy snacks. Such that those who were exposed to a healthy descriptive norm (empty wrappers for the healthy snack), consumed more healthy snacks than those in the unhealthy descriptive norm and control conditions.

Both studies conducted by Burger et al. (2010) support their hypothesis that consumers will rely on the salient norm when deciding on what to do in a given situation. In both studies, participants attention was drawn to the salient descriptive norm, and would change their behaviour accordingly. Participants made the choice without concern over what others think; as the experimenter turned around during the first study, and was not present in the second study, thusly the choice for the healthy or unhealthy snack was due to the descriptive norm. Burger et al. proposed that consumers will rely on descriptive norms, as they provide consumers with an aggregated judgement of what others have done in a similar situation in the past.

An environmental cue is a form of social influence that can be used to promote the choice and consumption of healthy foods, while dissuading the choice and consumption of unhealthy foods. The promotion of consuming healthy foods and the dissuasion of consuming unhealthy foods is a preliminary step in creating positive change in the consumption patterns of individuals. A growing body of literature is arising that supports the use of nudging in creating a positive change in the consumption patterns of individuals. A nudge is a type of cue; which is presented to consumers, that does not restrict a consumer’s choice, but aims to adjust their behaviour (Vandenbroele, Slabbinck, Kerckhove, & Vermeir, 2018). The environmental cue can be used as a nudge to influence the behaviour of consumers.
The relative novelty of environmental cue within the food realm, specifically in terms of food choice, leads to a lack of literature that supports the claim that an environmental cue can be used to create change within the food domain. Due to this lack of literature, further research needs to consider the extent to which an environmental cue can be used to promote the consumption of healthy foods and drinks.

### 2.2 Moderators of Social Influence

The main effect of social influence has been established with unhealthy and healthy foods, and across three different platforms; a live confederate, persuasive messages and environmental cues. The live and remote confederates are considered contextual factors and persuasive messages are considered social factors that play a role in the main effect of social influence.

Individual factors such as gender also influence the following of a social norm, in which females are more likely to follow social norms than males (Higgs, 2015). It has been hypothesized that females are more interested in facilitating social bonds with others, thusly leading them to follow social norms more than men (Higgs, 2015). Other individual factors, such as hunger and satiety, body weight and eating goals, have not been found to have a moderating effect on social influence and consumption (Cruwys et al., 2015). These individual factors, do not moderate social influence, in that regardless of an individual’s state of hunger, body weight or eating goal, they will be susceptible to social influences (Cruwys et al., 2015). Social influence is not limited to any age group, but social influence is moderated by individual characteristics such as self-esteem, which changes as we age (Cruwys et al., 2015). Self-esteem has been found to increase as we age such that, older individuals become more confident in
themselves (personal norms) which will modify the extent to which they follow social norms. Thusly, those who score higher in self-esteem will be less influenced by social influence, as they will largely follow their personal norms.

Cruwys et al. (2015) conducted a meta-analysis on the social modelling of eating. The meta-analysis focused on when and why social influence affects food intake and choice. The meta-analysis considered 69 studies on social modelling, and across the 69 studies 3 key conclusions were found (Cruwys et al., 2015). Firstly, there is near universal support, for the main effect, that consumers are influenced by other’s food intake and choices, demonstrating the influence that social norms have on consumption decisions (Cruwys et al., 2015). Across these studies, it has been found that significant moderators such as contextual, individual and social factors, as discussed earlier, can only account for small variations in social norm modelling (Cruwys et al., 2015). Cruwys et al. concluded that social norm modelling occurs not only because individuals seek information about what is appropriate eating behaviour, but also because individuals seek to affiliate with others.

2.2.1 Desire to Affiliate

As Cruwys et al. (2015) established through their meta-analysis, social modelling occurs not only because of what is appropriate behaviour in a given circumstance, but also to affiliate with others. This is further corroborated by Higgs (2015). Higgs explored the different reasons why social norms are followed and found that following a social norm enhances affiliation with a social group, ensures the consumption of correct foods, facilitated co-operation and sharing, and allows for self-perceptions to modify (Higgs, 2015). A norm referent group will influence the
strength of social norm modeling, in which consumers that are more strongly affiliated with the norm group, the more likely they are to follow the norm set by that group (Higgs, 2015).

Howland et al. (2012) investigated the influence that peer groups have on the promotion and inhibition of consumption. Howland et al. based their study on the normative interpretation of social influence, which postulates that among friends the primary influence on eating may be the social norms set by the group. This social norm explanation is consistent with research on social identity and health behaviours as proposed by Oyserman and Fryberg (2007). The authors demonstrated that perceptions of group norms and behaviours can guide health decisions. By extension, the influence of social norms can also be influential when an individual wants to affiliate with a group, to create a shared group membership, as they believe this group to be important to their identity.

Health and engaging in health behaviours becomes a part of one’s identity, as identified by one’s perception of what it means to be healthy and engage in behaviour to augment health. Due to identity being intrinsically linked to social groups that one identifies with, there is importance in understanding how social norms associated with in-groups, influences perception of health and health behaviours.

Oyserman and Fryberg (2007) used identity-based motivation model, which postulates that identity is infused with behaviours associated with an in-group. When behaviours are infused with identity, participating in those behaviours would foster a sense of inclusion in the in-group. Oyserman and Fryberg hypothesized that individuals want to participate in the lifestyle that is congruent with their in-group, thusly they will eat and behave in a manner that matches
their in-group. These behaviours can be positively or negatively associated with health, which will in turn influence an individual’s health.

Oyserman and Fryberg (2007) performed 7 studies to determine how identity is infused with health, and the ways in which to use identity-based motivation to improve health. In the first 4 studies, Oyserman and Fryberg test how making an individuals ethnic minority and social class salient will make in-group behaviours accessible and will in turn undermine health behaviour and access to health knowledge, which is associated with the outgroup. In studies 5-7, Oyserman and Fryberg further tested their model to determine the distinction between social identity and the larger society that creates health fatalism.

For the purposes of the current research, there will be a focus on study 2 and studies 5-7. The main effect of norm referent group identification and its function in determining health behaviours are determined in study 2 whereas studies 5 through 7 experimentally manipulate the main effect of norm referent group identification and its function in determining health behaviours.

In study 2, ethnic minorities and European Americans were recruited to evaluate their own ethnicity, and how much health behaviours are associated with the in-group (ethnic group) (Oyserman, & Fryberg, 2007). Oyserman and Fryberg (2007) hypothesized that ethnic minorities would be more likely to evaluate health behaviours as being characteristic as an out-group behaviour. Students were given a questionnaire and asked to complete which social group they identified with, and later asked to complete the in-group health behaviour questionnaire. As hypothesized, ethnic minorities were less likely to rate health behaviours as being characteristic
of in-group behaviours. Oyserman and Fryberg, proposed that ethnic minorities have less identity-based motivation to participate in health behaviours, which is especially prevalent when in-group and out-group membership is made salient.

In study 5, Oyserman and Fryberg (2007) hypothesized that participants who were primed to believe that healthy behaviour is out-group defining and unhealthy behaviour is in-group defining (many similarities condition), would believe that eating healthy is less helpful than those who were in the few similarities condition. African Americans were asked to generate 3 (few similarities condition) or 8 similarities (many similarities condition) to white, middle class society, participants were then asked whether healthy eating is helpful and to what extent are healthy and unhealthy behaviours apart of in-group behaviour.

Participants were randomly assigned to the few, many or control condition. In the similarities conditions participants were asked to “describe three (eight) ways African Americans and Whites are similar” (Oyserman & Fryberg, 2007). Participants were then asked about the efficacy of eating healthy, and they completed a demographic questionnaire and in-group social identity questions. The results of study 5, support the hypotheses proposed by Oyserman and Fryberg (2007), as participants who were led to believe that unhealthy behaviour is in-group defining (many similarities), believed that healthy eating was not as helpful in comparison to those who believed that healthy behaviours was in group defining (few similarities). Secondly, ethnic minorities more likely to believe that unhealthy behaviour is in-group defining behaviour more so than healthy behaviour, in contrast to the white, middle class society
In study 6, Oyserman and Fryberg (2007) wanted to replicate the findings from study 5 and add to the generalizability of their results by using a different ethnic minority group; American Indians. Study 6 was performed in the same manner as study 5 with two exceptions; the minority group was American Indians, and participants were asked on average how many years does engaging in health behaviours add to life expectancy. Oyserman and Fryberg hypothesized similar results to those in study 5, and that participants on average would believe that unhealthy behaviours are in-group defining. The results of study 6, are similar to the results in study 5, such that those who were in the many similarities condition believed that unhealthy behaviours were in-group defining and they believed that engaging in healthy behaviours would add fewer years of like in comparison to the few similarities condition. With study 5 and 6, Oyserman and Fryberg identified that minority social identity is likely characterized by unhealthy behaviours, and when in-group and out-group membership is made salient there is an increase in the endorsement of unhealthy behaviours.

Oyserman and Fryberg (2007) completed study 7, to replicate the results in a nonstudent, older sample. Completing study 7 provides generalizability to their findings in study 5 and 6, while considering if healthy behaviour was in-group or out-group defining. Study 7 was completed in the same manner as study 5, using the same dependent variable as study 6. Oyserman and Fryberg hypothesized similar results to those found in study 5 and 6. Participants differed in their beliefs of health and unhealthy behaviour being in-group or out-group defining, due to these differences there was a moderating influence of this belief on their response to how beneficial engaging in health behaviours is to overall health. There was no main effect or interaction effect in the control and few similarities condition, such that they believed that
engaging in healthy behaviours would be beneficial to overall health. When comparing responses from the many similarities condition to the control and few similarities condition there was a significant difference, such that their in-group/out-group belief would be a moderator. Participants who believe that unhealthy behaviour was not in-group defining, in the many similarities condition, believed that engaging in health behaviour was beneficial to overall health. Participants who believe that engaging in unhealthy behaviour was in-group defining, in the many similarities condition, believed that engaging in health behaviour was not beneficial to overall health.

In general, the results of these 7 studies bring to light that identity-based motivation does have an influence on how much an individual engages in healthy behaviour and believes that engaging in these health behaviours are beneficial (Oyserman & Fryberg, 2007). These results were moderated by the extent to which differences between the in-group and out-group were made salient, such that those who believed that the in-group engages in healthy behaviour were more likely to engage in healthy behaviours and believe that healthy behaviours are beneficial.

The desire to affiliate with others will be explored by the present research as a moderator of social influence, such that the desire to affiliate will increase or decrease the main effect of social influence. The desire to affiliate as a moderator of social influence will be explored within the three contexts used for the main effect of social influence; live confederate, persuasive messages and environmental cues.
2.2.1.1 Live Confederate

A normative interpretation model is used to explain modelling effects, such that individuals will attend to information about appropriate consumption which is communicated through other’s behaviours (Cruwys et al., 2012). Cruwys et al. (2012) extended the normative interpretation model to consider that individuals model others consumption because they seek to affiliate with others. To account for this, Cruwys et al. considered the use of Social Identity theory to explain why social influence emerges.

Social identity theory postulates that those perceived to be a fellow in group member, are considered relevant to developing an understanding of reality and the self. Cruwys et al. (2012) wanted to test the prediction that a norm for food intake would only be influential when participants perceived a shared group membership with those who were communicating the norm. Cruwys et al. hypothesized that perceived group membership will enhance modeling because individuals regard in-group norms as more valuable to the self than out-group norms.

Cruwys et al. (2012) created a 2 (in-group/out-group) by 2 (no eating/high eating norm) between-subjects design, plus control. Participants were assigned to one of 5 conditions, in the control conditions participants were not primed with an eating norm. In-group and out-group membership were manipulated using two different schools of technology (ANU or CIT) and their students, all students were recruited from ANU, and the dependent variable was the amount of popcorn eaten by participants.

The experiment was introduced as research comparing a promotional video created by ANU (in-group) or CIT (out-group) students (Cruwys et al., 2012). Participants were led to a
cubicle where they would be watching the promotional videos and given a tub of popcorn. The confederate told participants which school they attended, along with how much popcorn they have eaten, the participant’s attention was also directed towards the experimenter’s jumper (ANU or CIT), and the confederate’s popcorn tub. In the no eating condition, the confederate told the participant “I didn’t eat any of that popcorn”, in the high-eating norm condition the confederate told the participant “I ate all that popcorn” (Cruwys et al., 2012, p.755). Once the task was complete, the popcorn tub was taken and weighed.

The results of the study support the main effect of social influence, as participants consumed more popcorn when they were led to believe that the confederate ate all her popcorn than participants who were exposed to a confederate who ate no popcorn (Cruwys et al., 2012). There was a significant interaction effect between the group membership and the confederates intake. Thusly, Cruwys et al. (2012) found support for the hypothesis, such that modeling of eating occurred only when participants encountered an in-group member, and no modeling was found when participants encountered an out-group member. These results provide support for Social Identity theory, as perceived group membership is necessary for modelling to occur. These findings suggest that a desire to affiliate with the in-group, to ingratiate the groups identity as one’s own, is a driver of modelling the intake norms of the in-group members.

Past research has identified that participants will model the intake of others around them, even when they have been nutrient deprived for 24 hours and are exposed to a low intake confederate (Robinson, Tobias, Shaw, Freeman & Higgs, 2011). These results suggest that participants not only match others for uncertainty reduction but also to gain social approval. Mimicry has been used to facilitate social interaction and gain social approval, as mimicry
enhances perceived similarity to the group. With this understanding, participants will match the food intake of a confederate to ingratiate themselves with the person and gain social approval.

If social modelling is influenced by the need for social approval than it should be expected that there will be individual differences in the degree that individuals feel the need to affiliate with the confederate, which will change the degree that individuals will model the confederate (Robinson et al., 2011). Two traits that are related with the desire to affiliate are empathy and self-esteem. Empathetic individuals use modelling to increase liking and rapport, it is expected that those with high trait empathy will use social modelling more than those with low empathy. Self-esteem is in-part determined by a need to belong, it is then expected that those with low self-esteem may be more likely to model a confederate eating behaviour to facilitate social acceptance.

Robinson et al. (2011) designed two studies to investigate whether an ingratiation strategy explains the extent to which individuals will match the snack intake of their eating companions. For Study 1, participants were recruited under the guise of a social interaction task, were snacks were provided. Participants were told that they would be playing a fun game with a confederate (i.e. hang-man) and participants were given a self-esteem scale, empathy scale and a mood rating questionnaire. Participants and confederates were taken into a room, where a bowl of M&Ms was placed in front of the participant and the confederate, and asked to play the hang-man, after ten minutes the bowls were taken from the room along with the game. At the end of the experiment participants were given the mood rating questionnaire a second time.
The results of study 1 supported the hypothesis stated by Robinson et al. (2011) such that, trait self-esteem and empathy were associated with stronger modelling. Participants classified as having lower self-esteem, and participants classified as having higher trait empathy consumed similar amounts of M&M’s to the confederate.

In study 2, Robinson et al. (2011) manipulated social acceptance with a crossword that contained words associated with social acceptance. Robinson et al. hypothesized that making social acceptance salient would temporarily reduce the desire to affiliate thusly resulting in lower modeling. Robinson et al. proposed that inducing temporary feelings of social acceptance would fulfill the need for social acceptance and thusly reduce the desire to ingratiate themselves with others. Participants were placed in one of two experimental conditions; social acceptance or a neutral condition. Study 2 follows the same method as study 1, but the confederate was told to eat 16 pieces of popcorn during the game session for both conditions.

The results of study 2 support the hypothesis proposed by Robinson et al. (2011) such that, participants in the social acceptance condition showed a smaller modelling effect than participants in the neutral condition. Participants in the social acceptance condition consumed less pieces of popcorn than those in the neutral condition (Robinson et al., 2011). Robinson et al. proposed that these results suggest that a desire to affiliate may be an underlying process behind social modelling.

The study performed by Robinson et al. (2011) provides evidence to support that a desire to affiliate and ingratiate oneself into a group may be a key driver for social influence. The desire
to affiliate will be further studied in the realm of persuasive messages and environmental cues to determine its extent of influence on social modelling.

2.2.1.2 Persuasive Messages

The desire to affiliate as a moderator of social influence can be presented as a persuasive message. To manipulate the desire to affiliate as a persuasive message, the desire to affiliate is presented as a descriptive norm. The descriptive norm represents what others have done in a similar situation which can elude to the behaviour of a group member. The group member can then be perceived as a in or out-group member.

Descriptive norms are an important influencer of behaviour and have been used to influence health behaviours. However, the use of descriptive norms has been found to influence behaviour in an undesirable direction, such as; informing college students of heavy alcohol consumption on campus has led to increased consumption (Stok, Ridder, Vet & Wit, 2012). Ironic effects are produced with these majority norms, as they are referencing what the majority population is doing, which is a negative behaviour. Minority norms; are norms that indicate what a small portion of the population are doing, which are opposing to a social norm. An example of a minority norm is; “Only 15% of University students consume their appropriate daily amount of fruits and vegetables”. Little research has considered how the use of minority norms can be used to influence healthy behaviours. Though minority norms are encountered daily, such as the observation of few people engaging in health behaviours, media coverage of the minority norms and lastly, the creation of campaigns that bring to light the low frequency of engagement in these health behaviours.
Due to the ironic effects produced by majority norms, Stok et al. (2012) considered if minority norms could potentially have the same ironic effects. Minority norms can also exert an influence on behaviour when they are made salient at the point of action. The influence of the norms depends on the extent to which one identifies with the norm referent group. An individual’s identity is made up of different environmental and group norms such that, every social situation has a set of appropriate behaviours and engaging in these appropriate behaviours signal to others one’s group membership, and the desire to affiliate with the referent group. Due to the importance of the norm referent group, Stok et al. wanted to investigate minority norms, taking into consideration how the norm referent group may moderate the results. Stok et al. wanted to understand how minority norms influence intake of fruits and vegetable, while considering a norm referent group as a moderator.

Stok et al. (2012) hypothesized that participants who receive the minority norm will exhibit lower intentions to consume fruit and a lower intake of fruit, but only when identification with the norm referent group was strong. In study 1, participants were recruited from a Dutch University, and they were given a demographic questionnaire with two questions pertaining to how much they identified with Dutch University students. Participants read a short text that stated the importance of consuming fruits, they were than exposed to a majority norm or minority norm of fruit intake in Dutch student’s fruit intake intentions was then measured. Both norms began with general information about fruit and vegetable intake and read “Previous research has shown that Dutch university students” (Stok et al., 2012, p.960). The majority norm than read “…do show quite good fruit intake behaviour: 73% of Dutch university students eat
sufficient fruit”, the minority norm read “...also do not show very good fruit intake behaviour: 27% of Dutch university students eat sufficient fruit” (Stok et al., 2012, p.960).

Stok et al. (2012) found that providing participants with a minority norm led to lower intentions to eat sufficient fruits in the coming period as compared to a majority norm. This effect was only present with participants who strongly identified with the norm referent group.

In Study 2, participants reported actual fruit intake over the course of the week, measures of identification with a group were experimentally manipulated (high vs. low identification) and lastly, a control condition was included (Stok et al., 2012). The authors hypothesized that participants in the majority norm, high identification condition would show an increase in fruit consumption in comparison to participants in the control condition. It was expected that participants in the minority norm, high identification condition would show a decrease in fruit consumption than participants in the control condition.

Majority and minority norm was manipulated similar to study 1, the norm referent group was manipulated by using Dutch university students or the Dutch population. The high norm referent group was the Dutch university students and the low norm referent group was the Dutch population. University students who wanted to consume more fruit were recruited, they completed a preliminary questionnaire, a 7-day food diary and an exit questionnaire. The experimental manipulation occurred during the preliminary interview along with the daily diary entries. The authors created a 2 (Type of Norm: majority/minority norm) by 2 (norm referent group: Dutch students/Dutch population) between subject’s design, and participants were exposed to a short text that reflected the condition they were placed in-. Stok et al. (2012) found
that participants in the minority norm, high identification condition ate significantly less fruit over the course of the week, than participants in the other 4 conditions.

The results of this study indicate that both majority and minority norms can influence intended and actual fruit intake (Stok et al., 2012). These results indicate that ironic effects can occur for both types of norms; these findings have important implications as stating that only a small population perform a health behaviour can negatively influence the likelihood that general population engage in that health behaviour. Since the health behaviour is only performed by a minority population, social proof as a mechanism cannot explain the modelling. Modelling of minority norms cannot be explained by social proof, as the information acts as an indirect negative social proof. Since only a few people partake in the health behaviour and the majority of people partake in the unhealthy behaviour, the minority norm acts as indirect negative social proof leading individuals to follow the unhealthy majority norm. Due to the influence of the norm referent group, a desire to affiliate with a group that one shares membership with is the moderator. Understanding the importance of the norm referent group has implications on the use of social norms to influence health behaviour.

Individuals will diverge from others due to several different reasons such as, diverging from a low-status other, diverging from a different other and diverging from a similar other (Berger & Heath, 2008). Berger and Heath (2008) considered the use of identity signaling theory to understand why divergence occurs. Identity signaling theory; as proposed by Berger and Heath, individuals diverge from others not only to create certainty in their own identity, and to understand their part in the social environment but they also diverge to signal the correct identity
to others. Such that they will diverge from a group to avoid sending the incorrect or undesired signal.

Berger and Heath (2008, p. 595) propose that “cultural tastes acts as signals or markers within the social communication system, communicating aspects of people to others.” Individuals will infer other’s social group status based on the attitudes, behaviours and products that are being used by the other (Berger & Heath, 2008). Such that conforming to a group’s attitudes, behaviours and products would signal to others group membership and identity, and diverging from these attitudes, behaviours and products could be costly to identity. On the other hand, diverging from the social norm can be beneficial if a dissimilar other has taken to following the social norm associated with the group. The dissimilar other will be associated with the social group, and thusly participating in those social norms will signal the incorrect identity, which can be costly as individuals do not want to be misidentified as a member of the out-group.

Berger and Heath (2008) hypothesized that individuals will be more likely to abandon identity relevant social norms that have been adopted by members of the out-group. Berger & Heath created 7 studies to study these hypotheses, for the purposes of this paper there will be a focus on the first 3 studies. Study 1 looked to establish the costs of being misidentified as an out-group member, study 2 looked to test if indeed individuals would abandon a social norm if it has been taken up by an out-group remember. Lastly, study 3 looked to consider if individuals would abandon the social norm if it has been made public, such as with junk food consumption.

Berger and Heath (2008), used study 1 to identify the costs of being misidentified as a member of the out-group. Berger and Heath hypothesized that outgroup simialirity would predict
the cost or benefit of being associated with the social group in question, such that individuals
would find it costlier to be misidentified as a member of the dissimilar out-group. Berger and
Heath gave participants a list of social groups and asked them how much being misidentified as a
part of the group would be help or hurt their ability to interact with others. Participants were
given a list of 15 social groups and a questionnaire that asked them to rate how similar they
perceive themselves to be to that social group, and how beneficial or costly is it to be
misidentified with the social group. Berger and Heath found that it was costlier to be
misidentified as a member of the outgroup, the results of study 1 support the hypothesis that
outgroup similarity influences the cost of being misidentified as a member of the outgroup, that
being.

Berger and Heath (2008) used study 2 to identify if individuals will abandon a groups
social norm, if they are being adopted by an outgroup. Berger and Heath used a real product;
Livestrong wristband, to test this notion. Berger and Heath sold the wristbands to a target dorm
and control dorm and told them that with the purchase of these wristbands they would be
supporting cancer awareness. After a week, these wristbands were sold to the academic dorm,
members of this dorm were generally considered the “geeks”. Members of the target dorm did
not dislike members of the out-group, but they did not want to be associated with them. Members
of the target dorms and the control dorms were given a survey 6 days after they were sold to
these dorms to identify wristband wearing and 14 days after the they were sold to all dorms to
identify wristband wearing. A questionnaire was given to all participants that asked about their
attitudes towards groups, general behaviour items and liking of the outgroup members, questions
on wristband wearing were embedded into the questionnaire.
Berger and Heath (2008) found that members in the target dorm stopped wearing the Livestrong wristbands once they had been adopted by members of the academic dorm. These results support the hypothesis that individuals will abandon social norms when they have been adopted by members of the outgroup (Berger & Heath, 2008).

Berger and Heath (2008) used study 3 to determine if public behaviour would lead to similar levels of divergence. Berger and Heath propose that identity signal theory would predict that divergence from the outgroup would occur in public, as when making a choice between healthy or unhealthy foods, though it may not happen in private.

Participants were recruited under the guise of a writing style experiment, and randomly placed into a condition; 3 (experimental condition: control condition vs. in-group condition vs. out-group condition) by 2 (product choice: public vs. private) (Berger & Heath 2008). Participants were given three journal articles to evaluate, the middle article for the in-group and out-group were related to junk food, in the control condition the middle article was not related to junk food. In the in-group and out-group condition the middle article was related to certain groups and their junk food consumption. The middle article read “a recent survey of campus eating habits found that undergraduate [graduate] students are by far the largest consumers of junk food…the survey found that the average undergraduate [graduate] student consumes almost two times the amount of junk food as an average consumer on campus” (Berger & Heath, 2008, p.599). Graduate students were selected as the dissimilar outgroup, due to pilot data that found that undergraduate students perceived them as an outgroup, but they do not dislike them. Once the article task was completed, students were taken to another study room that was set up to look like a dining hall with several different products pairs; each product pair had a healthy and
unhealthy option. Participants were given a grocery basket and told to select the items that they prefer, they were also told that they would get to take one of the items they choose home, the dependent variable was the choice junk food, participants then made their choices in public or private (i.e. with or without the experimenter present).

Based on study 3, participants were less likely to choose junk food, when junk food was associated with an out-group, these effects were stronger when they made their choices in public (Berger & Heath, 2008). When the decision was being made in private outgroup association was not a concern and thusly did not influence their decision. These results support the hypothesis that individuals will abandon social norms if they are adopted by an outgroup.

There are several questions that need to be answered to improve the overall health of the population, why do consumers partake in risky health behaviours, when they know the risks associated with those behaviours and what strategies can be used to reduce these risky behaviours (Berger & Rand, 2008). Identity is not only made up of personal interests, but identity is strongly influenced by the groups that individuals are a part of. These groups are associated with socially accepted behaviours that are dispersed throughout the group through social norms. Partaking in these behaviours and social norms will thusly signal to others group membership and an individual’s identity. Berger and Rand (2008) wanted to shed light to these questions by considering how health behaviours communicate identity.

An example of health behaviours communicating identity, is as follows, as explained by Berger and Rand (2008). Students at Stanford University hesitate to wear helmets due to the identity that is associated with those that wear helmets. Undergraduate students understand that
many bicycle accidents that happen on campus can be reduced if they only wore a helmet when riding on campus. When undergraduate students were asked why they do not wear helmets, they bring to light that graduate students wear helmets. Though undergraduate students did not dislike graduate students, they described graduate students as being socially awkward and intense. These differences create an in-group, out-group complex, in which graduate students do not want to be associated with this social group, and thusly avoid wearing helmets.

Berger and Rand (2008) examined whether risky behaviour can be mitigated by being linked to identities that consumers do not want to be associated with or perceived as. Berger & Rand hypothesize that associating risky health behaviour (i.e. the consumption of junk food and alcohol) with an out-group will improve public health. Berger and Rand used campaigns that link risky health behaviours with an avoidance group to enhance the health of the population. Berger and Rand performed 4 studies to investigate the strength and temporal persistence of identity-signaling manipulations and whether identity-avoidance manipulations can shift identity associations.

Study 1 used a field study to examine if an identify avoidance manipulation could be used to reduce actual junk food consumption (i.e. Coke or Pepsi, apple or brownie) (Berger & Rand, 2008). Undergraduate students were recruited and placed in one of two conditions (Group type: in-group/out-group), they then read three articles that associated junk food consumption with the corresponding social group. In the in-group condition, the junk food consumption was associated with undergraduate students, in the out-group condition, the junk food consumption was associated with graduate students. Once participants read these articles, they were taken to a second room that mimicked a normal shopping environment and choices that would have to be
made (i.e. apple or brownie). Participants were asked to choose their preferred item from the pairs and told that others would form an impression of them based on their choices, the number of junk food items each participant chose was summed up.

Berger and Rand (2008) found support for their hypothesis, that identity-based behaviour change strategies can be used to improve consumer health. Undergraduates selected healthier foods, when junk food consumption was associated with the out-group (Berger & Rand, 2008). This supports Berger and Rand’s assumption that the undergraduates want to avoid being associated with the out-group and participate in behaviours that signal to others that they are a part of the in-group.

Berger and Rand (2008) used study 2 to examine whether the out-group manipulation will be strong enough to shift the identity associated with alcohol and improve behaviour. Participants were recruited from two freshmen dorm rooms, over the course of two weeks’ flyers were placed in the dorms with one of two messages. The first message associated heavy drinking with graduate students, and the second message was informational and depicted the risks of heavy drinking. After two weeks, residents were asked to complete a survey on how much alcohol they have consumed over the week (Berger & Rand, 2008).

Berger and Rand (2008) found that participants consumed less alcohol when the flyer depicted the behaviour as being associated with the out-group, in comparison to the informational flyer. Berger and Rand found that interventions can shift the identity associated with a behaviour, this study also proposes that such campaigns can be used to improve the health
of the population. Lastly, these results emphasize identity-signaling mechanisms, as participants wanted to avoid others perceiving that they were a part of social group linked to heavy drinking.

Berger and Rand (2008) in Study 3 wanted to examine whether identity-based campaigns in a naturalistic setting can have similar effects as those found in the lab. Participants were stopped as they entered the campus cafeteria and asked if they wanted to complete a survey on personality and news. Once the survey was complete, participants were given a newspaper article task, similar to study 1. The newspaper articles depicted junk food consumption with a generally dissociative out-group; online gamers. After completing the task, participants could continue into the cafeteria to purchase and consume their food, unbeknownst to them a research assistant recorded what they ate.

Berger and Rand (2008) hypothesized that participants would order healthier food when junk food was linked to an out-group and these effects should be moderated by self-monitoring. High self-monitors will control their actions to achieve a desired public image, such that linking junk food consumption with an out-group should have a greater effect on the food choices of high self-monitors.

Similar to study 2, participants were approached on the way into the school cafeteria and asked to complete a self-monitoring survey and newspaper task (Berger & Rand, 2008). Participants were either given articles that associated junk food consumption with an out-group (online gamers), or they were in the control condition in which the articles had no association with food. Upon completion of the survey and task, participants were sent into the cafeteria to purchase and consume their food, participants choices were recorded.
In study 3, Berger and Rand (2008) found support for their hypothesis, when junk food consumption was associated with the out-group the patrons choose healthier options. Secondly, participants in the identity-signaling manipulation; who were high-self monitors, chose and consumed healthier foods, than low self-monitors. The moderation of self-monitoring is consistent with the identity signaling theory, as those who have a greater concern for identity signaling partake in behaviours that signal the appropriate identity (Berger & Rand, 2008).

The theory of planned behaviour postulates that an individual’s behaviour can be predicted by their intentions to engage in the behaviour, and by their perception of success if they are to engage in the behaviour (Louis, Davies, Smith, & Terry, 2007). It has been found that planned behaviour can predict a consumer’s food intake, such as consuming healthy foods. Past research has found that social norms set by norm referent groups are strong indicators of behaviour, and they are better predictors of behaviours than the theory of planned behaviour. The strong influence of social norms is due to the identity signaling that occurs when participating in social norms that are associated with a social group. Past research has found that descriptive social norms predicted behaviour (i.e. social modelling), especially when that behaviour was associated with norm referent social group.

Louis et al. (2007) tested how a norm referent group, and the strength of identification with the norm referent group predict behaviour, above and beyond the theory of planned behaviour as it relates to attitudes, subjective norms and perceived control of participating in that behaviour. Louis et al. (2007) hypothesized that the social norms and the norm referent group would interact to predict intentions to act, and that social norms and the norm referent group would be a better predictor of behaviour than the theory of planned behaviour.
Participants were recruited to complete in part one and part two of the study. At the beginning of part one, participants were given a questionnaire that asked them about determinants of the theory of planned behaviour (i.e. a participant’s intentions of consuming healthy foods, and how important others feel they should behave – other university students), and about the norm referent group (i.e. how similar they feel to other university students) (Louis et al., 2007). The questionnaire also asked them to self-identify as a university student, once the questionnaire was completed participants were given the opportunity to choose up to 5 candies from a bag of candies, the number of candies the participants choose was recorded on the back of the participants questionnaire. Part two of the study participants were given two self-report measures of eating behaviour, concerning their eating behaviour over the next two weeks, once the measures were complete participants were again given the chance to consume up to 5 pieces of candy from a bag of candies. The consumption of the candies during part one was considered past behaviour, and the consumption of the candies during part two was considered the observed behaviour. The intentions to consume healthy or unhealthy food was correlated with observed behaviour of consuming the candies.

As hypothesized by Louis et al. (2007), the student group norms and identification with the norm referent group predicted eating behaviour, such that participants who strongly identified with university students and perceived eating unhealthy as normative behaviour for university students were more likely to have intentions to eat unhealthily.
2.2.1.3 Environmental Cues

Though the desire to affiliate with a social group has been studied using a live confederate as well as persuasive messages, there is little evidence of the desire to affiliate being tested in the context of an environmental cue. A persuasive message can be considered an environmental cue as a confederate is not present when the manipulation is occurring. The results of a persuasive message study can be extended towards an environmental cue study.

The desire to affiliate with a social group has rarely been studied using a remote confederate paradigm, as theoretically there would be no desire to affiliate with a group if there is no one present to “judge” the character and identity of the person. Though no one is present and acting against the social norm would not be detrimental to one’s identity, acting according to the social norm can function as a normative framework. By acting according to the social norm set out by the in-group, an individual can be certain that they are acting appropriately within an unknown situation. Thusly, the importance of studying the desire to affiliate within the remote confederate paradigm lies in the lack of research that is available that merges identity signaling theory with the normative framework.

2.3 Directions for Current Research

Social norms have played a role in creating the under consumption of healthy foods. The under consumption of healthy foods gets integrated into the social identity of a group and its members and is diffused through the social network. The diffusion of the social group identity and the accompanying behaviours are a function of social norms. Due to the strong influence that social norms have on the decision-making process, social norms need to be considered as a means of intervention. Social norms have been found to influence consumers to follow the
choice of those around them, the strength of social norms can be harnessed to create a behaviour that favours healthy foods.

The normative framework postulates that individuals will follow the social norm that is present to act accordingly. Individuals tend to follow the social norm of the majority group as they are led to believe that that behaviour is the most correct behaviour, creating a social proof heuristic. Consumers will follow these social norms, consciously or otherwise, but the social norms create a social proof heuristic which functions as a shortcut for behaviour in an unknown situation.

This study will consider a healthy/unhealthy perspective in relation to familiarity. In that what is familiar to a consumer will be the unhealthy choice, and what is unfamiliar to a consumer will be considered healthy choice, as participants would not have encountered the product prior to the study. The environmental cue will provide participants with a social proof heuristic, as they will be exposed to what others have done in the past in a similar situation. By considering healthy/unhealthy in relation to familiarity, there is a manipulation of what occurs in the real world. Consumers are constantly exposed to unhealthy food cue; such as food wrappers and ads, and they are familiar with the products, creating an ease to which they would choose these unhealthy foods. On the other hand, consumers are rarely exposed to healthy food cues unless they seek out healthy foods, due to this, the ease at which they will choose a healthy option is limited. The present research will add to the literature that is concerned with how to improve the consumption of healthy foods.
The current research will manipulate social influence to nudge consumers to make a healthier choice. The environmental cue will be used to modify behaviour using social influence, such that participating in the normative behaviour is considered the most correct choice. The correct behaviour will consciously or otherwise be inferred by the environmental cue that denotes that others before them have chosen this product. The environmental cue, denoting in-group member choice will act as a second cue of taste for the healthy products. Perception of taste will be accounted for since the empty wrappers will signal to consumers that others have enjoyed this product. In doing this, the healthy equals untasty intuition will be combated. It has been found that when consumers see in-group members enjoying food, there may be an increase in their own enjoyment of that food, as they take others enjoyment as validation for their own choice (Bublitz et al., 2010). The environmental cue, denoting out-group member choice will act as a cue of avoidance of the healthy products, as found by Oyserman and Fryberg (2007). The current research will consider how the environment may trigger increased enjoyment through validation. In that using an environmental cue; such as empty wrappers, can signal to consumers that others have enjoyed this product, and thusly they should also participate in the consumption of this product.

Burger et al. (2010) used environmental cues to nudge consumers to choose a healthier option, when confronted with both a healthy and unhealthy option. As proposed by Vandenbroele et al. (2018), consumers believe that they can easily adjust their consumption at the point of purchase or decision and not at the point of consumption. The environmental cue will act as a social norm nudge, in which the environmental cue will provide information to the
current participant about what past participants deemed an appropriate food choice. Thusly, adjusting their choice in accordance with the manipulations prior to consumption.

Past research has considered the impact that social norms have on decision making, the results are positive, in terms of using social norms to nudge consumers to make a healthier choice. The purchase environment for foods, is highly social, such that other’s choices will influence our own choices.

Participating in behaviours that are congruent with our social group is important to establish our social position and being understood as a member of the in-group is beneficial (i.e. we reap the benefits of being a part of the group). These behaviours also establish our own social identity as well as signaling to others which group/social identity we are associated with. These benefits lead to a desire to affiliate with the in-group and subsequently a desire to avoid the out-group.

Studying the impact of social influence and the desire to affiliate is important for marketing researchers and marketing professionals who work at understanding and creating interventions that look to increase healthy behaviours in a social group. To create these interventions, researchers and marketing professionals need to understand the social identity that is associated with their target group (i.e. do they view their social group as generally healthy or unhealthy). Generally, campaigns are used to depict healthy foods being liked by a central social group (i.e. campaigns depicting the enjoyment of a health bar by all active women) so if the target consumers (i.e. all women) do not identify with that social group, these target consumers will avoid the product. Thusly, these individuals will not follow the desired behaviour as they do
not associate that behaviour with their identity, in order to keep their identity and behaviour congruent they will possibly choose to participate in the opposite behavior (Oyserman & Fryberg, 2007). With this knowledge, marketers need to create targeted campaigns to change health behaviours. Campaigns need to speak to the social identity of the social group or they need to increase the social groups association with the general population such that those desired behaviours become accessible and integrated into the social group’s identity. Firstly a campaign can choose a social group that the target consumers already identify with, or they can depict an unpopular social group consuming a rival product such that the target consumers infer that choosing your product is a promising way of avoiding being associated with the unpopular social group.

For the purpose of this study, the desire to affiliate will be manipulated using in-group and out-group membership to a set of social groups. An environmental cue; denoting the focal product, will be associated with either an in-group or out-group member not present but believed to have made the choice recently, and the subsequent choice of the participant will be recorded. This type of study will give insight into the interaction of social norms and the desire to affiliate, through in-group and out-group membership.

Participants will want to keep their social identity; as formed by their social group, and behaviour congruent and will act according to the social norm that was set out by their social group. When participants are led to believe that previous participants from their in-group chose the healthy product, they will want to act accordingly and will choose the healthy product. When participants are led to believe that previous participants from an out-group chose the healthy product, they will want avoid the behavior and thusly choose the unhealthy product.
The environmental cue is important to study because of the limited research in that area. Studying environmental cues and the desire to affiliate; denoted by in-group/out-group membership, will still function within a private setting. If the situation is unknown and no personal norm has been established, an individual will look to follow a social norm; as denoted by an environmental cue, but they will want to follow the social norm that is most closely related to their in-group, as they will still want to act accordingly. Participating in this “correct” behaviour in private (i.e. with no judgement) will then become a personal norm that will be functional in a public setting.

This research is an important contribution to the literature, as it will consider the use of the desire to affiliate as a moderator for social influence, using an environmental cue to represent the social norm.

3 CHAPTER 3: Research Questions and Hypothesis

3.1 Main Effect Hypothesis

Figure 1: Conceptual Map of Main Effect Hypothesis

The present research will look to answer the research question of, how do social norms and a desire to affiliate interact in the choice of healthy or unhealthy food. The main effect for
this research, is that the social norm will act as a social proof heuristic such that the choice of a healthy or unhealthy food will be influenced by the environmental cue present.

*Hypothesis 1:* Participants exposed to an environmental cue denoting the choice of healthy food by previous consumers will be more likely to choose the healthy option than participants exposed to the environmental cue denoting the choice of unhealthy foods.

### 3.2 Interaction Effect Hypothesis

![Conceptual Map of Interaction Effect Hypothesis](image)

*Figure 2: Conceptual Map of Interaction Effect Hypothesis*

The current research will also consider the interaction effect of social norms and the desire to affiliate. Such that the desire to affiliate will moderate the influence that social norms has on the choice of healthy and unhealthy food.
Hypothesis 2A: Participants who are exposed to an environmental cue showing the choice of the healthy version by previous consumer is more likely to choose the healthy version over the standard version if the environmental cue is associated with an in-group member versus an out-group member.

Hypothesis 2B: Participants who are exposed to an environmental cue showing the choice of the standard version by previous consumer is more likely to choose the healthy version over the standard version if the environmental cue is associated with an out-group member versus an in-group member, which is an avoidance motive.

4 CHAPTER 4: Research Methodology

4.1 Study 1: Pre-test

The purpose of this study was to decide which product pair (food or beverage) would be used in the main study. This was done by identifying preferences for varying food and beverage products and what leads to these preferences, along with a participant’s willingness to sample these products. The healthy product chosen for the main study, should be considered healthier than the standard version, and thusly considered less tasty than the standard version, which is reflected in a low average of participants willing to sample the product. As stated earlier a product from Study 1: Pre-test was chosen and was used in Study 2: Main Study.
4.1.1 Participants

63 participants were recruited from SONA – Marketing and Consumer Studies. Students received 2% course credit for participating in this study.

4.1.2 Methods

This is a within-subject design, in which participants were asked to respond to several survey questions relating to 5 food product pairs, each food product requires a choice between a healthy version and a standard version (unhealthy). The 5 product pairs that were used in the study are: mixed berry pomegranate juice versus a standard mixed berry juice, avocado brownies versus a standard brownie, mixed berry juice (sweetened with agave syrup) versus a standard mixed berry juice, kale chips versus a standard potato chips and mixed berry acai juice versus a standard mixed berry juice. The product pairs were presented to each participant in the order listed above and were not random. Questions included multiple choice and open ended (fill in the blank) questions, in which participants had the opportunity to give their own response about certain food products.

Participants were shown an information blurb of each product pair prior to answering questions, the information blurb for kale chips can be seen in Figure 3. The questions presented to participants related to perceived healthfulness, perceived taste and willingness to sample for each product pair. Accompanied with each question is a picture of the product pairs, as seen in Figure 4. The information blurbs and pictures for all product pairs (mixed berry pomegranate juice, avocado brownie, mixed berry juice sweetened with agave syrup and mixed berry acai juice) can be found in Appendix A – D respectively.
vitKrazy is a Prince Edward Island Company that had recently launched a new product in Ontario. The first product they launched is a potato chip, similar to a Ruffles potato chip. Due to the rising concern associated with frequent consumption of potato chips, vitKrazy wants to create a veggie chip. vitKrazy is considering making a veggie chip using Kale, a dark leafy green. Dark leafy greens are high in antioxidants and help prevent cancer. But on the other hand, the higher the antioxidants and chlorophyll, the bitter the kale chips will be. The kale chip will be flavoured with salt to slightly reduce its bitter flavour.

Figure 3: Information Blurb for Dark Leafy Greens

Figure 4: Pictures of Kale Chips (left) vs. Potato Chips (right)

4.1.3 Measures

The following are the questions for the kale chips, each product presented to participants had the same format. Each product has a healthy and standard version, along with a pre-determined standard measurement for both products (i.e. Kale chips was measured at 35 grams). Each standard product had an anchored calorie estimation (i.e. Potato chips has 170 calories per serving). Table 1 illustrates the pre-determined standard measurements and anchored calorie estimation for each product.
4.1.3.1 Perceived Healthfulness

Perceived healthfulness question for the kale chips are as follows: “How much healthier do you believe these kale chips are, in comparison to these potato chips?” This question was measured on a 7-point scale ranging from extremely less healthy (1) to extremely healthier (7), with a midpoint of no difference (4). A calorie estimation question was used, as a check for perceived healthfulness. “The standard potato chips (35 grams) contains 130 calories, how many calories do you think are in these kale chips (35 grams)?” This question was an open-ended question with an anchored calorie estimation for the standard product.

4.1.3.2 Perceived Taste

Perceived taste was measured with the question, "How much more savoury do you believe these kale chips (35 grams) tastes in comparison to these potato chips?" Perceived taste was measured on a 7-point scale ranging from extremely less sweet (1) to extremely sweeter (7), with a midpoint of no difference (4).

4.1.3.3 Willingness to Sample

Willingness to sample was measured with the question, "How likely would you be to sample these kale chips (35 grams) in comparison to these potato chips?" A 7-point scale was used for this question, ranging from extremely unlikely (1) to extremely likely (7), with a midpoint of neither likely nor unlikely (4).

Number of healthy versions chosen was asked with the question, "If you had the choice to bring 7 bags (in total) of the chips presented to you in this survey home, how many of each type (kale chips and the standard potato chips) would you choose?". Participants were asked to write
down how many bottles of the healthy version and of the standard version they would take home. A full list of questions and answer options can be found in Appendix E - Pre-Study Measures.

<table>
<thead>
<tr>
<th>Healthy Version</th>
<th>Standard Version</th>
<th>Standard Measurement</th>
<th>Calorie Anchor (calories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Berry Pomegranate Juice</td>
<td>Mixed Berry Fruit Juice</td>
<td>250mL</td>
<td>130</td>
</tr>
<tr>
<td>Avocado Brownie</td>
<td>Brownie</td>
<td>35 grams</td>
<td>145</td>
</tr>
<tr>
<td>Mixed berry Juice (sweetened with agave syrup)</td>
<td>Mixed Berry Fruit Juice</td>
<td>250mL</td>
<td>130</td>
</tr>
<tr>
<td>Kale Chips</td>
<td>Potato Chips</td>
<td>35 grams</td>
<td>170</td>
</tr>
<tr>
<td>Mixed Berry Acai Juice</td>
<td>Mixed Berry Fruit Juice</td>
<td>250mL</td>
<td>130</td>
</tr>
</tbody>
</table>

Table 1: Product Type, Standard Measurement and Calorie Anchor

4.1.4 Results

After accounting for non-consenting participants, missing data and incomplete surveys, a sample size of 43 (n = 43, 44.1% female) participants was analyzed. Descriptive Statistics were performed on the 5 product pairs that participants were shown. The means were taken into consideration when analyzing the results of the descriptive statistics, one-sample t-tests and a paired sample t-test were also completed. The descriptive statistics table for all products can be found in Appendix F – Pre-Study Results, Table F1. The one-sample t-tests can be found in Appendix F – Pre-Study Results Table F2, and the paired sample t-tests can be found in Appendix F – Pre-Study Results Table F3.

The purpose of the pre-study was to determine the product pair that would be used in the main study. The healthy product in the product pair, should be considered healthier than the
standard product, and thusly considered less tasty than the standard version. There should also be some hesitancy in the willingness to sample the healthier version.

Based on the analysis, of the three types of healthy mixed berry juices (pomegranate, acai and naturally sweetened) had similar results. Participants were willing to try them (slightly likely) which was evidenced by the number of glasses that they would be willing to take home. On average participants were slightly likely to sample the juices. For the mixed berry pomegranate juice the means and one-sample t-tests are as follows: $M_{\text{Pomegranate}} = 5.60$, $SD = 1.53$, $t(42) = 6.87$, $p = .00$. For the mixed berry acai juice, the means and one-sample t-tests are as follows: $M_{\text{Acai}} = 5.58$, $SD = 1.31$, $t(42) = 4.54$, $p = .00$. For the mixed berry juice with natural sweetener the means and one-sample t-tests are as follows: $M_{\text{NaturallySweetened}} = 5.14$, $SD = 1.63$, $t(42) = 7.89$, $p = .00$. These means are out of 7 and are compared to the midpoint (4) of neither likely nor unlikely. Thusly, the means for each healthy juice is significantly different than the midpoint (4) of neither likely nor unlikely.

The number of glasses for the pomegranate, acai and naturally sweetened pairs follow, the means for the healthy version are compared to the means for the standard version. The average number of glasses chosen; out of 7, for the healthy version of each product was as follows: $M_{\text{Pomegranate}} = 4.49$, $M_{\text{Acai}} = 4.40$ and $M_{\text{NaturallySweetened}} = 3.86$. The average number of glasses; out of 7, for the standard version of each product is as follows: $M_{\text{Pomegranate}} = 2.56$, $M_{\text{Acai}} = 2.60$ and $M_{\text{NaturallySweetened}} = 3.14$. A comparison of the means of each juice pair using a paired sample t-test was completed. Comparing the mixed berry pomegranate juice to the standard mixed berry juice resulted in a paired sample t-test as follows: $M = 1.93$, $SD = 3.24$, $t(42) = 3.90$, $p = .00$. Comparing the mixed berry acai juice to the standard mixed berry juice resulted in
a paired sample t-test as follows: $M = 1.79, SD = 3.60, t (42) = 3.25, p = .00$. Comparing the mixed berry juice sweetened with agave syrup to the standard mixed berry juice sweetened with fructose resulted in a paired sample t-test as follows: $M = .72, SD = 4.01, t (42) = 1.17, p = .24$.

These means demonstrate that participants were more likely to sample the healthy version of the mixed berry pomegranate and acai juice than the standard version of the mixed berry juice. Participants would try the naturally sweetened mixed berry juice, as often as they would try the standard mixed berry juice. These means are not consistent with my assumption.

Participants believed that the mixed berry juices (pomegranate, acai and naturally sweetened) were healthier, and less sweet than the standard version of the product. On average participants believed that the healthier version of the mixed berry juice was slightly healthier than the standard version. For the mixed berry pomegranate juice, the means and one-sample t-tests are as follows: $M_{Pomegranate} = 5.28, SD = 1.00, t (42) = 8.32, p = .00$. For the mixed berry acai juice, the means and one-sample t-tests are as follows: $M_{Acai} = 5.42, SD = .66, t (42) = 14.03, p = .00$. For the mixed berry juice sweetened with agave syrup, the means and one-sample t-tests are as follows: $M_{NaturallySweetened} = 5.30, SD = .96, t (42) = 8.85, p = .00$. These means are out of 7 and are being compared to the midpoint (4) of no difference. The one-sample t-test reveal that the means for relative healthfulness was statistically different than the midpoint (4) of no difference, such that participants did believe the healthier version of each juice was healthier than the standard version. Lastly, on average participants believed that the healthier version of the mixed berry juices was slightly less sweet than the standard version. For the mixed berry pomegranate juice the means and one-sample t-tests are as follows: $M_{Pomegranate} = 3.21, SD = 1.30, t (42) = -3.98, p = .00$. For the mixed berry acai juice, the means and one-sample t-tests are
as follows: $M_{\text{Acai}} = 3.42, SD = 1.20, t (42) = -3.17, p = .00$. For the mixed berry juice sweetened with agave syrup the means and t-tests are as follows: $M_{\text{Naturally Sweetened}} = 3.60, SD = 1.45, t (42) = -1.78, p = .08$. These means are out of 7 and are being compared to the midpoint (4) of no difference. The one-sample t-test reveal that the means for relative sweetness was statistically different than the midpoint (4) of no difference, such that participants did believe that the healthy version of the juices were sweeter than the standard versions.

The means for the avocado brownie demonstrated that participants were not willing to try it. Willingness to sample the Avocado Brownie was 4.76, compared to a median of 4 (neither likely nor unlikely to sample) and out of 7. The results of the one-sample t-tests are as follows: $M = 4.76, SD = 1.81, t (42) = 2.71, p = .01$, these results reveal that the means for willingness to sample was statistically different than the midpoint (4) of neither likely nor unlikely. On average participants were willing to take home 2.72 avocado brownies and 4.28 standard brownies. The results of the paired sample t-tests are as follows: $M = -1.55, SD = 3.27, t (42) = -3.11, p = .00$. These results demonstrate that participants were neither likely nor unlikely to sample the avocado brownie and they would bring home fewer avocado brownies than the number of standard brownies they would bring home. Participants did feel that the avocado brownie was healthier than the standard version, rated on average 5.28, compared to the median of 4 (no difference), and out of 7. The results of the one-sample t-test are as follows: $M = 5.28, SD = .73, t (42) = 11.42, p = .00$. These results reveal that participants response was statistically different than the midpoint (4) of no difference. Participants did feel that the avocado brownie was less sweet than the standard version, rated on average 3.37, compared to the median of 4 (no difference), and out of 7. The results of the one-sample t-test are as follows: $M = 3.37, SD = \ldots$
1.02, \( t(42) = -4.02, p = .00 \). These results reveal that participants response was statistically different than the midpoint (4) of no difference.

The results of the product pair, kale chips vs. potato chips, demonstrated that participants thought that the kale chips were moderately healthier than the standard version (potato chips), rated on average 6.65 compared to a median of 4 (no difference) and out of 7. The results of the one-sample t-tests are as follows: \( M = 6.65, SD = .52, t(42) = 32.84, p = .00 \). These results reveal that a participant’s answer was statistically different than the midpoint (4) of no difference. Participants believed that the kale chips were moderately less savoury than the potato chips, rated on average 2.09 compared to a median of 4 (no difference) and out of 7. The results of the one-sample t-tests are as follows: \( M = 2.09, SD = 1.06, t(42) = -11.74, p = .00 \). These results reveal that a participant’s answer was statistically different than the midpoint (4) of no difference. Willingness to sample the kale chips was 4.21 compared to a median of 4 (neither likely nor unlikely to sample) and out of 7. The results of the one-sample t-tests are as follows: \( M = 4.21, SD = 2.09, t(42) = .65, p = .51 \). These results reveal that a participant’s answer was not significantly different than the midpoint (4) of neither likely nor unlikely. Investigating further into the number of bags (total of 7) of each (kale chips or potato chips) they would like to bring home, it was found that participants would be willing to take home on average 2.21 bags of kale chips and on average 4.79 bags of potato chips. The results of the paired sample t-test are as follows: \( M = -2.58, SD = 3.60, t(42) = -4.79, p = .00 \). These results reveal that participants wanted to sample the potato chips more often than the kale chips.

Based on the criteria explained above, the mixed berry juices were not used in the main study. Though participants believed that the healthier version was healthier and less sweet than
the standard version, participants were still willing to sample the product (i.e. there was no
hesitancy in their choice). The avocado brownie was eliminated, though the avocado brownie
met all the criteria, it was believed that the kale chips had more of a taste aversion than avocado
brownies. Due to these results kale chips vs. a standard version (potato chips) was chosen as the
product pair to be used in the main study.

4.1.5 Discussion

The purpose of the pre-test was to determine the product that should be used in the main
study. Due to the purpose of the pre-test, descriptive statistics were used to determine the product
that should be used. Based on the descriptive statistics that were performed on the 5 product
pairs participants were shown, kale chips vs. a standard potato chip was chosen as the product
pair to be used in main study.

The kale chips were chosen versus the other pairs of products, as there is some hesitance
when sampling, as evidenced by the willingness to sample measure and the number of bags they
would be willing to take home. By using the kale chips, it can be insured that participants are not
willing to sample due to a taste preference; as they believed it was less savoury than the standard
version, or even a health preference; as they believed it was only moderately healthier, but
because of an environmental cue from a previous participant.

4.2 Study 2: Main Study

The purpose of this study was to determine the main effect of environmental cues on food
choice, and the interaction effects of environmental cue and the desire to affiliate; represented as
group membership, on food choice. This study was a 2 (Environmental Cue: Healthy vs.
Unhealthy) x 2 (Group Membership: High desire to affiliate - In-group vs. Low desire to affiliate - Out-group) between subject’s design. The environmental cue will be the wrapper of a healthy snack (i.e. kale chips) or standard (unhealthy) version (i.e. potato chips). Group membership was manipulated by telling participants by the academic standing of the previous fictitious participants. Due to the study sample, all participants were undergraduate students, therefore participants were told that the previous participants were undergraduate students (i.e. in-group) or graduate students (i.e. out-group). Graduate students were used as an out-group to undergraduate students due to the work completed by Berger and Heath (2008).

4.2.1 Participants

134 participants were recruited from SONA - Marketing and Consumer Studies and using posters that were placed around the University of Guelph campus. Students from SONA received 2% course credit for participating in this study and were also entered in a draw to win 1 of 10 prizes of $10 amazon.ca gift cards. Students recruited through the posters were financially compensated with a $10 amazon.ca gift card.

4.2.2 Methods

Participants were recruited under the guise of evaluating travel itineraries. Up to 10 participants were directed into a room, where they were seated at desks that are separated by panels. On each desk there was a travel itinerary, laying on top of the survey package which has been turned to the back side (blank side). The desk had a cubicle number and a pen. The desk also had one crumpled bag which was associated with the environmental cue condition that they were a part of. A green bag indicated a previous participant choose kale chips and a white bag indicated a previous participant chose potato chips. On each desk there were two tickets with
blurbs for each food choice, green tickets indicated kale chips and light-yellow tickets indicated potato chips. An illustration of how each desk appeared can be found in Appendix G – Main Study Methods.

Upon sitting at the desk participants were given consent forms to read and complete. As participants were completing the consent form, they are made aware of what was on the TV screen. The pictures and information blurbs associated with the snack choice that participants would be asked to make are illustrated in Figure 5. This picture and information blurb allowed participants to make a connection between the choice and the colour of chip bag and the colour of chip bag that is on their desk.

**Kale Chips**

vitKrazy is a European Company that has recently launched a new product in Ontario. vitKrazy wants to create a veggie chip using Kale, a dark leafy green. Dark leafy greens are high in antioxidants and help prevent cancer. But on the other hand, the higher the antioxidants and chlorophyll, the bitter the kale chips will be. The kale chip will be flavoured with salt to slightly reduce its bitter flavour.

**Potato Chips**

Chipper is a European Company that has recently launched a new product in Ontario. Their product is a potato chip that uses a European method of frying. Due to this process the potato chips becomes more saturated in fats. The high saturation of fats, causes the potato chip to be heavier than an American Chip.

Figure 5: Information Blurb and Picture on TV Screen

The manipulation of the majority choice from previous participants was delivered by the experimenter talking about the similarities or difference between undergraduate and graduate students. In the in-group condition (undergraduate students), the experimenter said “I ran this
experiment with undergraduate students earlier, and 80% of them choose the (kale/potato) chips. Though you guys come from different majors, when you spend 4 or 5 years at the same school you start to develop similar characteristics”. In the out-group condition (graduate students), the experimenter said “I ran this experiment with Graduate students earlier, and 80% of them choose the (kale/potato) chips. They are just so different from undergraduate students. Only about 5% of students will go on to do a post graduate degree, so it takes a particular kind of person to be motivated enough to continue schooling when most undergraduate students want to simply pursue a career once they graduate”. Participants were asked to turn over their survey and to write down three similarities to undergraduate students in the in-group condition, or three differences to graduate students in the out-group condition. In the in-group condition, the experimenter said, “If you could turn the survey over and answer the first question, about your similarities to undergraduate students.” In the out-group condition, the experimenter said, “If you could turn the survey over and answer the first question, about your differences to graduate students.”

The experimenter went around to each desk and collected the garbage in a box lid. The box lid enabled participants to see the previous participants crumpled snack bags, participants were asked to place the bag in the box lid in order to make a connection with the colour bag and the choice that the previous participants made. An illustration of what the box lid and bags looked like can be found in Figure 6. Upon collecting the garbage from each desk, the experimenter reiterated who was previously in the lab and which snack they choose. The experimenter said, “from what I can see about 80% of (Grad/Undergrad) students choose the (kale/potato) chips”.
Upon the last statement about majority choice, the experimenter went around the room to collect the ticket, indicating the current participants choice. The experimenter said “I will be coming around shortly to gather your choice of snack. Just pass me the ticket that you would like. Green for kale chips and light yellow for potato chips. Please do not say it out loud. You may start the survey”. The experimenter went around and collected the ticket, while participants completed the survey. The tickets that were collected can be found in Figure 7, each ticket was associated with a cubicle number.
The questionnaire asked participants questions about the travel itinerary; as per the cover story, a second question on their choice of snack; used as a sensitivity measure, demographic questions (age, gender, weight and height), manipulation check questions and participants were asked to record their cubicle number. Once all participants completed the questionnaire, they were debriefed about the true nature of the study, consent was collected once more and they were asked to keep the nature of the study confidential.

4.2.3 Measures

Two dependent variables were collected in order to determine the choice of the healthy or unhealthy snack. The first was a binary choice, in which participants were asked which type (healthy vs. standard version) of snack they would choose. A second dependent variable was added to add sensitivity to the measure. The second dependent variable was a continuous measure from 0 – 7. Participants were asked if given the choice, how many of each type (healthy vs. standard) of the snack they would bring home. The following are the questions, not including travel itinerary questions, that were asked to participants.

4.2.3.1 Binary Choice Dependent Variable

The first dependent variable; coded as Binary Choice, is measured prior to the start of the survey, when the experimenter asked participants to pass a ticket; green denoted kale chips and coded as 2, light yellow denoted potato chips and coded as 1, associated with a snack type.
4.2.3.2 Continuous Measure of Choice Dependent Variable

The following is the question asked to each participant, denoting the continuous dependent variable measure, coded as No. of Kale Chips Chosen and No. of Potato Chips Chosen. “If you had the choice to bring 7 bags (in total) of 100 grams each, of the chips presented to you in this survey home, how many of each type (Kale chips or Potato chips) would you choose?”

<table>
<thead>
<tr>
<th>Kale Chips</th>
<th>Potato Chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>

4.2.3.3 Demographic Questions and Manipulation Check Questions

Participants were asked demographic questions, which are described below, the full question and response set can be found in Appendix H – Main Study Measures.

Participants were asked demographic questions concerned with age, year of study, cubicle number, height and weight and gender.

Manipulation questions were as follows: “What do you think the aim of the study was?” This was an open-ended question. “Did you notice the wrapper left behind by previous participants?” This variable was coded as yes (1), I don’t know (2) and no (3). “What did the previous participants choose?” This was an open-ended question “Would you say that the snack choice of previous participants influenced your own decision?” This variable is coded as Perception of Influence and was measured on a 7 point scale: strongly agree (1), moderately
agree (2), slightly agree (3), neither agree nor disagree (4), slightly disagree (5), moderately disagree (6) and strongly disagree (7). “Why were you or why were you not influenced by the snack choice of previous participants?” This was an open-ended question.

4.2.4 Results

After accounting for non-consenting participants, missing data and incomplete surveys, a sample size of 116 (n = 116, 25% female) participants were analyzed.

Environmental Cue and Group Membership are independent variables that led to a 2x2 experiment. The Environmental Cue variable consisted of a healthy snack cue and an unhealthy snack cue, in which participants saw a healthy or unhealthy snack cue in the form of wrappers. Environmental Cue was coded as: 1 – Unhealthy Cue (white bag), 2 – Healthy Cue (green bag). The Group Membership variable consisted of in-group (undergraduate students) and out-group (graduate students), in which participants were told that previous participants were either fellow in-group members (undergraduate students) or dissimilar out-group members (graduate students). Group Membership of previous participants was coded as: 1 – Undergraduate Student (in-group), 2 – Graduate Student (out-group). Binary Choice represents the initial choice that participants made when asked which type of chip they would like, Choice was coded as 1 – potato chips and 2 – kale chips. No. of Kale Chips Chosen represents the number of kale chips they would bring home if they had the chance to bring home a total of 7 bags, kale or potato chips. No. of Kale Chips Chosen was entered based on the number of bags they would like to bring home (i.e. 1 bag of kale chips – 1).
4.2.4.1 Manipulation Check

A manipulation check was used to identify if participants noticed the bag that was left behind by previous participants and was further confirmed by their response to what colour bag was left behind.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noticed</td>
<td>116</td>
<td>1</td>
<td>3</td>
<td>1.19</td>
<td>.574</td>
</tr>
</tbody>
</table>

Table 2: Manipulation Check - Did Participants Notice the Bag Left Behind?

Table 2 looked at the descriptive statistics for the question “Did you notice the bag that was left behind by previous participants”. The question was coded as Yes (1), I don’t know (2) and No (3). Based on the descriptive statistics participants noticed the bag left behind by previous participants an average of 1.19.

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noticed</td>
<td>-33.997</td>
<td>115</td>
<td>.000</td>
<td>-1.810</td>
<td>-1.92 to -1.70</td>
</tr>
</tbody>
</table>

Table 3: One-Sample Test – “Did Participants Notice the Bag Left Behind?”

Investigating further into a one-sample t-test (See Table 3), using a test value of 3, there was a significant difference between if participants noticed the bag left behind by previous participants (Yes - 1) from the response if participants did not notice the bag left behind by previous participants (No - 3) $(t (116) = -33.99, p = .00)$. Thusly, participants did notice the bag that was left behind which indicates that the manipulation for environmental cue was effective.
<table>
<thead>
<tr>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Cue</td>
</tr>
<tr>
<td>Environmental Cue</td>
</tr>
<tr>
<td>Noticed</td>
</tr>
<tr>
<td>Previous Participant Choice</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4: Manipulation Check – “What was the Previous Participants Choice?”

The correlations table (see Table 4), investigated the correlations between the healthfulness cue, and if participants noticed a previous participants choice as well as what a participant believed that choice was. Previous participants choice was coded as Kale Chips (1), I don’t know (2) and Potato Chips (3). Based on the correlations table, healthfulness cue and a previous participants choice was significantly correlated ($r = -.70, p = .00$). Participants who were in the healthy snack cue condition correctly identified a previous participants choice to be the kale chips. Thusly, the environmental cue manipulation was successful as participants noticed the bag, and correctly identified the colour of the bag.

4.2.4.2 Normality Tests for No. of Kale Chips Chosen

The following (see Table 5) is the test of Normality for data points No. of Kale Chips Chosen. This was a continuous variable ranging from 0 – 7.

<table>
<thead>
<tr>
<th>Tests of Normality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kolmogorov-Smirnov$^a$</td>
</tr>
<tr>
<td>Statistic</td>
</tr>
<tr>
<td>No. of Kale Chips Chosen</td>
</tr>
</tbody>
</table>

Table 5: Normality Test of No. of Kale Chips
Due to the sample size being less than 2000, Shapiro-Wilk’s analysis must be used to analyze the normality of the data (Razali & Wah, 2011), as seen in Table 5. Using the Shapiro-Wilk’s analysis yielded a significant result \((p < .01)\), which indicated that the data is not on a normal curve (Razali & Wah, 2011). Based on the histogram of the No. of Kale Chips data (Figure 3); found below, the data appears to be right skewed \((M = 2.65, SD = 1.785, N = 116)\).

![No. of Kale Chips Histogram](image)

**Figure 8: Histogram of No. of Kale Chips Chosen**

Therefore, the data was transformed into logarithm, natural log, and into square root data points. The data transformed into log10 and ln will not be used, as the transformation of the data created missing data points. The transformation of data into square root form, resulted in data points that can be used.

Upon the transformation into square root, the Shapiro-Wilk analysis yielded a significant result \((p < .01)\), which indicated that the square root transformed variable is not on a normal curve. The table for Test of Normality can be found in Appendix I – Normality Tests, Table I1.
Based on the histogram of No. of Kale Chips (sqrt) found in Appendix I – Normality Tests, Figure II, the data appears to be right skewed ($M = 1.46$, $SD. = 0.72$, $N = 116$).

Based on this analysis, the variable that was be used for subsequent analysis was the original variable of choice. For the purposes of this study, it is necessary to acknowledge that the No. of Kale Chips Chosen data is not normally distributed moving forward.

4.2.4.3 Bi-variate Analysis of All Variables

The correlations between variables are illustrated in Table 6. The correlations output for all variables can be found in Appendix J – Correlations, Table J1. Based on the correlation table for all variables used in the study, some variables have been eliminated due to insignificance to the model.

<table>
<thead>
<tr>
<th></th>
<th>Choice</th>
<th>No. of Kale Chips Chosen</th>
<th>Age</th>
<th>Gender</th>
<th>Perception of Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice</td>
<td>1</td>
<td>.673**</td>
<td>.230*</td>
<td>.101</td>
<td>-.213*</td>
</tr>
<tr>
<td>No. of Kale Chips Chosen</td>
<td>1</td>
<td>.258**</td>
<td>.260**</td>
<td></td>
<td>-.219*</td>
</tr>
<tr>
<td>Age</td>
<td>1</td>
<td>.083</td>
<td></td>
<td></td>
<td>-.189*</td>
</tr>
<tr>
<td>Gender</td>
<td>1</td>
<td></td>
<td>.240**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perception of Influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 6: Correlations of Significant Variables

Weight, Height and Start Time were not significantly correlated with No. of Kale Chips Chosen. Weight, Height and Start Time were not significantly correlated with Binary Choice. Due to these insignificant correlations. Weight, Height and Start Time was dropped from the statistical analysis going forward.

93
Age and Year of Study were highly correlated ($r = 0.75, p < .01$). The high correlation between age and year of study, can be explained by the increasing age as participants go into higher years of study. Due to the high correlation between Age and Year of Study, Year of Study will be dropped from the analysis going forward.

The Perception of Influence variable is a participant’s perception of, if they were influenced by the previous participants choice or their own decision. Due to the high correlation between the Perception of Influence variable and No. of Kale Chips Chosen and Binary Choice, the Perception of Influence was kept in the analysis going forward.

Unexpectedly, No. of Kale Chips Chosen and Binary Choice was not significantly correlated with Group Membership ($p = .69, p = .83$ respectively). Group Membership is an independent variable and is required to determine the interaction effect. Thusly, Group Membership was entered into the analysis for formal testing of the hypothesis.

Binary Choice; kale chips was coded as 2 and potato chips was coded as 1, and Environmental Cue were significantly correlated ($r = 0.21, p = .02$). This means that participants who were in the healthy snack cue condition are more likely to choose kale chips, than participants in the unhealthy snack cue condition. Binary Choice was positively correlated with Age ($r = 0.23, p = .01$); such that older participants were more likely to choose kale chips than younger participants. Gender was found to not be significantly correlated with Binary Choice ($r = 0.10, p = .28$). Binary Choice was negatively correlated with Perception of Influence ($r = -0.21, p = .02$). Participants who believed that they were influenced by the choice of previous participants were more likely to choose kale chips as their choice.
No. of Kale Chips Chosen was significantly correlated with Environmental Cue at a marginal level ($r = 0.18$, $p = 0.05$). This indicates that participants who were in the healthy cue condition are more likely to choose a greater number of kale chips, than participants in the healthy snack cue condition. No. of Kale Chips Chosen was significantly correlated with Binary Choice ($r = 0.673$, $p < .01$). This indicates that participants whose initial choice was kale chips are more likely to choose more kale chips when asked how many they would take home, than participants who choose potato chips as their initial choice. No. of Kale Chips Chosen was positively correlated with Age, such that older participants are more likely to choose a greater number of kale chips than younger participants. No. of Kale Chips Chosen was positively correlated with Gender, such that female participants are more likely to choose a greater number of kale chips than male participants. No. of Kale Chips Chosen was negatively correlated with Perception of Influence ($r = -0.22$, $p = .01$). Participants who believed that they were not influenced by a previous participants choice were less likely to choose a large amount of kale chips to take home.

4.2.4.4 Logistic Regression Analysis of Binary Choice

A regression analysis was completed on Binary Choice, as Binary Choice was a choice between kale chips or potato chips. Potato chips was coded as 1 and is considered the base line for the logistic regression analysis. Kale chip was thusly coded as 2. The logistic regression analysis was completed using Binary Choice as the dependent variable and Environmental Cue, Group Membership and the Interaction variable (Environmental Cue * Group Membership) as the independent variables. Age, Gender and Perception of Influence were entered as covariates. Appendix K - Main Study Regression Analysis contains the Classification Table (see Table K1)
and Variables in the Equation for Block 0 Table (see Table K2), which creates a model to explain Binary Choice without using any explanatory variables. Based on these tables, the model correctly classified a participant’s choice 56.9% of the time ($p = 0.139$). Based on Block 0, the model was not a good predictor of choice. The following are the tables associated with Block 1.

The Model Summary for Block 1, as found in Appendix K - Main Study Regression Analysis (see Table K3), illustrates the Nagelkerke R Square value. The Nagelkerke R Square is an adjusted r-square value that covers a range from 0 to 1 (Nagelkerke, 1991). Based on the model summary the model explained 18.8% of the variance in the choice of kale or potato chips ($R^2 = 0.188$).

The following is the classification table for the regression analysis of Choice (see Table 7).

<table>
<thead>
<tr>
<th>Classification Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Binary Choice Potato</td>
</tr>
<tr>
<td>Kale</td>
</tr>
<tr>
<td>Overall Percentage</td>
</tr>
</tbody>
</table>

*a. The cut value is .500*

**Table 7: Classification Table of Regression Analysis of Binary Choice**

Based on the classification table the model that was proposed (using explanatory variables) correctly classified 68.1% of the cases. The model using explanatory variables correctly predicts a participant’s choice 11.2% more accurately than a model without explanatory variables.
The following table (see Table 8) is the Variables in the Equation table, that helps explain the significance of predictors to the model. The dependent variable is the binary choice of kale chips (coded as 2) or the potato chips (coded as 1).

<table>
<thead>
<tr>
<th>Variables in the Equation</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Sig.</th>
<th>Odds Ratio</th>
<th>95% C.I. for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Environmental Cue</td>
<td>2.43</td>
<td>1.36</td>
<td>3.17</td>
<td>.07</td>
<td>11.41</td>
<td>.78</td>
</tr>
<tr>
<td>Group Membership</td>
<td>1.70</td>
<td>1.36</td>
<td>1.57</td>
<td>.21</td>
<td>5.51</td>
<td>.38</td>
</tr>
<tr>
<td>Environmental Cue * Group</td>
<td>-.95</td>
<td>.83</td>
<td>1.29</td>
<td>.25</td>
<td>.38</td>
<td>.07</td>
</tr>
<tr>
<td>Membership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.32</td>
<td>.16</td>
<td>3.86</td>
<td>.04</td>
<td>1.38</td>
<td>1.00</td>
</tr>
<tr>
<td>Gender</td>
<td>.24</td>
<td>.47</td>
<td>.25</td>
<td>.61</td>
<td>1.27</td>
<td>.50</td>
</tr>
<tr>
<td>Perception of Influence</td>
<td>-.18</td>
<td>.10</td>
<td>2.89</td>
<td>.08</td>
<td>.83</td>
<td>.67</td>
</tr>
<tr>
<td>Constant</td>
<td>-9.97</td>
<td>4.19</td>
<td>5.64</td>
<td>.01</td>
<td>.00</td>
<td></td>
</tr>
</tbody>
</table>

a. Variable(s) entered on step 1: Environmental Cue, Group Membership, Age, Gender, Perception of Influence, Environmental Cue * Group Membership.

**Table 8: Variables in the Equation for Regression Analysis for Binary Choice**

Based on the regression analysis, as illustrated in Table 8 Age did predict the dependent variable of Binary Choice ($p = .05$). Age was a predictor of Binary Choice, such that older participants are more likely to choose kale chips than younger participants ($B = 0.32$, *Odds Ratio* = 1.38). As age increased by 1-year, participants were 1.38 times more likely to choose kale chips than younger participants. Gender was not a significant predictor of Binary Choice ($p = 0.61$). Perception of Influence was marginally significant in determining Binary Choice ($p = 0.08$). Participants who believed that they were not influenced by the previous participants choice, were less likely to choose kale chips than participants who believed they were influenced by the previous participants choice ($B = -0.18$, *Odd Ratio*= 0.83).
The following are the analyses of the independent variables and the interactions effect. Group Membership was not a significant prediction of Binary Choice ($p = .21$). This indicates that group membership (i.e. in-group/ out-group membership) did not influence a participant’s choice of potato or kale chips.

Environmental Cue was a marginally significant in predictor of the Binary Choice ($p = 0.075$). Participants in the Healthy Snack Cue condition were more likely to choose kale chips than those in the Unhealthy Snack Cue condition ($B = 2.43$, *Odds Ratio* = 11.41). Participants in the Healthy Snack Cue condition were 11.414 times more likely to choose the kale chips than participants in the Unhealthy Snack Cue condition.

Based on the logistic regression analysis, as illustrated in Table 8, the Interaction Effect (Environmental Cue x Group Membership) was not significant in determining a participant’s choice ($p = 0.25$).

<table>
<thead>
<tr>
<th>Environmental Cue (A)</th>
<th>Group Membership (B)</th>
<th>Interaction effect (A x B)</th>
<th>Probability of Condition</th>
<th>$1/(1+\exp(-p))$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhealthy Cue</td>
<td>Undergrad Student</td>
<td>1</td>
<td>-4.5</td>
<td>0.01</td>
</tr>
<tr>
<td>Unhealthy Cue</td>
<td>Graduate Student</td>
<td>2</td>
<td>-1.84</td>
<td>0.13</td>
</tr>
<tr>
<td>Healthy Cue</td>
<td>Undergrad Student</td>
<td>1</td>
<td>-1.11</td>
<td>0.24</td>
</tr>
<tr>
<td>Healthy Cue</td>
<td>Graduate Student</td>
<td>2</td>
<td>2.49</td>
<td>0.92</td>
</tr>
</tbody>
</table>

**Table 9: Logistic Regression Probabilities**

The following are the probabilities of Environmental Cue, Group Membership and the interaction effect, including the covariates of age, gender and perception of influence. The probabilities of selecting kale chips in each condition can be found in Table 9 above. Figure 9
below demonstrates the probabilities in a graph format. The probability of a participant selecting kale chips, when they are in an unhealthy snack cue condition, and in the in-group membership condition was (Condition 1, 1) 1% ($p < .01$). The probability of a participants selecting kale chips, when they are in an unhealthy snack cue condition and in the out-group membership condition (Condition 1, 2) was 13% ($p = .13$). The probability of a participant selecting kale chips, when they are in the healthy snack cue condition and in the in-group membership condition (Condition 2, 1) was 24% ($p = .24$). The probability of a participant selecting kale chips, when they are in the healthy snack cue condition and in the out-group membership condition (Condition 2, 2) was 92% ($p = 0.92$).

![Probabilities of Selecting Kale Chips in Each Condition](image)

**Figure 9: Probabilities of Selecting Kale Chips in Each Condition**

When comparing these probabilities, it can be seen that the probability of choosing kale chips increases when participants are exposed to a healthy snack cue (24% and 92%).
respectively). It is also noteworthy to consider the differences found between the unhealthy snack cue conditions, based on the analysis of probability, there was slight difference of group membership on the choice of kale chips. When comparing the healthy cue conditions, it was found that group membership creates a large difference in the choice of kale chips.

The logistic regression analysis of Binary Choice identified that Environmental Cue was marginally significant in predicting a participant’s choice, thusly hypothesis 1 was supported although based on a marginal significance. The interaction effect was not found based on the logistic regression. Group membership did have an influence when looking into the analysis of probabilities, as participants in the both environmental cue conditions and exposed to a previous participant in the out-group (graduate) has a greater probability of choosing kale chips. Due to these results hypothesis 2A and 2B were not supported by the Binary Choice variable, as the probabilities demonstrated that participants chose more kale chips when exposed to members from the out-group (graduate).

4.2.4.5 ANOVA Analysis of No. of Kale Chips Chosen

An ANOVA analysis was run on No. of Kale Chips Chosen, as the variable is continuous, ranging from 0 to 7 (see Table 10). Based on the Normality tests run earlier, the data for No. of Kale Chips Chosen is not normally distributed and has an adjusted r-squared of ($r^2 = 0.013$)
Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>14.10a</td>
<td>3</td>
<td>4.70</td>
<td>1.49</td>
<td>.22</td>
<td>.03</td>
</tr>
<tr>
<td>Intercept</td>
<td>790.91</td>
<td>1</td>
<td>790.91</td>
<td>251.36</td>
<td>.00</td>
<td>.69</td>
</tr>
<tr>
<td>Environmental Cue</td>
<td>12.16</td>
<td>1</td>
<td>12.16</td>
<td>3.86</td>
<td>.05</td>
<td>.03</td>
</tr>
<tr>
<td>Group Membership</td>
<td>1.12</td>
<td>1</td>
<td>1.12</td>
<td>.35</td>
<td>.55</td>
<td>.00</td>
</tr>
<tr>
<td>Environmental Cue *</td>
<td>1.63</td>
<td>1</td>
<td>1.63</td>
<td>.51</td>
<td>.47</td>
<td>.00</td>
</tr>
<tr>
<td>Group Membership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>352.40</td>
<td>112</td>
<td>3.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1179.00</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>366.50</td>
<td>115</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Unhealthy * Group Membership

Table 10: ANOVA of No. of Kale Chips Chosen

Based on the ANOVA analysis the main effect of Environmental Cue was marginally significant in determining the number of kale chips that were chosen ($F (3, 111) = 3.87, p = .05$). The choice of kale chips was significantly higher when participants were exposed to the healthy snack cue (green bag) ($M_{Healthy\, Snack\, Choice} = 2.95$) than when they were exposed to the unhealthy snack cue condition (white bag) ($M_{Unhealthy \, Snack\, Choice} = 2.32$). Based on the ANOVA analysis, hypothesis 1 (main effect) was supported.

Group Membership was not significant in determining the number of kale chips that were chosen ($F (3, 111) = 0.35, p = .55$). The ANOVA analysis also determined that the interaction effect of Environmental Cue and Group Membership was not significant in determining the number of kale chips that were chosen ($F (3, 111) = 0.51, p = .47$). Due to these results the interaction effect was not significant, and thusly hypothesis 2A and 2B were not supported.
### Descriptive Statistics

**Dependent Variable:** No. of Kale Chips Chosen

<table>
<thead>
<tr>
<th>Environmental Cue</th>
<th>Group Membership</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhealthy Cue</td>
<td>In-group</td>
<td>2.08</td>
<td>1.63</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Out-group</td>
<td>2.52</td>
<td>1.71</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.32</td>
<td>1.67</td>
<td>56</td>
</tr>
<tr>
<td>Healthy Cue</td>
<td>In-group</td>
<td>2.97</td>
<td>2.04</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Out-group</td>
<td>2.93</td>
<td>1.63</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.95</td>
<td>1.84</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>In-group</td>
<td>2.58</td>
<td>1.90</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Out-group</td>
<td>2.71</td>
<td>1.67</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.65</td>
<td>1.78</td>
<td>116</td>
</tr>
</tbody>
</table>

Table 11: Descriptive Statistics of No. of Kale Chips Chosen

### Pairwise Comparisons

**Dependent Variable:** No. of Kale Chips Chosen

<table>
<thead>
<tr>
<th>Environmental Cue</th>
<th>(I) Group Membership</th>
<th>(J) Group Membership</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig. a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhealthy Cue</td>
<td>In-group</td>
<td>Out-group</td>
<td>-.436</td>
<td>.477</td>
<td>.362</td>
</tr>
<tr>
<td></td>
<td>Out-group</td>
<td>In-group</td>
<td>.436</td>
<td>.477</td>
<td>.362</td>
</tr>
<tr>
<td>Healthy Cue</td>
<td>In-group</td>
<td>Out-group</td>
<td>.040</td>
<td>.459</td>
<td>.930</td>
</tr>
<tr>
<td></td>
<td>Out-group</td>
<td>In-group</td>
<td>-.040</td>
<td>.459</td>
<td>.930</td>
</tr>
</tbody>
</table>

Based on estimated marginal means

Table 12: Pairwise Comparisons of Environmental Cue and Group Membership
Figure 10: Estimated Marginal Means of No. of Kale Chips Chosen

Table 11 shows the marginal means of No. of Kale Chips Chosen, based on these marginal means an estimated marginal means bar chart was created. Figure 10 demonstrates the marginal means for No. of Kale Chips Chosen. The pairwise comparisons of the marginal means were completed (see Table 12), it can be seen that the means for the unhealthy snack cue was not significant between in-group and out-group membership ($p = .36$), and the means for the healthy snack cue was not significant between in-group and out-group membership ($p = .93$).

### 4.2.4.6 ANCOVA Analysis of No. of Kale Chips Chosen

An ANCOVA was run on the dependent variable (see Table 13); No. of Kale Chips Chosen. An ANCOVA analysis was run in order to determine the effects that covariates have on the choice of No. of Kale Chips Chosen. Based on the ANCOVA analysis, similar results are expected to those found in the ANOVA analysis. The covariates that were chosen were based on
the correlations test (see Table 6). Age, Gender and Perception of Influence were added as covariates. The adjusted r squared value was \(r^2 = 0.13\)

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>64.18(^a)</td>
<td>6</td>
<td>10.69</td>
<td>3.85</td>
<td>.00</td>
<td>.17</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.83</td>
<td>1</td>
<td>3.83</td>
<td>1.38</td>
<td>.24</td>
<td>.01</td>
</tr>
<tr>
<td>Environmental Cue</td>
<td>10.43</td>
<td>1</td>
<td>10.43</td>
<td>3.76</td>
<td>.05</td>
<td>.03</td>
</tr>
<tr>
<td>Group Membership</td>
<td>2.14</td>
<td>1</td>
<td>2.14</td>
<td>.77</td>
<td>.38</td>
<td>.00</td>
</tr>
<tr>
<td>Environmental Cue * Group Membership</td>
<td>1.55</td>
<td>1</td>
<td>1.55</td>
<td>.56</td>
<td>.45</td>
<td>.00</td>
</tr>
<tr>
<td>Age</td>
<td>15.84</td>
<td>1</td>
<td>15.84</td>
<td>5.71</td>
<td>.01</td>
<td>.05</td>
</tr>
<tr>
<td>Gender</td>
<td>15.38</td>
<td>1</td>
<td>15.38</td>
<td>5.54</td>
<td>.02</td>
<td>.04</td>
</tr>
<tr>
<td>Perception of Influence</td>
<td>5.45</td>
<td>1</td>
<td>5.45</td>
<td>1.96</td>
<td>.16</td>
<td>.01</td>
</tr>
<tr>
<td>Error</td>
<td>302.32</td>
<td>109</td>
<td>2.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1179.00</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>366.50</td>
<td>115</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 13: ANCOVA Analysis of No. of Kale Chips Chosen**

Based on the ANCOVA analysis, Age was a significant covariate in determining the number of kale chips that were chosen \(F (3, 111) = 5.71, p = .01\). This means that when age increased there was an increase in the number of kale chips that are chosen. Gender was a significant covariate in determining the number of kale chips that were chosen \(F (3, 111) = 5.54, p = .02\). This means that female participants were more likely to choose a greater number of kale chips than males.

The ANCOVA analysis also determined that Perception of Influence was not significant in determining the number of kale chips chosen \(F (3, 111) = 1.96, p = .16\). Thusly, participants
perception of influence (i.e. if they believed that others behaviour influenced their own) was not significant in determining the number of kale chips that were chosen. Even once the covariates were taken into account, the same pattern emerged for the main effect and interaction effect as in the ANOVA analysis.

Based on the ANCOVA analysis, as with the ANOVA analysis Environmental Cue was significant in determining the number of kale chips that were chosen ($F (3, 111) = 3.76, p = .05$). As participants who were in the healthy snack cue condition were more likely to choose a greater number of kale chips than those in the unhealthy snack cue condition.

Based on the ANCOVA analysis, as with the ANOVA analysis Group Membership and the Interaction Effect of Environmental Cue x Group Membership was determined to not be significant in influencing the number of kale chips chosen ($p = .38$ and .45 respectively).

Based on the ANCOVA analysis, hypothesis 1 (main effect) was supported, as Environmental Cue was significant in determining the number of kale chips chosen. The interaction effect was not found and thusly, hypothesis 2A and 2B were not supported.

5 CHAPTER 5: Discussion

5.1 General Discussion

The present research wanted to answer the questions: how social norms and a desire to affiliate interact in the choice of healthy or unhealthy food. The main effect for this research, is that the social norm will act as a social proof heuristic such that the choice of a healthy or unhealthy food will be influenced by the environmental cue present. Hypothesis 1 was; participants exposed to an environmental cue denoting the choice of healthy food by previous
consumers will be more likely to choose the healthy option than participants exposed to the environmental cue denoting the choice of unhealthy foods. The interaction effect takes into consideration the desire to affiliate as a moderator to environmental cues and the choice of healthy and unhealthy foods. Hypothesis 2A was; participants who are exposed to an environmental cue denoting dominant choice of the healthy version of a snack product by previous consumers are more likely to choose the healthy version over the standard version of a snack product if the previous consumers are inferred to be members of an in-group versus outgroup of participants. Hypothesis 2B was; participants who are exposed to an environmental cue denoting dominant choice of the standard version of a snack product by previous consumers are more likely to choose the healthy version over the standard version of a snack product if the previous consumers are inferred to be members of an out-group versus in-group of participants, which is an avoidance motive.

Based on the logistic regression, ANOVA and ANCOVA analysis a conclusion can be made on the hypotheses proposed in this study. Overall, hypothesis 1 (main effect) was supported by the study, hypothesis 2A and 2B (interaction effects) were not supported by the study.

This research wanted to consider the impact that social influence has on the choice of a healthy and unhealthy product, using an environmental cue. This research also wanted to consider the interaction of the desire to affiliate (denoted as group membership) and an environmental cue has on the choice of healthy and unhealthy foods. Past research supports the claim that social influence does have an effect on food choice, such as with a healthy and unhealthy food choice (Robinson & Higgs, 2012). Past research also supports that the desire to
affiliate does have an influence on a consumer’s food intake (Cruwys et al. 2012) and food choice (Berger & Heath, 2008).

The main study was used to test the interaction effect of environmental cue and group membership on food choice. The interaction effect that was proposed is the unique contribution to the literature. The logistic regression, ANOVA and ANCOVA analysis produced results that do not support the interaction effect. Thusly, hypothesis 2A and 2B were not supported by this study. Regardless of a previous fictitious participants group membership (in-group or out-group) participants choose more kale chips when they were exposed to a healthy environmental cue than when they were exposed an unhealthy environmental cue. The interaction of Environmental Cue and Group membership was not significant in determining a participant’s choice, which may be a reflection of the manipulation that was used for group membership. The manipulation that was used, consisted of using undergraduate vs. graduate students as the in-group/out-group manipulation, and asking participants to write down similarities to the in-group or differences to the out-group, after hearing a standardized speech on the similarities to the in-group, or dissimilarities to the out-group; based on their condition. The first instance of majority choice (i.e. hearing about what makes participants similar to the in-group, or different from the out-group), was used as a means to strengthen the cognitive distance between the in-group and out-group but may have evoked negative feelings which would affect the manipulation. Though participants were exposed to two manipulations of majority choice during the study, as a means to make the information about in-group and out-group salient, the second reiteration of majority choice may have interfered with the first, causing participants to dismiss the thought, and resulted in participants not being affected by the group membership of previous participants.
These results do not reflect past research that has found that an environmental cue as denoted by persuasive messages, will lead consumers to model the patterns of the in-group or avoid the patterns of the out-group’s prior choices. Past research has found that persuasive messages can be used to get consumers to choose healthier foods (Berger & Rand, 2008), and similarly a group norm that supports unhealthy eating will lead consumers to choose and consume unhealthy foods (Louis et al., 2007, Stok et al., 2012, Berger & Heath, 2008). The absence of supporting results can be due to the manipulation of group membership. As the difference between undergraduate and graduate students may not have been strong enough to evoke a sense of avoidance, in acting according to the out-group.

The manipulation of social norms as an environmental cue, using group membership as a moderator has not been studied in the past. Past research has considered environmental cues as demonstrated by persuasive messages, which still indicates what others have done in the past within a similar situation but is not represented as a physical cue but as a statement of the majority action. Berger and Rand (2008), found that when participants were led to believe that eating junk food was associated with the out-group; by reading a news article, there was a greater instance of healthier food choices, within a cafeteria setting. The results of the present study are not supported by Berger and Rand’s finding, as regardless of the previous participants group membership there was an increase in the number of kale chips chosen when participants were exposed to a healthy environmental cue. The lack of supporting results can be due to the in-group/out-group manipulation not being tested in advance. Due to this, there is a lack of evidence if out-group member were really considered as out-group members within the food choice domain. This study used an environmental cue as demonstrated by a physical wrapper
(i.e. green bag vs. white bag), along with a general statement on what others have chosen in the past within that situation. Due to the lack of research within this area, there is no definitive evidence as to why there was no interaction effect, but there can only be speculations. Due to the lack of support for hypothesis 2A and 2B, there is greater support for hypothesis 1 (main effect of social influence).

A logistic regression analysis was completed on Binary Choice. An ANOVA and ANCOVA analysis were completed on the No. of Kale Chips Chosen. No. of Kale Chips Chosen was the number of kale and potato chips (total of 7) that participants would bring home. The results of the logistic Regression found support for the main effect (hypothesis 1), such that participants choose more kale chips when they were in the healthy snack cue condition (i.e. they saw the green bag) than participants in the unhealthy snack cue condition (i.e. they saw the white bag). The ANOVA analysis found support for the main effect (hypothesis 1) as participants chose to take home more kale chips when they were in the healthy snack cue condition (i.e. they saw the green bag) than participants in the unhealthy snack cue condition (i.e. they saw the white bag). The addition of covariates in the ANCOVA analysis did not change the pattern that was found in the ANOVA analysis. These results support past literature on social influence, such that participants are more likely to follow the social norm that is set out by the majority group (i.e. past participants), as the participants are led to believe that, that behaviour is the most correct behaviour and thusly, they will act accordingly.

The logistic Regression, ANOVA and ANCOVA analysis determined that there was no effect of Group membership. Based on the logistic regression analysis, the analysis of probabilities determined that there was a small influence of group membership that supports
Hypothesis 2A, as participants choose kale chips more often when they believed that previous participants were in-group members and they also chose kale chips. Hypothesis 2A was not supported, as regardless of a previous participant being a member of the out-group participants still choose more kale chips when exposed to the healthy environmental cue. These results can be due to the group membership manipulation. This discrepancy will be discussed further in subsequent sections. This is not congruent with previous literature, that has found that group membership will have an influence on behaviour (Berger & Heath, 2008). Participants who were led to believe that members of a dissociative out-group had taken up certain behavioural patterns; commonly associated with the in-group, were more likely to abandon those behaviours (Berger & Heath, 2008). The lack of support for the interaction effect will be discussed further in subsequent sections.

Based on the logistic Regression and ANCOVA analysis, Age as a covariate was found to have an influence on a participant’s choice of healthy or unhealthy snack, as well as the number of kale chips that were chosen. Such that, older participants are more likely to choose the healthier choice, than younger participants. This shows that environmental cue and age have an interaction effect. Past research has found that social influence is not limited to any age but as people get older they are less influenced by choice of others as they have higher self-esteem and they have their own personal norms that govern their decisions (Cruwys et al., 2015). This was not tested within this study, so it can only be stated that older participants were more likely to choose the healthy version.

The ANCOVA analyses for the continuous variable of No. of Kale Chips Chosen determined that gender did have an influence on the number of kale chips that were chosen; such
that females were more likely to choose a greater number of kale chips than males. Unexpectedly, the logistic Regression analysis on Binary Choice yielded a result that indicates that Gender was not significant in determining a participant’s choice. Individual factors such as gender have been found to influence the following of a social norm, in which females are more likely to follow social norms than males (Higgs, 2015). This may be in part due to females being more interested in facilitating social bonds with others, thusly leading them to follow social norms more than males (Higgs, 2015). These results show that environmental cue and gender have an interaction effect.

Based on the logistic Regression and ANCOVA analysis the Perception of Influence was found to not be significant in determining Binary Choice and the number of kale chips that were chosen. This is congruent with past literature, as participants are aware of what others have consumed before them, but they believe that they were not influenced by the choice of others (Robinson & Field, 2015).

The analysis indicated the main effect of environmental cue, such that participants are more likely to choose the product that was supposedly chosen by the majority of the previous study session; regardless of the previous participants group membership. When participants were exposed to a healthy snack cue (i.e. green bag), they were more likely to choose the kale chips than the potato chips. On the other hand, participants exposed to the unhealthy snack cue (i.e. white bag), were more likely to choose the potato chips than the kale chips. This was evidenced by the Binary Choice and the No. of Kale Chips Chosen which was collected after participants completed the survey. This thusly supports hypothesis 1 (main effect) and supports what prior studies have identified, that consumers will match the consumption patterns (intake and choice)
of their dining partners and majority group (Cruwys et al., 2015). The results of this study provide greater support for the use of environmental cues in modifying consumers behaviour towards better actions. As participants followed the choice of out-group members. These findings are surprising, as past research has found that participants will want to avoid being associated with the out-group (Berger and Heath, 2008). Participants may have felt that graduate students are not different from them, therefore their food choice would not be different from their own. A second explanation can be aspirational, as participants may want to be more like graduate students and thusly would want to act as they would. Future research needs to conduct a pre-test to determine the which in-group/out-group membership to use within the snack food domain.

Due to the role that social influence has played in the creation of social norms that support the consumption of unhealthy foods, any evidence that suggests that social influence can be harnessed to create a positive change is a step in the right direction. The study supports the normative framework that states that individuals will follow social norms that are present in an environment to act accordingly. By creating social norms that support the consumption of healthy foods, through programs for example, there will be more environmental cues present during the food decision making process that will in turn lead consumers into making healthier choices. This will create a cycle, which is supported by a social norm that supports a healthy decision, which will in turn reinforce the social norm of the healthy decision. This cycle will create a pattern of healthy decisions when it comes to food choice and subsequently food intake.
5.2 Contributions and Implications

Given the results of this study, there are contributions to the social influence literature, such that there is increased support for the main effect of social influence. These results indicate that environmental cues do influence food choice, such that participants will choose healthy foods when the environmental cue indicates that a large number of in-group and out-group members have chosen this food previously.

The results of this study demonstrate implications for future studies. As stated above, there are no studies that have considered environmental cues as a means of social influence, along with group membership, that investigate the hypothesis proposed. The study results can be an indication of what future research needs to consider. Such as changing the environmental cue and group membership conditions to be more salient for participants. The limitation and considerations for future research will be discussed in the following section.

This study has identified that environmental cues can be used to promote healthier version of snacks, as found by the increased choice of kale chips in the healthy environmental cue condition. Further implications of this study are that social influence; namely environmental cues, can be used to positively influence the consumption patterns of individuals. Beyond academic and research implications, this study has managerial and policy implications.

Social influence and group membership have played a role in the under consumption of healthy foods. It is now time to understand and use social influence as a means to increase the consumption of healthy foods. The more research that is completed in the area of social influence, the more researchers will understand its role in food choice and intake. With this
knowledge policy makers and marketers can use social influence as a means to positively change behavior. This is rooted in the normative framework that states that individuals will have a tendency to follow the social norms that are set out by the majority group. Individuals use these social norms to create a social proof heuristic that acts as a shortcut for appropriate behavior in unknown situations.

Policy implications to consider; in terms of the University, is to have posters and other forms of cues that indicate to consumers and students, that other consumers and students have chosen the healthy food options that are available at the cafeteria. These policies will allow consumers and students to create a social proof heuristic that favours the healthy foods and healthier sizes.

Though group membership was not found to moderate the interaction between environmental cues and a participant’s choice, group membership needs to be understood in better detail, individuals seldom make food decisions on their own. Understanding how group dynamics and a desire to affiliate to a particular social group leads to certain actions; helpful or harmful, can aid in the creation of policies and programs that help improve the health of the population, while considering aspects such as culture and status which lead to the implicit formation of groups and subsequently social norms.

Managerial implications to consider, can be to use environmental cues that favour the choice of healthy versions or sizes of food. An example would be to have varying stacks of soda cups near the drink fountain. The stack of cups for the smaller cups should be shorter than that of the larger sizes, this will act as an environmental cue, in which consumers can infer that others
before them have chosen the smaller, and subsequently the healthier size to consume. This type of example can be extended to other containers such as having a smaller stack of containers that are used for the salad or vegetable options at a food establishment. These environmental cues will nudge consumers to making a healthier choice and create a social proof heuristic that favours healthier foods and sizes.

5.3 Limitations and Future Research

The limitations of this study need to be considered as a stepping stone for future research. Based on the limitations of this research, future research can be used to improve on the manipulations that were used in this study, the following are the limitations of the study followed by ways in which to improve future research. Due to the nature of social influence, and its influence on choices, as evidenced within this study, social influence coming from the presence of others must be controlled for. The current study had up to 10 participants at a time during a manipulation, the presence of others could have reduced the strength of the manipulation of Group Membership. Such that participants would consider the choice of the other participants in the study with them, and not consider the choice that was made by the fictitious previous participants.

Future studies should consider using only one participant at a time, to insure that participants are not being indirectly influenced by the presence of others. By running one participant at a time, Group Membership can be correctly manipulated, such that participants are led to believe that in fact a previous participant was from an in-group or out-group.
Secondly, a different classification for Group Membership should be considered, in order to insure that participants believed that in fact there were out-group members present before them. Through Berger and Heath’s (2008) work, the classification of undergraduate and graduate students was used in this study. Berger and Heath completed a pilot study that found that undergraduate students believed that graduate students were an out-group, but they did not dislike them. Though it was speculated that undergraduate students believed that graduate students were a dissimilar out-group, for the snack category this was not seen. The undergraduate students may have believed that graduate students are not quite so different in their taste preferences, and thusly their choices should not be so different from their own. The undergraduate students may have also wanted to be more like graduate students (i.e. With schooling level), which would thusly mean that they would like to act as they would, in order to accomplish this, they would model the choices of the graduate students. For future studies, a different set of in-group/out-group manipulation should be considered. Such as; nutrition major students, healthy eating advocates and/or elderly consumers. The differences between the two groups must be well known within the general study population, and there would be a clearly demarked out-group. Group Membership could also be further manipulated by using a similar method done in this study, by making participants write down similarities or differences to the target group.

The present study used a simple process by asking participants to write down three things that make them similar to the in-group or dissimilar to the out-group. This manipulation may not have been strong enough to create perceived differences between the two groups. A stronger manipulation for creating a perceived difference between the different group members should be
considered for future studies. In order to create stronger cognitive dissonance, the complete manipulation should be used, such that participants are told to write down three things that make them similar to the out-group or eight things that make them similar to the out-group (Oyserman & Fryberg, 2007). Participants who are in the many similarities condition will be more likely to believe that they are dissimilar to the outgroup, because of the level of difficulty in producing those similarities, and thusly will want to create distance between them and the out-group through their actions (Oyserman & Fryberg, 2007).

This study simply asked for a participant’s choice of chip and how many of each type of chip they would bring home if they were given the chance. Future studies can consider offering participants the chance to consume these food products. By using smaller portions of the food products, researchers can record how many of each product they consumed, thusly testing social influence in terms of food choice and intake. Within this type of study there would need to be further control of taste, which can be controlled by using vignettes that paint a picture of a very tasty and healthy food. This type of study will still focus on a consumer’s choice, but it will be backed up by an action of how many they choose to consume. This type of study will provide insight into if an initial choice can be translated into action, and how this process can be strengthened to create positive change in behavior, when it comes to healthy food choice and consumption.

5.4 Conclusion

The results of this study add support to social influence literature, as the main effect of social influence was supported. When participants were exposed to an environmental cue that denoted that others have chosen the healthy version of snack food, they were more likely to
choose the healthy version over the standard version than those in the environmental cue condition that denoted that previous participants had chosen the standard version. There was no support for the interaction effect hypothesis, but regardless of the previous participants group membership (i.e. in-group or out-group members) participants were influenced by the choice of previous participants. Future studies need to be conducted to verify the interaction effect of environmental cue and group membership. The findings of this study demonstrate that environmental cues can be used to influence a consumer’s choice of healthy foods regardless of group membership.
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doi:10.1016/j.jcps.2010.06.008

Nutritious or Delicious? The Effect of Descriptive Norm Information on Food
doi:10.1521/jscp.2010.29.2.228


APPENDICES

APPENDIX A

Pre-Study Methods – Mixed Berry Pomegranate Juice

ReFresh is a European company that has been relatively successful with their mixed berry fruit juice for the past several years. Their fruit juice is similar to typical fruit juices you find in the refrigerated section of Canadian grocery stores, such as Fruitopia and Five Alive. This product is just about to be launched in Canada. Furthermore, the company recently developed a new variant: Pomegranate mixed berry juice. Pomegranate is known to contain significant amounts of antioxidants, which help our body fight the damage created by free radicals. Although greater amount of antioxidant helps the body to better fight the damage created by free radicals, it makes the juice less tasty due to its associated bitter taste.

Figure A1: Information blurb for mixed berry pomegranate juice

Figure A2: Healthy vs. standard version of mixed berry juice. Mixed berry pomegranate juice (left) and standard mixed berry juice (right)
APPENDIX B

Pre-Study Methods - Avocado Brownie

Scrumptious Treats is an American company that has recently launched a new product in Ontario. The first product that they launched is a packaged brownie that is similar to the “two-bite” brownie found in the bakery goods section of the grocery store. In order to appeal to customers who are looking for healthy snack alternatives, Scrumptious Treats would like to introduce a new healthy alternative to their classic brownie. Unlike their conventional brownie which used canola oil, the new product uses avocado oil instead. Avocado oil is a healthy fat (monosaturated fatty acids) that aids in heart health. Avocado oil adds a creamy texture to the brownie but adds a distinct avocado flavour to the brownie, likened to a nutty flavour, which is liked by some but not liked by others.

Figure B1: Information blurb on avocado brownies

Figure B2: Healthy vs. standard version of brownies. Avocado brownie (left) and standard brownie (right).
Pre-Study Methods - Mixed Berry Juice Naturally Sweetened

Essentially Pleasant is an Eastern Canadian Company that has recently launched a new product in Ontario. The first product they launched is a mixed berry fruit juice that is similar to a Minute Maid Fruit Punch found at your local grocery store. Essentially Pleasant wants to change their products to include a natural sweetener instead of a fructose sweetener found in highly sweetened fruit juices. The natural sweetener that Essentially Pleasant is considering is Agave syrup, which is unrefined and free from additives. Agave syrup is a natural sweetener that is a healthy alternative to processed sugar but comes with a distinct flavour, which is liked by some but not liked by others.

**Figure C1: Information blurb for mixed berry juice with agave syrup.**

**Figure C2: Healthy vs. standard version of mixed berry juice. Mixed berry juice with agave syrup (left) and standard mixed berry juice (right).**
APPENDIX D

Pre-Study Methods - Mixed Berry Acai Juice

ReFresh is a European company that has been relatively successful with their mixed berry fruit juice for the past several years. Their fruit juice is similar to typical fruit juices you find in the refrigerated section of Canadian grocery stores, such as Fruitopia and Tropicana. This product is just about to be launched in Canada. Furthermore, the company recently developed a new variant: Acai mixed berry juice. Acai berry is known to contain significant amounts of antioxidants, which help our body fight the damage created by free radicals. Due to the presence of antioxidants, Acai berry juice may be associated with bitter taste.

Figure D1: Information blurb for mixed berry acai juice.

Figure D2: Healthy vs. standard version of mixed berry juice. Mixed berry acai juice (left) and standard mixed berry juice (right).
APPENDIX E

Pre-Study - Measures

The following are the full question set for each product pair. Response sets for perceived healthfulness, perceived taste and willingness to sample are the same across all product pairs. An example of the response set has been given for Mixed Berry Pomegranate Juice vs. Mixed Berry Fruit Juice. The number of products participants would bring home and calorie estimation was an open-ended question with no set response, therefore participants entered their own answer.

**Mixed Berry Pomegranate Juice vs. Mixed Berry Fruit Juice**

1. How much healthier do you believe this mixed berry pomegranate fruit juice (250mL) (containing antioxidants) is, in comparison to the standard mixed berry fruit juice (250mL)?
   a. Extremely less healthy
   b. Moderately less healthy
   c. Slightly less healthy
   d. No difference
   e. Slightly healthier
   f. Moderately healthier
   g. Extremely healthier

2. How much sweeter do you believe this mixed berry pomegranate fruit juice (250mL) (containing antioxidants) tastes in comparison to the standard mixed berry fruit juice (250mL)?
   a. Extremely less sweet
   b. Moderately less sweet
   c. Slightly less sweet
   d. No difference
   e. Slightly sweeter
   f. Moderately sweeter
   g. Extremely sweeter

3. How likely would you be to sample this pomegranate fruit juice (250mL) (containing antioxidants) in comparison to the standard mixed berry fruit juice (250mL)?
   a. Extremely unlikely
   b. Moderately unlikely
   c. Slightly unlikely
   d. Neither likely nor unlikely
e. Slightly likely
f. Moderately likely
g. Extremely likely

4. If you had the choice to bring 7 glasses (in total) of the juices presented to you in this survey home, how many of each type (mixed berry pomegranate fruit juice containing antioxidants and the standard mixed berry fruit juice) would you choose?

5. The conventional mixed berry juice (250mL) contains 130 calories, how many calories do you believe the mixed berry pomegranate fruit juice (250mL) (containing antioxidants) has?

\textit{Avocado Brownie vs. Brownie}

1. How much healthier do you believe this avocado brownie (35 grams) is, in comparison to the standard brownie (35 grams)?

2. How much sweeter do you believe this avocado brownie (35 grams) tastes, in comparison to the standard brownie (35 grams)?

3. How likely would you be to sample this avocado brownie (35 grams), in comparison to the standard brownie (35 grams)?

4. If you had the choice to bring 7 packages (in total) of the brownies presented to you in this survey home, how many of each type (avocado brownie and the standard brownie) would you choose.

5. The standard brownie (35 grams) contains 145 calories, how many calories do you think are in this avocado brownie (35 grams)?

\textit{Mixed Berry Fruit Juice (Sweetened with Agave Syrup) vs. Mixed Berry Fruit Juice}

1. How much healthier do you believe this fruit juice (250 mL) (sweetened with agave syrup) is, in comparison to a standard fruit juice (250mL) (sweetened with fructose)?

2. How much sweeter do you think this fruit juice (250 mL) (sweetened with agave syrup) is, in comparison to the standard fruit juice (250 mL) (sweetened with fructose)?

3. How likely would you be to sample this fruit juice (250 mL) (sweetened with agave syrup), in comparison to the standard fruit juice (250 mL) (sweetened with fructose) ?

4. If you had the choice to bring 7 glasses each (in total) of the juices presented to you in this survey home, how many of each type (fruit juice sweetened with agave syrup and the standard fruit juice sweetened with fructose) would you choose.

5. The conventional mixed berry juice (sweetened with fructose) (250mL) contains 130 calories, how many calories do you believe the mixed berry fruit juice (250mL) (sweetened with agave syrup) has?
**Kale Chips vs. Potato Chips**

1. How much healthier do you think these kale chips (35 grams) are, in comparison to these potato chips (35 grams)?
2. How much more savoury do you believe these kale chips (35 grams) are, in comparison to these potato chips (35 grams)?
3. How likely would you be to sample these kale chips (35 grams) in comparison to these potato chips (35 grams)?
4. If you had the choice to bring 7 bags (in total) of the chips presented to you in this survey home, how many of each type (Kale chips and the standard potato chip) would you choose?
5. The standard potato chips (35 grams) contains 170 calories, how many calories do you think are in these kale chips (35 grams)?

**Mixed Berry Acai Juice vs. Mixed Berry Juice**

1. How much healthier do you think this mixed berry acai fruit juice (250mL) (containing antioxidants) is, in comparison to the standard mixed berry fruit juice (250mL)?
2. How much sweeter do you think this mixed berry acai fruit juice (250mL) (containing antioxidants) tastes in comparison to the standard mixed berry fruit juice (250mL)?
3. How likely would you be to sample this mixed berry acai fruit juice (250mL) (containing antioxidants) in comparison to standard mixed berry fruit juice (250mL)?
4. If you had the choice to bring 7 glasses (in total) of the fruit juices presented to you in this survey home, how many of each type (mixed berry acai fruit juice containing antioxidants and the standard mixed berry fruit juice) would you choose?
5. The standard mixed berry fruit juice (250mL) contains 130 calories, how many calories do you think are in this mixed berry acai fruit juice (250mL) (containing antioxidants)?
APPENDIX F

Pre-study - Results

Table F1

Descriptive Statistics of All Products

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Deviation</th>
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<tbody>
<tr>
<td>Relative Healthfulness of Pomegranate Juice</td>
<td>5.28</td>
<td>1.008</td>
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<tr>
<td>Relative Sweetness Pomegranate Juice</td>
<td>3.21</td>
<td>1.301</td>
</tr>
<tr>
<td>Willingness to Sample Pomegranate Juice</td>
<td>5.60</td>
<td>1.530</td>
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<tr>
<td>No. of Pomegranate Juice Chosen</td>
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<td>1.624</td>
</tr>
<tr>
<td>No. of Standard Juice Chosen</td>
<td>2.56</td>
<td>1.623</td>
</tr>
<tr>
<td>Pomegranate Calories</td>
<td>134.53</td>
<td>59.998</td>
</tr>
<tr>
<td>Relative Healthfulness of Brownie</td>
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</tr>
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<td>Relative Sweetness of Brownie</td>
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<td>1.024</td>
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<td>No. of Avocado Brownie Chosen</td>
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<td>No. of Standard Brownie Chosen</td>
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<td>1.638</td>
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<td>Calories Brownie</td>
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<td>No. of Potato Chips</td>
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<td>Calories Acai</td>
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<td>23.596</td>
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Table F2

One – Sample T-tests

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<tr>
<th>Relative Healthfulness of Pomegranate Juice</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
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<tr>
<td>Relative Sweetness of Pomegranate Juice</td>
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<td>.000</td>
<td>1.279</td>
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<td>Relative Sweetness of Avocado Brownie</td>
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<td>.000</td>
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<td>.000</td>
<td>1.581</td>
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Table F3

Paired Sample T-tests

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<tr>
<th>Pair</th>
<th>Paired Differences</th>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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<tr>
<td>No. of Pomegranate Juice Chosen – No. of Standard Juice Chosen</td>
<td>1.930</td>
<td>3.240</td>
<td>.494</td>
<td>3.90</td>
<td>7</td>
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<td>No. of Avocado Brownie Chosen – No. of Standard Brownie Chosen</td>
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<td>3.275</td>
<td>.500</td>
<td>-</td>
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<td>No. of Agave Juice Chosen – No. of Standard Juice Chosen</td>
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<td>4.014</td>
<td>.612</td>
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<td>No. of Kale Chips Chosen – No. of Potato Chips Chosen</td>
<td>-2.581</td>
<td>3.534</td>
<td>.539</td>
<td>-</td>
<td>4.79</td>
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</table>
APPENDIX G

Main Study - Methods

Figure F1: Set up of the desk in main study
APPENDIX H

Main Study - Measures

The following are the demographic questions and manipulation check questions that were asked to each participant. Open-ended questions will not be followed by a fixed response set, questions with fixed response sets, will be illustrated.

1. What is your age?
2. What is your gender?
   a. Male
   b. Female
   c. Other
3. What year of study are you in?
4. What is your approximate weight? (in pounds)
5. What is your approximate height? (in feet and inches)
6. What is your cubicle number?
7. What do you think the aim of the study was?
8. Did you notice the wrapper left behind by previous participants?
   a. Yes
   b. I Did not Notice
   c. No
9. What did the previous participants choose?
10. Would you say that the snack choice of previous participants influenced your own decision?
    a. Strongly Agree
    b. Moderately Agree
    c. Slightly Agree
    d. Neither Agree no Disagree
    e. Slightly Disagree
    f. Moderately Disagree
    g. Strongly Disagree
11. Why were you or why were you not influenced by the snack choice of previous participants?
APPENDIX I

Main Study Results – Normality Tests

The following is the normality test and histogram of the Main study data transformed into square root.

Table I1

Normality Test of No. of Kale Chips (sqrt)

<table>
<thead>
<tr>
<th>Tests of Normality</th>
<th>Kolmogorov-Smirnov(^a)</th>
<th>Shapiro-Wilk</th>
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<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>df</td>
</tr>
<tr>
<td>No. of Kale Chips Chosen (sqrt)</td>
<td>.235</td>
<td>116</td>
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</table>

![Figure I2: Histogram of No. of Kale Chips Chosen (sqrt)](image)

**Figure I2: Histogram of No. of Kale Chips Chosen (sqrt)**
## APPENDIX J

Main Study - Correlations Table

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Environmental Cue</th>
<th>Group Membership</th>
<th>Binary Choice</th>
<th>No. of Kale Chips Chosen</th>
<th>Age</th>
<th>Gender</th>
<th>Year of Study</th>
<th>Weight (lbs)</th>
<th>Perception of Influence</th>
<th>Start Time</th>
<th>Height (ft, in)</th>
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<tr>
<td>Environmental Cue</td>
<td>1</td>
<td>-.087</td>
<td>.214*</td>
<td>.177</td>
<td>.031</td>
<td>.040</td>
<td>-.060</td>
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<td>-.141</td>
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<td>.037</td>
<td>-.034</td>
<td>-.030</td>
<td>-.156</td>
<td>.006</td>
<td>.071</td>
<td>-.648**</td>
<td>.110</td>
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<td>.020</td>
<td>1</td>
<td>.673**</td>
<td>.230*</td>
<td>.101</td>
<td>.115</td>
<td>.002</td>
<td>-.213*</td>
<td>-.059</td>
<td>-.092</td>
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<td>.037</td>
<td>.673**</td>
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<td>.258**</td>
<td>.260**</td>
<td>.222*</td>
<td>-.062</td>
<td>-.219*</td>
<td>-.064</td>
<td>-.143</td>
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<td>-.034</td>
<td>.230*</td>
<td>.258**</td>
<td>1</td>
<td>.083</td>
<td>.747**</td>
<td>.147</td>
<td>-.189*</td>
<td>.017</td>
<td>-.096</td>
</tr>
<tr>
<td>Gender</td>
<td>.040</td>
<td>-.030</td>
<td>.101</td>
<td>.260**</td>
<td>.083</td>
<td>1</td>
<td>.109</td>
<td>-.466**</td>
<td>-.240**</td>
<td>.033</td>
<td>-.582**</td>
</tr>
<tr>
<td>Year of Study</td>
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<td>-.156</td>
<td>.115</td>
<td>.222*</td>
<td>.747**</td>
<td>.109</td>
<td>1</td>
<td>.123</td>
<td>-.225*</td>
<td>.128</td>
<td>-.038</td>
</tr>
<tr>
<td>Weight (lbs)</td>
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<td>.006</td>
<td>.002</td>
<td>-.062</td>
<td>.147</td>
<td>-.466**</td>
<td>.123</td>
<td>1</td>
<td>.104</td>
<td>.082</td>
<td>.615**</td>
</tr>
<tr>
<td>Perception of Influence</td>
<td>.000</td>
<td>.071</td>
<td>-.213*</td>
<td>-.219*</td>
<td>-.189*</td>
<td>-.240**</td>
<td>-.225*</td>
<td>.104</td>
<td>1</td>
<td>-.142</td>
<td>.132</td>
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<td>Start Time</td>
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<td>-.648**</td>
<td>-.059</td>
<td>-.064</td>
<td>.017</td>
<td>.033</td>
<td>.128</td>
<td>.082</td>
<td>-.142</td>
<td>1</td>
<td>-.074</td>
</tr>
<tr>
<td>Height (ft, in)</td>
<td>-.141</td>
<td>.110</td>
<td>-.092</td>
<td>-.143</td>
<td>-.096</td>
<td>-.582**</td>
<td>-.038</td>
<td>.615**</td>
<td>.132</td>
<td>-.074</td>
<td>1</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).
APPENDIX K

Main Study – Regression Analysis

Table K1

Classification Table for Block 0. Regression Model without Explanatory Variables

<table>
<thead>
<tr>
<th>Observed Binary Choice</th>
<th>Predicted Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potato</td>
<td>66</td>
</tr>
<tr>
<td>Kale</td>
<td>50</td>
</tr>
</tbody>
</table>

Overall Percentage 56.9

a. Constant is included in the model.

b. The cut value is .500

Table K2

Variables in the Equation Table for Block 0. Regression Model without Explanatory Variables

<table>
<thead>
<tr>
<th>Variables in the Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
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</tr>
<tr>
<td>Step 0</td>
</tr>
</tbody>
</table>

Table K3

Model Summary for Block 1. Regression Model with Explanatory Variables

<table>
<thead>
<tr>
<th>Model Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step</td>
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<tr>
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</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.
## APPENDIX L

Main Study – ANOVA Analysis

### Pairwise Comparisons

<table>
<thead>
<tr>
<th>Healthfulness Cue</th>
<th>Group Membership</th>
<th>Group Membership</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.(a)</th>
<th>95% Confidence Interval for Difference(a)</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhealthy</td>
<td>In-group</td>
<td>Out-group</td>
<td>-.436</td>
<td>.477</td>
<td>.362</td>
<td>-1.381 to .509</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Out-group</td>
<td>In-group</td>
<td>.436</td>
<td>.477</td>
<td>.362</td>
<td>-.509 to 1.381</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthy</td>
<td>In-group</td>
<td>Out-group</td>
<td>.040</td>
<td>.459</td>
<td>.930</td>
<td>-.869 to .950</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Out-group</td>
<td>In-group</td>
<td>-.040</td>
<td>.459</td>
<td>.930</td>
<td>-.950 to .869</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on estimated marginal means

*a. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).*

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141