Craving Comfort – The Emotional Foundation of Unhealthy and Unplanned Purchases

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Abstract

Can emotions influence what will end up in one's shopping basket? This study focused on how emotions influence food purchasing behaviour of university students aged between 16 to 26, investigating the research question "*To what extent does negative affect predict an increase in impulsive and unhealthy food purchases?*". Besides, the study investigated the feasibility of the photo diary and experience sampling method (ESM) for this type of study. The data collection was carried out via the TIIM app, where participants needed to complete three phases: a baseline questionnaire, the ESM phase and a follow-up questionnaire. During the ESM phase, participants were prompted five times per day throughout one week to report their food purchases and corresponding mood, measured by the Momentary Affect Scale (MAS). Descriptive statistics indicated that participants while being under negative emotions, tended to purchase more unhealthy food and make more unplanned purchases. Participant entries from the follow-up questionnaire revealed that they noticed that they were trying to cope with stress through purchasing unhealthy food, and that this often caused their purchases to be unplanned. Having the findings of this research in mind, future research can focus on further exploring how other stressful environments have an influence on purchasing behaviour and how people can be supported to cope with negative emotions.

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Introduction

Eating behaviour is influenced by various psychological, physiological and situational factors (Köster & Mojet, 2015). Although eating behaviour is controlled by biological needs, emotional factors often have an important influence on shaping what individuals consume. For instance, one psychological factor that strongly influences eating behaviour is emotional eating, which refers to the tendency to consume food in response to emotions rather than the instinct of physical hunger. It is especially linked to negative emotions such as stress, anxiety, or sadness, increasing the probability that individuals may turn to high-calorie, comfort foods, which are often rich in carbohydrates and fats (Evers et al., 2018). Although emotional eating is frequently associated with negative emotions, positive emotions may also shape eating patterns by reinforcing healthier and goal-directed choices (Evers et al., 2018). While eating behaviour relates to the patterns and motivations underlying food consumption, food purchasing behaviour refers to the decisions and actions involved in acquiring food (Gurbuz & Macabangin, 2019). These behaviours are closely linked, as purchasing behaviour often precedes and shapes what is finally consumed. In this regard, can emotions influence what will end up in one's shopping basket?

In this study, it is important to distinguish between mood and emotion because these terms often overlap. According to Lochner (2016), emotions usually have a stimulus event, are short, intense and have biological implications. In contrast, mood consists of rather global, undirected and mostly unconscious background sensations that are more stable than emotions. Regarding this overlap between mood and emotions, this study focuses on the broader concept of affect, which refers to the experience of feeling or emotion, since it encompasses both terms and will allow a more comprehensive analysis.

Literature Review

The following section will discuss theoretical frameworks that might explain the link between negative affect states, food purchasing and consuming behaviour. According to the Affect Regulation Hypothesis, individuals look for behaviours, like eating, shopping, or socialising, to regulate their affective state and reduce distress (Macht, 2008; Gardner & Hill, 1987). On this basis, people tend to eat comfort food as a coping mechanism because these kinds of foods provide a temporary relief through their pleasurable taste and affect-enhancing effects. Typically, those foods are high in carbohydrates and fat because such foods stimulate the release of insulin and endorphins, resulting in a temporary affect enhancement (Evers et al., 2018; Gardner & Hill, 1987). In this regard, individuals who experience sadness, anxiety, or stress are more likely to purchase indulgent and less nutritious foods for the achievement of this temporary emotional relief.

Moreover, the Restraint Theory further explains how certain individuals, particularly those actively restricting their diet, may struggle with self-control when experiencing negative affect. According to Brytek-Matera et al. (2021) the Restraint Theory suggests that eating behaviour is under cognitive control, which refers to the mental processes that allow us to consciously manage our thoughts, affect, and behaviours in accord with internally represented intentions or goals (Cohen, 2005). In this context, restrictive dieting often leads to reduced sensitivity to internal cues for satiety, resulting in excessive intake of food when cognitive control is impaired. In other words, individuals who typically avoid high-calorie foods may become more vulnerable to emotional eating episodes during periods of stress, anxiety, or sadness, often resulting in even excessive consumption of unhealthy and unplanned food purchases (Macht, 2008).

Furthermore, the Temporal Construal Theory is another theoretical framework that might serve as an explanation of how affect influences purchasing decisions. This theory describes the effects of psychological distance on thinking, decision making and behaviour

(Baumeister & Vohs, 2007), meaning that individuals perceive and evaluate future events differently depending on how temporally distant these events are. In this regard, distant-future events are perceived in abstract and high-level thinking, focusing on long-term goals, such as maintaining a healthy diet. On the other hand, near-future events are perceived in concrete, low-level thinking, prioritising short-term outcomes such as immediate rewards. In connection with consumer behaviour, negative affect often increases the desire for immediate mood repair, possibly causing a shift in attention away from the long-term goal, such as a healthy diet, toward a short-term goal, such as purchasing indulgent and unhealthy food for temporary mood enhancement. This aligns with the findings of Gardner & Hill (1987), who found that individuals experiencing negative affect are more likely to focus on immediate satisfaction rather than long-term goals, resulting in the prioritisation of short-term emotional relief, leading to impulsive and unhealthy food purchases.

Additionally, the concept of reduced self-regulation further explains this tendency. Negative affect can impair cognitive control, which refers to the mental processes that allow us to consciously manage our thoughts, affect, and behaviours in accord with internally represented intentions or goals (Cohen, 2005). This makes individuals more inclined to impulsive purchases and less capable of making thoughtful and planned decisions (Macht, 2008). For instance, appealing factors such as promotions, discounts, and strategically placed snack displays near checkout counters make it challenging for people who are searching for comfort and distraction to resist these tempting stimuli, encouraging impulsive buying (Köster & Mojet, 2015). Besides, the role of information is also important in shaping emotional responses to food. Research shows that retailers actively manipulate the buyers' emotional responses through product labelling or health claims to influence consumer choices (Ismael & Ploeger, 2020). Since sustainable choices are often linked to affect (Pšurný et al., 2024), it can be suggested that when campaigns highlight a product's sustainability or health benefits, it can appeal to people under a positive affect state. Conversely, when marketing strategies

relied more on visual appeal, this might be more appealing to consumers under negative affect, reinforcing less healthy and indulgent purchases In this regard, people with positive affect better process textual information, while people with negative affect do so with visual information.

To summarise, affect is important in shaping decision-making processes, particularly in food purchasing behaviour. According to prior research, positive affect often supports goal-directed decisions, where individuals tend to make thoughtful and health-conscious choices. In contrast, individuals experiencing negative affect tend to make impulsive food choices, opting for items that provide immediate satisfaction rather than align with long-term goals (Macht, 2008; Pšurný et al., 2024). Exploring and better understanding how affect influences purchasing behaviour can help develop interventions that can help society to become more aware of this influence and how to cope with it.

Identifying the Research Gap and Rationale for this Study

While prior research has explored the link between mood and food purchasing, much of this work has been conducted in controlled, laboratory settings. These environments often fail to capture the complexities of real-life decision-making, where external triggers such as social contexts, marketing tactics, or time pressure may play a significant role (Hill et al., 2022). In particular, there is limited research on how mood states influence food purchasing behaviour in everyday settings. Since impulsive and unplanned purchases are common in everyday life, investigating these patterns outside the lab is important. This study addresses this gap by combining the Experience Sampling Method (ESM) and photo diary method to capture real-life affect-driven food purchasing behaviour. These approaches allow further insight into the relationship between mood and food purchasing behaviour. In connection with this, this study also aims to investigate the feasibility of using the photo diary method in an ESM study like this one.

Experience Sampling Method. The ESM is a research technique that typically involves using smartphone apps to send multiple short questionnaires distributed throughout the day to collect data on affect, decisions, and situations that individuals experience in everyday life (Bauer et al., 2022). These prompts catch participants in the moment to report their current behaviour, reducing recall bias, since participants are answering right away, preventing event occurrences from becoming clouded by memory. This capturing of moment-to-moment variations makes studying dynamic processes like affect fluctuations, decision-making, or behaviour patterns across different contexts more beneficial. ESM provides ecologically valid data and allows for exploring how situational and affective states influence outcomes such as food purchasing-/ consuming behaviour (Stijovic et al., 2025; Liao et al., 2018).

Photo Diary Method. The Photo Diary Method is one form of a visual diary commonly used as a qualitative data collection technique. This method offers a participant-led perspective, allowing participants to report their daily activities, experiences, or behaviours through photographs, often accompanied by brief written or verbal descriptions (Margolis & Pauwels, 2011). This way, researchers are able to gain more insight into real-life contexts and the personal meaning of behaviours.

Combining ESM and the photo diary method allows for capturing situational, real-world data that traditional self-report methods may overlook. By gathering real-time data on affect alongside photographic evidence, this approach enables the identification of both conscious and subconscious influences on affect-driven purchasing behaviour. In this regard, this study's findings may contribute to improving strategies that promote healthier purchasing habits and help consumers become more aware of their affect-driven decisions.

Research Question and Hypotheses

This research aims to provide insights into how affect influences purchasing behaviour in everyday life, which could be used to inform strategies to promote healthier consumer choices. Keeping the literature mentioned above and the research's aim in mind, the current study proposes the following research question and hypotheses:

RQ: To what extent does negative affect predict whether individuals make more impulsive and unhealthy food purchases, compared to positive affect?

H1: Individuals under negative affect will purchase more unplanned food items than being under positive affect.

H2: Consumers experiencing negative affect will buy more unhealthy foods than healthier options, compared to consumers experiencing positive affect.

Methods

Study Design

The study design used a qualitative experienced sampling design to investigate the influence of negative affect on individuals' purchasing behaviour in everyday life. The study entails three steps of data collection: the baseline questionnaire, the ESM phase and the follow-up questionnaire, which started on the 7th of April and ended on the 7th of May. Participants were asked to upload photos of their food purchases. They received five prompts per day throughout seven days to not only collect the visual data but also asked the participants to report their affect state and what influenced them to purchase the submitted food item. To complement the ESM data, participants were asked to complete a baseline and follow-up questionnaire for a deeper reflection and to help contextualise the data. The ethical

approval was obtained from the Faculty of Behaviour, Management, and Social Sciences of the University of Twente (250497).

Participants

The target group were university students aged 16 to 26. To be able to participate in the study, the participants needed to be responsible for their food purchases and not rely on other people, have a functioning phone and camera, and have an available WIFI connection or mobile data, such as 5G. By the end of the study, participants had to have all three phases of the data collection completed and include a minimum of two purchases, otherwise, their data was excluded due to insufficiency. Participants were recruited through a combination of convenience, snowball and volunteer sampling. Initially, convenience sampling was used by inviting participants through personal and academic networks. In addition, the study was made available on the University of Twente's SONA system, allowing students to voluntarily sign up in exchange for course credit, reflecting the volunteer sampling approach. Lastly, participants were encouraged to share the study with their peers, which is a characteristic of snowball sampling, to increase the reach of the sample.

In total, 17 participants were invited to participate in this study. Out of this sample, three participants were excluded due to insufficient data reported, with the minimum requirement being two purchases during the seven-day period. Some data loss occurred due to technical issues with the TIIM app, such as difficulties uploading photos and saving progress, resulting in excluding 7 further participants because of insufficient data. The final data set included 7 out of 17 participants. The sample consisted of 4 females (M_{age} = 21.00, SD = 2.16) and 3 males (M_{age} = 23.00, SD = 3.46), with a mean age of 21.86 years (SD = 2.73). Five participants reported being German, and two reported being Dutch.

Materials

The study consisted of several materials to collect and assess data on affect and food

purchasing behaviour. The Qualtrics platform was used to obtain the participants' informed consent (see Appendix A). The Twente Intervention and Interaction Machine, referred to as TIIM, was developed and maintained by the BMS lab of the University of Twente. This platform was used to deliver experience sampling prompts and collect real-time responses. The app included three parts: the baseline questionnaire, the ESM phase and the follow-up questionnaire.

Baseline Questionnaire. The baseline questionnaire was supposed to gather background information on participants' demographic information, general eating habits, food purchasing behaviours and emotional tendencies, before the start of the ESM phase. The questionnaire encompassed five parts, out of which the first four were self-developed (see Appendix B):

Demographics. The demographics section included three items to gather background information about the participants. These items focused on identifying the participants' age, gender, and nationality. This information was collected for descriptive purposes.

Eating Habits. This section assessed general dietary patterns and emotional eating tendencies and consisted of five items. Participants reported on a Likert scale on meal regularity (1 = Never, 4 = Always), for instance, how often they eat breakfast, lunch, dinner. Next, there was one item on snacking frequency (1 = Never/ Rarely, 4 = Daily). Lastly, there were three items on how negative emotional states influence the participants' eating behaviour. The first item was assessed through a Likert scale, if participants perceived any change in eating behaviour during negative affect (0 = no change, 1 = tends to eat less, 2 = tends to eat more). From there, there were two items related to how frequently participants consumed comfort food and healthy options (1 = Never, 5 = Always) in response to negative affect.

Shopping Habits. This part included six items, to assess on a Likert scale the participants' frequency of grocery shopping (1 = Never/ Rarely, 4 = Very Frequently), use of shopping lists

(1 = Never/Rarely, 4 = Always), impulsive purchasing (1 = Never, 5 = Always), and food ordering behaviour, such as delivery or takeout (1 = Rarely, 4 = Daily) to assess participants' typical food purchasing behaviour. Influencing factors behind impulsive buying were explored using a multiple-response checklist, including affect, cravings, promotions, and social factors.

PANAS-SF. The PANAS-SF (Positive and Negative Affect Schedule – Short Form) assessed participants' general emotional disposition before the study. This questionnaire consists of 20 items: 10 measuring positive affect (e.g., interested, enthusiastic) and 10 measuring negative affect (e.g., upset, nervous). Participants rated how they generally feel using a 5-point Likert scale ranging from (1) "Very slightly or not at all" to (5) "Extremely". The scores were calculated by summing up the 10 items for each subscale, positive and negative affect, resulting in scores ranging from 10-50. Higher scores indicate greater sensitivity of the corresponding affective state. Its psychometric properties indicated high reliability with a Cronbach's alpha of .99 for PA, and .87 for NA (Watson et al., 1988).

ESM Phase. The ESM prompts were developed specifically for this study (see Appendix C). They were developed to capture participants' momentary emotional states and food purchasing behaviour in their natural environment. This phase allowed the gathering of ecologically valid data by capturing experiences in the moment.

Photo Diary Method. This method aimed to capture real-time data on participants' food purchasing behaviour. It involved prompting participants to report and document recent food purchases by uploading a photo. The photos were required to display the product's front label and, if available, its nutritional information, to enable accurate analysis of food choices and labelling exposure.

Affect Measurement. Participants' affect and arousal levels were assessed using the Momentary Affect Scale developed by Thayer (1989). The scale includes two subscales:

positive affect (Cronbach's alpha (α) = .86) and negative affect (Cronbach's alpha (α) = .91)

as reported by Mor et al. (2010). This scale measures two dimensions of arousal: Tense

Arousal (e.g., nervous, anxious vs. calm, relaxed) and Energetic Arousal (e.g., alert, energetic

vs. tired, sluggish). These were assessed on a Visual Analogue Scale (VAS) ranging from 1 to

10, with 5 representing a neutral state. Participants rated how they felt before making a food

purchase using two Likert-scale items: Valence (1 = Very Negative to 10 = Very Positive) and

Arousal (1 = Very Calm/Low Energy to 10 = Very Intense/High Energy)

Purchasing Behaviour and Context. This component was designed explicitly for this

study and was supposed to assess purchase intentionality and factors underlying participants'

food purchasing decisions. One item was used to assess the participants' potential impulsive

decisions (Was the purchase planned? Yes/No). The following item involved a predefined list

of potential influences, such as Mood/Emotions, Cravings, Promotions or Discounts, and

Social Influence.

Follow-Up Questionnaire. The follow-up questionnaire consisted of six items and

was developed to collect participants' self-perceived patterns and reflections on their affect

and food purchasing behaviour during the experience sampling period (see Appendix D). The

aim was to gain qualitative and descriptive insight into how participants experienced the

connection between their affective states and food-related decisions.

The questionnaire consisted of both closed- and open-ended questions. One item was

related to whether there was a connection between the affect and food-related behaviour, with

a follow-up open-ended item to describe this connection if applicable. Two multiple-choice

items assessed behavioural tendencies when experiencing negative affect, such as purchasing

impulsively or unplanned, choosing high-fat comfort foods (e.g., pizza, burgers), consuming

high-sugar items (e.g., candy, chocolate), opting for salty snacks or healthier alternatives. One

item was intended to assess whether participants noticed being more intentional in their food

choices when experiencing positive affect (e.g., selecting healthier or goal-aligned options). In addition, there was an item about whether the study increased the participants' awareness of the influence of affect on food-related behaviour, with an open-ended prompt to elaborate on insights gained.

Procedure

In total, the data collection took 4 weeks. After the participants had signed up for the study, they were informed via Qualtrics with the informed consent form. After they had read and agreed to the consent form, they were sent an email with the researchers' contact information so that the participants would be able to contact them in case of upcoming questions or concerns together with a step-by-step guide with instructions on how to proceed: First, they were instructed on how to download the TIIM app and where to download it, such as on Google Play Store or Apple App Store. Afterwards, they had to register with their email and were allowed to create a nickname instead of indicating their real name to ensure anonymity.

After the registration, the App asked the participants to enter a study code that the researchers provided via email to access the study. After the participants had undergone each step listed in the email, they could start with the study. First, they began with the baseline questionnaire that took approximately 8–12 minutes to complete. Then, they continued with the ESM phase, which started shortly after the completion of the baseline questionnaire. There, the participants received a series of short prompts delivered five times during the day from 9:00 to 19:00 in 2-hour intervals over the study period. If the participant indicated having made a purchase, they were asked to upload a photo of the purchase and the nutritional label, if given, followed by answering some questions about their current emotion and motivation behind their purchase. Filling out a prompt took approximately 1-2 minutes. If, on the other hand, the participant had responded to the prompt with 'no', the prompt would stop at that stage, and the participants did not need to indicate anything. During the ESM phase,

there were some technical issues with TIIM, such as difficulties uploading photos and saving

progress. To minimise data loss, participants were asked to submit data through alternative

methods such as email or WhatsApp. After one week, the ESM phase was completed, and the

participants were asked to complete a follow-up questionnaire, which took approximately 10-

15 minutes, to help them reflect on their experiences during the study and gain more details.

Data Analysis

The data collected via the TIIM app was exported into Excel for cleaning and

organisational purposes. Based on participant submissions via WhatsApp or email, including

time, date, and pseudonym, missing or failed uploads were manually added. Two datasets

were used: one containing participant information gained by the baseline questionnaire, and

another containing event-level data from ESM data and photo diaries. There was no data set

for the follow-up questionnaire, because only a few participants provided detailed responses.

Due to the limited data, formal coding was not feasible, so the few statements were evaluated

descriptively for some contexts. Both datasets were cleaned and structured manually to ensure

consistency. When participants submitted less than two prompts or missed the follow-up

questionnaire, they were excluded because of insufficient data. To analyse the affective states,

they were categorised into four categories: "*Content*", "*Positive Activated*", "*Negative

Deactivated*", and "*Negative Activated*", based on tension and energy dimensions (see Table

1). This categorisation was adapted from the Circumplex Model of Affect (Russell, 1980;

Watson & Tellegen, 1985), which organises emotions along the axes of positive–negative

valence and high–low arousal. Food purchases were coded into the main categories

"*Healthy*", "*Unhealthy*", and "*Mixed*", with subcategories "*Fruit*", "*Vegetable*", "*Whole

Grain*" and "*Protein*" for healthy food and "*High Fat*", "*High Sugar*", "*High Carb*" and

"*Salty Snack*" for unhealthy food. The categories were informed by nutritional content,

common classification standards, and information adopted from Liao et al. (2018), because

they had a similar study (see Table 2). Examples of how certain purchases were categorised are displayed in Figure 1.

Table 1

Affective State Categorisation

Affective State	Tension Level	Energy Level	Description
Content	Low Tension	Low Energy	Feels relaxed, at ease, low arousal. Often associated with quiet satisfaction.
Positive Activated	Low Tension	High Energy	Feels good, energised, and motivated. A 'ready to go' emotional state.
Negative Deactivated	High Tension	Low Energy	Feels down, sluggish, or overwhelmed. Often linked with sadness or fatigue.
Negative Activated	High Tension	High Energy	Feels anxious, tense, and alert.

			Linked to stressful or pressured situations.

Table 2

Categorisation of Food Purchases

Main Category	Subcategory	Example Items	Rationale
Healthy	Fruit	Apple, Banana, Berries	Low-calorie, nutrient-rich
	Vegetable	Carrot, Cucumber, Broccoli	Rich in fibre and micronutrients
	Whole Grain	Whole grain bread, Oatmeal	Complex carbohydrates, slow energy release
	Protein	Chicken breast, Eggs, Beans*	High protein, low saturated fat
Unhealthy	High Fat	Croissant, Sausage, Cheesebun	High in saturated fat and calories
	High Sugar	Chocolate, Gummy bears	Contains high added sugars
	High Carb	Ramen, White bread	Refined carbohydrates, low

			fiber
	Salty Snack	Chips, Salted peanuts	High sodium and fat content
Mixed	—	Meal deals, Falafel wrap	Includes both healthy and unhealthy components

Note. Beans were categorised under Protein due to their plant-based protein content and low-fat profile.

Figure 1

Examples of Food Purchases Categorised as Healthy, Unhealthy and Mixed

A   B   C

Note. (A) Healthy purchase – Fruit (grapes and berries). (B) Unhealthy purchase – High sugar (Coke) and high fat (fries). (C) Mixed purchase – Falafels (includes both healthy and unhealthy elements).

For the data analysis, the program R Studio was used. Analyses were primarily descriptive, as the sample size (n = 7) did not permit inferential statistical testing. Descriptive statistics were computed to summarise the baseline questionnaire to get an overview of the sample. For the ESM data, the focus was first on summarising participants' food purchases over the one week and their corresponding affective states and self-reported purchase influences, according to which descriptives were calculated to find out the data compliance of the participants, then how many purchases were made in total and how many of these fell into the categories "*Healthy*", "*Unhealthy*" and "*Mixed*". After that, descriptives were calculated to compare how many healthy or unhealthy items were purchased by affect group. Furthermore, the frequencies of the food subcategories (e.g. "*Fruit*", "*Vegetable*", "*HighFat*", "*HighSugar*") were compared by affect group to investigate what was purchased the most. Then, the tendency towards impulsive purchases was investigated by comparing the planned and unplanned purchases by affect group. Lastly, the frequency of the self-reported factors

that might have influenced the purchasing behaviour of the participant was compared, together with the planning status of each of these factors, to investigate an impulsive purchasing tendency.

Follow-up questionnaire data was used to assess participants' subjective experience, self-perceived patterns and reflections on their mood and food purchasing behaviour during the ESM period. It included whether mood influenced purchasing behaviour, noticed patterns such as tendencies for unplanned purchases or purchasing specific food groups and awareness of how affect influences purchasing behaviour. This context was compared to the ESM behaviour patterns to compare whether the perceived behaviour aligns with observed behaviours in terms of direction of mood and purchase patterns or frequency match of specific patterns. For instance, if participants have reported using unhealthy food to cope with negative affect, this data was compared to see if there was an increase in unhealthy purchases under negative affect in the ESM data. Overall, this study was more exploratory because of the small sample size.

Results

Baseline Questionnaire: Overview of the Sample

Descriptive statistics from the baseline questionnaire are displayed in Table 3. These statistics provide an overview of the sample. The following sections are about the observations on the participants' self-reported eating and shopping behaviours.

Eating Habits (Meal Regularity & Snacking): All seven participants reported that they often have regular meals. Most participants (N=5) indicated that they snack often (4-6 times per week). One reported daily snacking and one reported to snack occasionally (1-3 per week).

Mood and Food Choices. Regarding emotional eating, most participants (N = 5/7) indicated a tendency to eat more when experiencing negative emotions, one reported a tendency to eat less, and one reported no change in eating behaviour. The mean for emotional eating tendency is 1.57, which is on a higher end, indicating a general tendency towards increased eating when experiencing negative emotions. Regarding the comfort food consumption, most participants (N = 4) reported consuming comfort food often, with an average value of 2.57 (SD = 0.53). The consumption of healthy food varied more widely across the sample, with a lower mean of 1.57 (SD = 1.13), indicating less frequent healthy eating habits.

Grocery Shopping Habits and Convenience Eating. In terms of grocery shopping habits, most participants (N = 4) reported grocery shopping 1 – 2 times per week, two participants reported going 3 times per week or more, and one participant reported going grocery shopping 1 – 2 times per month, with an average value of 3.14. The use of a shopping list ranged from occasionally to always, with a mean of 2.71 (SD = 0.69), indicating that most participants use a shopping list regularly. The average value for impulsive purchases is 2.57 (SD = 0.79), which is on the higher end, indicating that impulsive buying happens very often. Most participants reported ordering takeout monthly (M= 2.00, SD = 0.81). Participants were required to report the factors that most influenced their unplanned purchases. As illustrated in Figure 2, "*Craving*" was the most frequently reported factor, followed by "*Convenience*" and "*Affect*". "*Social Influence*" and "*Discount*" are the less frequently reported factors.

Table 3

Descriptive Statistics on the Participants' Self-Reported Eating and Shopping Behaviours

Variable	Mean	SD	Min	Max
Regular Meals	3.00	.00	3.00	3.00
Snacking	3.00	.58	2.00	4.00
Eats When Negative	1.57	.79	.00	2.00
Comfort Food	2.57	.53	2.00	3.00
Healthy Food	1.57	1.13	1.00	4.00
Grocery Frequency	3.14	.69	2.00	4.00
Shopping List	2.71	.76	2.00	4.00
Impulsive Purchases	2.57	.79	1.00	3.00
Orders Takeout	2.00	.81	1.00	3.00

Figure 2

Self-Reported Influences on Impulsive Buying
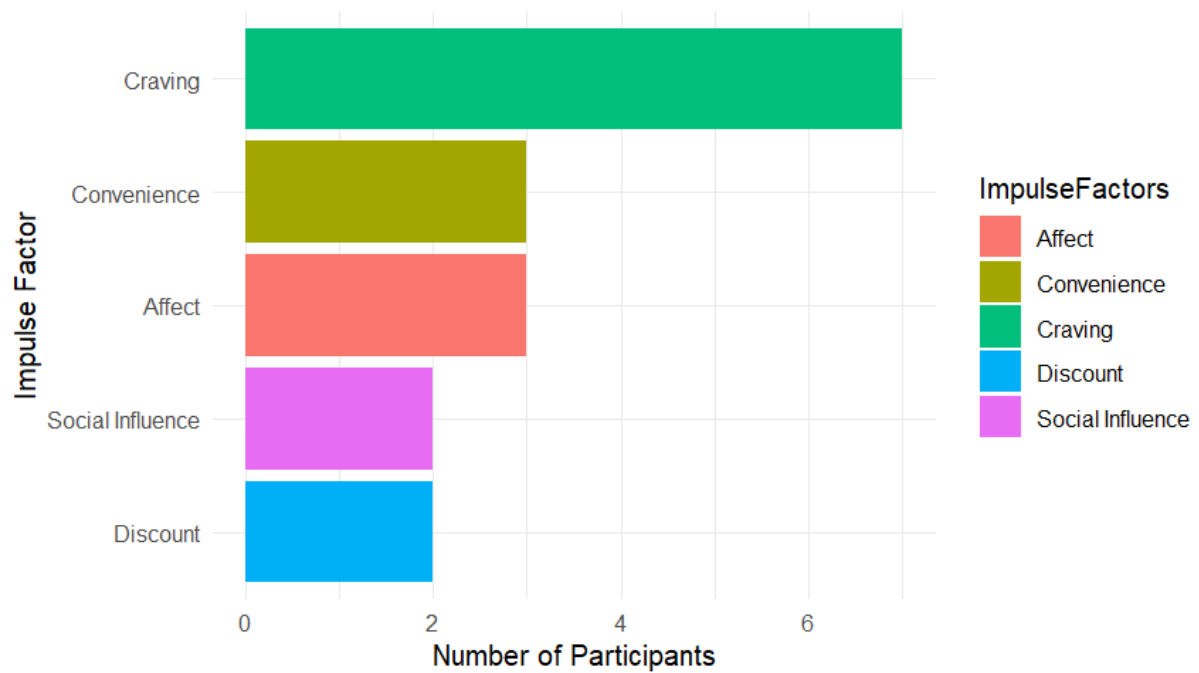
At the end of the baseline questionnaire, the PANAS-SF scores of the participants were measured to find their general affective state over the past week, providing scores for positive and negative affect. Participants reported a moderate level of positive affect (M = 30.00, SD = 6.27), with scores ranging from 20 to 39. Negative affect was generally lower (M = 21.71, SD = 6.90), ranging from 14 to 33, suggesting that the sample tended to experience more positive than negative emotional states at baseline.

ESM Phase

Data Compliance. Table 4 shows the participants' compliance during the ESM-phase. A total of 245 ESM prompts were sent throughout the study. 18.78% of prompts were answered with "*Yes*", 26.53% of prompts were answered with "*No*", and 54.69% remained unanswered.

Table 4

Participant Engagement during ESM Phase

Participant	Answered	Not Answered	Total Number of Prompts
1	5	25	35
2	13	4	35
3	6	26	35
4	5	3	35
5	4	1	35
6	10	1	35
7	3	5	35

Affect-Related Trends in Healthy and Unhealthy Purchases. Participants submitted a total of 64 food purchases, including 33 unhealthy purchases (51.6%), 24 healthy purchases (37.5%), and 7 mixed purchases (10.9%), with unhealthy items being the most frequent. Across all recorded purchase moments, participants most frequently reported feeling Positive Activated (37.5%), followed by Content (32.81%), Negative Activated (15.63%) and Negative Deactivated (14.08%). To examine the relationship between affective state and item choice, each purchase was categorised as Healthy, Unhealthy, or Mixed. Due to the high difference in the number of purchases by affect group, the focus was on the proportions within each affect group and not on the frequencies, to avoid misleading conclusions. The highest proportion of unhealthy purchases occurred during Negative Deactivated states (66.7%), followed by Content (57.1%) and Positive Activated (45.8%). Meanwhile, the highest proportion of healthy choices occurred during Negative Activated states (50%), though the overall number of observations in this category was small. These findings are visually

summarised in Figure 3, which presents a stacked bar chart of purchase types across affect categories.

Figure 3

Purchases by Affect and Health Category
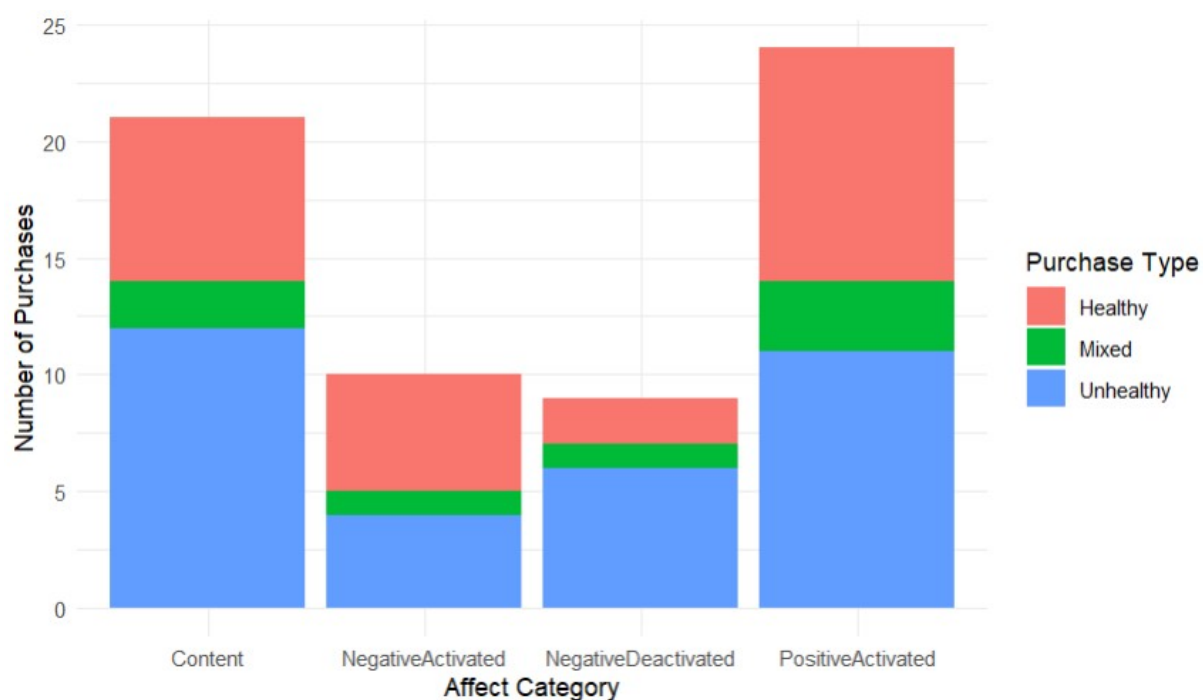
Mood-Linked Variations in Food Type Selection. As shown in Table 6, "*High Fat*" and "*High Sugar*" foods were the most frequently purchased items across both affect groups (Content/ Positive Activated & Negative Activated/ Negative Deactivated). It is evident that "*High Sugar*" foods make up more of the total purchases during negative affect (29.4%) compared to positive affect (17.5%), despite the raw counts being higher for positive affect. The "*High Fat*" category remains similarly high in both affect groups, being 23.5% for negative affect and 27.5% for positive affect. Healthy items such as "*Whole Grain*" and "*Protein*" were more prominent during positive affect. The category "*Vegetable*" occurred

more frequently during negative affect (17.6%) compared to positive affect (10%). While both affect groups were linked to energy-dense purchases, participants made more diverse and balanced food choices during positive affect, due to more frequent purchases of healthy items (e.g., Protein, Whole Grains). Regarding the above-mentioned results, the *H2* "*Consumers experiencing negative affect will buy more unhealthy foods than healthier options, compared to consumers experiencing positive affect.*" can be accepted.

Table 6

Food Subcategories Purchased by Affect Group

Subcategory	Negative Count	%	Positive Count	%
High Sugar	5	29.4%	7	17.5%
High Fat	4	23.5%	11	27.5%
High Carb	1	5.9%	2	5.0%
Salty Snack	0	0.0%	3	7.5%
Fruit	2	11.8%	3	7.5%
Vegetable	3	17.6%	4	10.00%
Protein	2	11.8%	6	15.0%
Whole Grain	0	0.0%	4	10.0%

Planned vs. Unplanned Purchases Across Affective States. Regarding the distribution between the affect group and the planning status of purchases, the majority of purchases were planned during positive affect (N = 32/ 45). Conversely, there were proportionally more unplanned purchases under negative affect than under positive affect, but

they were more evenly split between planned (N = 11) and unplanned (N = 8). In this regard, the *H1* "*Individuals under negative affect will purchase more unplanned food items than being under positive affect*." can be accepted.

Figure 4 illustrates how planned and unplanned purchases differ across food healthiness categories (Healthy, Mixed, Unhealthy). Most healthy purchases were planned, indicating greater intentionality behind health-conscious choices. In contrast, proportionally, more unhealthy purchases were unplanned, suggesting a link between impulsivity and less nutritious food selection. These results reinforce the idea that impulsive food decisions tend to skew toward unhealthier options, whereas planned behaviours are more strongly associated with healthier eating patterns.

Figure 4

Planned vs. Unplanned Purchases by Healthiness Category

Self-Reported Purchase Influences. Participants reported a range of factors influencing their food purchases. "*Craving*" was the most frequently reported influence (n = 44), followed by "*Affect*" (n = 24) and "*Social Influence*" (n = 21). Brand loyalty (n = 8) and discounts (n = 5) were reported less frequently. Compared to the previously mentioned self-reported data from the baseline questionnaire, the ranking of the factors is similar for "*Craving*" and "*Affect*", but "*Social Influence*" became more apparent during the ESM phase.

Figure 5 breaks these influences down by planning status. "*Cravings*" were a dominant factor in both planned and unplanned purchases, especially planned ones. Interestingly, "*Affect*" was more frequently cited for planned purchases than unplanned ones. "*Social Influence*" had a more balanced distribution between planned and unplanned purchases, with unplanned purchases slightly dominating. This suggests that even when purchases are planned, they are often guided by emotional and social motivations. Brand and discounts played a minor role regardless of planning status.

Figure 5

Frequency of Purchase Influences by Planning Status
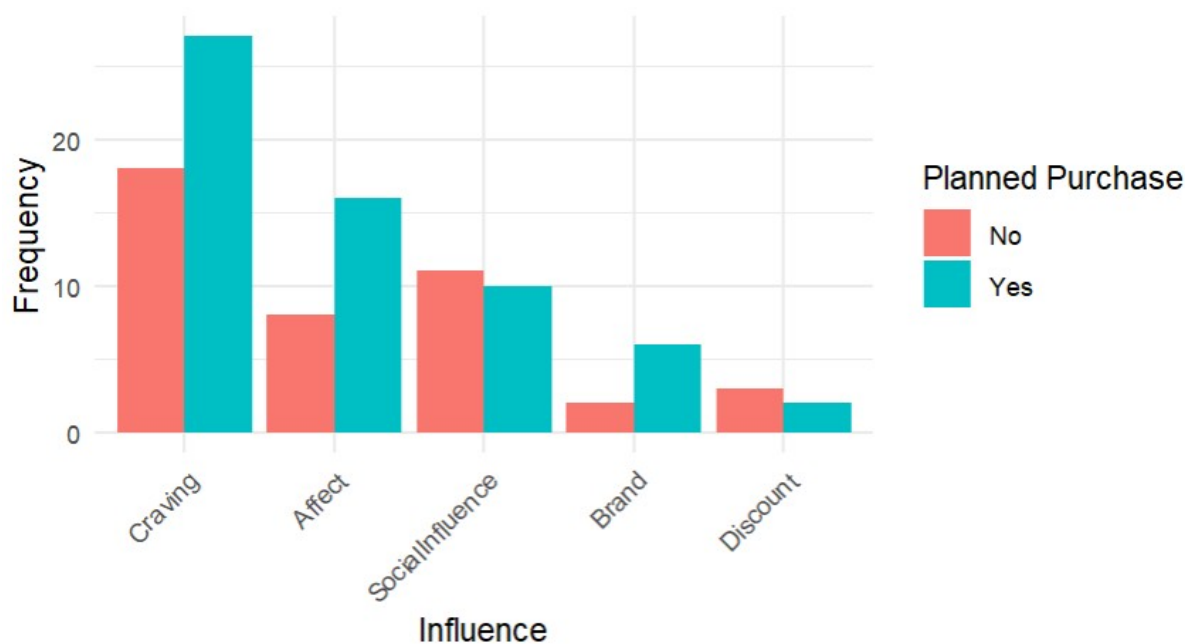
Further Context from the Follow-Up Questionnaire

During the follow-up questionnaire, participants were asked to reflect on their food purchasing behaviour and consider whether their mood was a potential influence. Most participants reported having used food as a form of coping with stress. For example, one participant stated, "*I had the feeling I would get food I connect with good memories, like my favourite chips, etc., to ease the feeling of discomfort when I felt stressed due to work or other influences.*". As a comparison, another participant reported, "*I noticed that I tended to buy more chocolatey things when I was sad. And when I'm angry or tense, I tend to buy more unhealthy stuff, salty food specifically* ". Both statements give insight into emotional eating tendencies and the craving for products containing high fat, salt or sugar, strengthening the first hypothesis.

Participants were asked if they noticed any of the listed patterns while experiencing negative emotions. Most of the participants (N = 5/7) reported having noticed that they tend to

engage in impulsive purchasing. Next, 4 out of 7 participants reported buying more sugary foods, and 3 out of 7 reported purchasing high fat products. This aligns well with the aforementioned results, as "*High Sugar*" and "*High Fat*" foods were indeed the most frequent purchases. Overall, these insights align well with the self-reported data from the baseline questionnaire at the beginning of the ESM phase, reflecting the participants' strong self-awareness.

Lastly, participants were asked if participating in this study made them more aware of how their mood influenced their food purchasing behaviour. While most participants reported that this study did not affect their awareness, two indicated the opposite. The insight from participant 5 supported the connection between negative emotions and purchasing unhealthy foods.

Participant 5 reported the following:

> I felt like I've always been a stress eater and looking at myself during this study just confirmed what I've always been thinking. Food for me is comfort and in most stressful situations or in the time I have for me to relax I prefer to choose food that helps me to calm down.

Interestingly, most of the photographic data he submitted was during the mood state "*Content*", which contrasts with his reflections. Participant 2 had a similar response concerning the connection between negative affect and unhealthy purchases. His statement additionally supported the link between affect and impulsive buying.

Participant 2 stated the following:

> I am more likely to stick with my planned purchases while being in a good mood without any stress. When facing the opposite state of mood, cravings set in and I often purchased unhealthier snacks and food options than I might have intended in the first

place. While I was stressed, I usually cut out most food purchases, whether intended or not and just bought something to cheer me up, mostly espresso.

It can be seen in that statement that it may be easier to adhere to planned purchases while under positive affect, which is the opposite for negative affect. Furthermore, he mentioned having noticed a tendency towards unplanned food purchases, while being around other people, because he mentioned: "*Feeling comfortable, especially around others usually made me spend more money on food* ". This statement provides insight into the rise of the "*Social Influence*" in the ESM data, compared to the self-reported data of the baseline questionnaire.

The last question's aim was to gain insight into whether this study motivated participants to change certain patterns. Most participants reported that they do not want to change anything. Conversely, one participant reported that he would try to be more aware of his mood. In contrast, another participant mentioned that he would try to avoid grocery shopping while being under negative affect or purchase healthier options regardless of the current affect.

Discussion

This study aimed to explore the extent to which negative affect influenced individuals' purchasing behaviour. Firstly, it wanted to determine whether individuals tended to purchase more unhealthy food with a high fat and/ or high sugar content and whether more impulsive purchases were made while under negative affect than under positive affect. The results support both hypotheses that negative affect is related to a greater tendency to make unhealthy

and/or impulsive purchases than positive affect. However, the positive affective state also had a relatively high count of unhealthy purchasing items.

Regarding the results, the first hypothesis, that participants would purchase more unhealthy food during negative affect than under positive affect, was confirmed. Most participants reported a shift in their eating behaviour by opting for comfort foods over healthier options when experiencing negative affect, indicating a potential tendency for emotional eating. However, an unexpected finding was a difference in the amount of healthy and unhealthy purchases between the two categories representing negative affect. The negative activated condition was associated with healthier purchases compared to the negative deactivated condition, even though they both represent negative affect. An explanation could be that the arousal or the activation level plays a role, rather than just valence (positive vs. negative). According to other research, negative deactivated states (e.g. sadness, fatigue), which are affective states with a low arousal, have been linked to an increased consumption of comfort foods, because they serve as a form of emotional regulation or self-soothing (O'Leary et al., 2022). In connection with this, these studies' results also confirmed that the foods used for emotional regulation primarily contained high fat or high sugar, both of which stimulate the release of insulin and endorphins, resulting in temporary mood enhancement. This aligns with the Affect Regulation Hypothesis mentioned earlier, which states that individuals engage in certain behaviours to regulate emotions and reduce distress (Macht, 2008). However, this does not seem to apply to the general concept of negative affect; it only applies to negative states with low arousal. Moreover, certain actions may be emotion specific. For instance, sadness is often associated with the desire for immediate relief, because individuals in that state may be less energised to regulate their emotions and therefore do not put much weight on health in their purchasing choices (Maier & Hare, 2020). This can be aligned with the self-regulation perspective and temporal construal theory discussed earlier, explaining that negative deactivated states might shift individuals more towards emotion-focused coping,

where a short-term relief through unhealthy food is prioritised over goal-oriented purchasing (Cachón-Rodríguez et al., 2024). The focus on immediate gratification impairs executive functioning because it consumes cognitive resources to process the affective state itself, which may reduce cognitive flexibility, lowering the individuals' capacity for flexibly evaluating purchasing choices (Yu, 2022). In comparison, negative activated states (e.g. anxiety, stress), which have high arousal, may trigger compensatory self-regulation, which is the process by which individuals respond to negative affective states by engaging in behaviour that restores a sense of control, order or goal alignment (Morawetz et al., 2020). This can lead to increased cognitive engagement, aiming to gain control over a particular situation, promoting more goal-oriented behaviour. For instance, an anxious person might develop an increased attention towards threats and risks, possibly including the health consequences of unhealthy food choices, leading to healthier purchases. To conclude, even though the valence is linked to the tendency towards unhealthy purchases, it can still be compensated by the level of arousal.

Nevertheless, a surprising finding was that many unhealthy purchases occurred during positive affect as well, although the purchases were more balanced than under negative affect. Convenience could be an explanation for this outcome. University students have a busy schedule, and easy access to convenience food can hinder healthier purchasing decisions, especially because it is not only an often quicker and easier option but also more affordable than healthier food items (Sogari et al., 2018). In addition, the university's food environment might also influence the students' dietary and purchasing decisions (Whatnall et al., 2021; Li et al., 2022). Campus food outlets are often stocked with energy-dense food and sugary drinks, while healthier options are less available or more expensive. Moreover, according to Li et al (2022), students rated taste as the most important factor when deciding to purchase a certain food item, followed by availability and cost. This shows that health is not a primary priority for university students when purchasing. This might be because this age group struggles less with health than older age groups and therefore might have less health-related

values. Similarly to the prior paragraph, there was also a difference between the two categories representing positive affect, "Positive Activated" and "Content". The category "Positive Activated" had an ideally balanced distribution of healthy and unhealthy purchases, while the category "Content" had a minimal skew in unhealthy purchases. According to Ashurst et al. (2018), positive affect was linked more to a distribution of healthy and unhealthy purchases, while negative affect was associated with a tendency for unhealthy purchases, which explains the even distribution in both positive affect categories. However, the higher proportion of unhealthy purchases in the content condition, even though slightly higher, can be explained via the same suggestion mentioned in the above-mentioned paragraph about the influence of arousal on cognitive engagement. Low-arousal states, such as contentment, may reduce the motivation for active goal pursuit or health-conscious decisions because it may signal that everything is fine, reducing the perceived need to monitor choices closely. In contrast, high-arousal positive affect can increase cognitive engagement and support more goal-oriented behaviours. Compared to the negative deactivated condition, participants in the content condition may not be seeking emotional-regulation through food, but rather making less reflective choices, due to the relaxing, low-effort nature of the affective state.

Moving on to the second hypothesis, it was apparent that most participants self-reported a tendency towards impulsive purchases, despite regularly using a shopping list. The findings have proven that participants with negative affect made more unplanned purchases than participants with positive affect. Regarding self-regulation, which was discussed earlier, negative affect may impair cognitive control, making it challenging for individuals to make thoughtful and planned decisions, leading to a tendency for impulsive purchases (Barros et al., 2024). Although participants indicated "Craving" as their most frequent influence on impulsive purchases, "Affect" is not the primary driver of this behaviour. This suggests that while craving appears to be more prominent in behaviour, affect might not always be

consciously recognised by the participant yet still might exert a strong influence (Sato et al., 2016). Particularly, when unplanned purchases are unhealthy, it can again be assumed that food purchases might serve as a mood enhancer to regulate stressful emotions, which in turn might increase the effect towards making impulsive decisions (Cachón-Rodríguez et al., 2024). Participants reported in the follow-up questionnaire that they tend to adhere to their plans when feeling positive, but the opposite occurs when they are in a bad mood. This reinforces the idea that affect significantly influences individuals' decision-making processes, with positive affect facilitating goal-directed decisions. In contrast, negative affect obstructs them and prioritises immediate satisfaction, as mentioned in the literature review at the beginning.

As can be derived from a general observation of the results, affect may not be the only factor influencing purchasing behaviour. For instance, an interesting finding was that "Social Influence" became a more frequently reported factor influencing impulsive purchases during the ESM phase compared to the self-reported data in the baseline questionnaire. Compared to the other participants, only one reported in the follow-up questionnaire that he had noticed purchasing more unplanned items while feeling comfortable around others. An explanation could be that most people are not always consciously aware of environmental influences towards their purchasing behaviour. In a study by Gligorić et al. (2023), they found that peoples' food purchasing behaviour might be influenced by food choice mimicry, which refers to the unconscious tendency to imitate the food purchasing choices of others. People might imitate other people purchasing choices because of social conformity, social bonding or cognitive shortcuts. This influence is often non-conscious, which might be why it was not reported in the beginning. Similarly, there is a question considering the example about the retailers' strategies, which was discussed earlier in the section on self-regulation. In this study, the categories "Brand" and "Discounts" were the least frequently reported factors, raising the question whether their influence is really not that significant or if participants do not

recognise their influence and therefore do not report it (Du, 2025). In summary, food purchasing behaviour is very complex, making it difficult to indicate how much influence affect really has on food purchasing behaviour, and should therefore be investigated further.

Strengths and Limitations

In the following section, the strengths and limitations of this study will be discussed. One limitation is the technical issues with the TIIM App that occurred during the data collection process. Firstly, there were upload issues from time to time where participants could not always submit the photos of their purchases through the app. Waiting while the BMS lab needed some time to investigate this issue, delayed the data flow and posed a risk of losing data. During this time, participants were instructed to send their purchases by WhatsApp or email, which compromised anonymity, on the one hand and increased workload for the researchers through sorting the data. Additionally, when participants could take a photo and fill out a prompt, uploading failures or saving errors were possible, consequently leading to data loss. Lastly, by the end of the data collection, it was revealed that TIIM had a limited storage capacity to handle so much data, since photos require more storage space than solely questionnaires. This study exceeded this limit, causing additional data loss because no new data could be collected. It seems that the format of the study design, using the photo diary method, was unsuitable for an app such as TIIM. Despite the aforementioned issues, this study design has much potential, but regarding future studies, another software should be used with enough storage capacity, for instance Ethica (Ethica Data, n.d.) or mEMA (ilumivu, n.d.; Battaglia & Patridge, 2022; Michelle et al., 2022). So far, there is no research that has used Ethica with a similar study design. Nevertheless, this platform has a high potential for exploration, since it seems to have enough storage capacity and the function to collect visual data like photographs.

The section above already raised the topic about the usage of visual data, like photographs. This study's other aim was to reflect on the feasibility of the experienced sampling method (ESM) and the photo diary method for this type of study. In this regard, both tools have much potential for capturing real-time data to investigate purchasing behaviour and affect. The ESM is beneficial in capturing dynamic processes such as mood fluctuations, decision-making and behaviour across different contexts. Its advantage lies in capturing data "in the moment", which provides a more reliable way of gathering data on the everyday life of constantly fleeting factors such as affect, without relying on the reconstruction of past events, which poses a risk for recall biases or inaccuracy. The photo diary method is an easy and quick way to gain visual data. Mueller-Stierling et al. (2021) conducted a study on the feasibility of different data collection methods, including the photo diary method. This method received a good rating from the participants because of its easy usage. But why are these methods only regarded as having good potential? Regarding the response rate, more than half of all prompts that were sent to all participants remained unanswered, which is a really high number. This low response rate is most likely the result of the technical issues with the TIIM app, which were discussed above, since they hindered the participants from participating properly. Besides, there were no complaints from the participants regarding the prompting or uploading photos, but more about the uncertainty and confusion about them not being able to select the option of making or uploading a photo or generally answering a prompt as they wanted to. Additionally, it was not possible via TIIM to offer participants the option to report their purchases themselves without waiting for a prompt, which was very unfortunate since it did not allow for much flexibility. Therefore, these issues made it challenging to assess and formulate a clear and proper conclusion on whether the ESM and the photo diary method are feasible tools. Nevertheless, gaining photographic data in the study gained more freedom in interpreting food purchases. Of course, it still raised the question if the whole process would be quicker and easier, both for the researcher and the

participant, if the participants only had to report their purchases by writing them down instead of uploading a photo. Regarding this question, the strength of the photo diary method is that it minimises participant burden by saving time and cognitive effort, since describing the purchase is not necessary, which is especially helpful when participants do not know the name because of the missing label or if the purchase is unfamiliar. From a researcher's perspective, a description of a purchase may not always be informative, because there is always the possibility that participants receive ESM prompts at inopportune times, or, leading to rushed or careless answers or a lack of participation resulting in inaccurate data (van Berkel et al., 2017). Inaccurate descriptions can become a challenge to the researcher in interpreting the purchases. During this study, photographs allowed more freedom and precision in interpreting and categorising the purchases, especially when one item consisted of many different items (e.g. a wrap), another strength of the photo diary method. In this regard, if the use of both methods is going to be considered, it should be ensured that the ESM questionnaires are short and compact to minimise participant burden and reduce a high level of participant disruption. Overall, both methods have the potential to yield rich, contextual data.

Another limitation might be that the sample may not reflect the broader population. A surprising finding was that participants mostly indicated positive affect, despite the expectation that negative activated affects (feeling stressed or anxious) would be the most frequent. Since the study was conducted during a regular semester and not during an examination period, this might have affected the emotional variability mentioned above. In connection with this, existing research whose aim was to investigate the mood change of university students during examination periods confirmed that students experienced lowered mood and higher anxiety and cortisol levels, indicating negative affect (Lahme et al., 2024; O'Flynn et al., 2017; Zunhammer et al., 2013). Therefore, if the aim is to investigate the influence of negative affect, a recommendation for future research might be to schedule data collection specifically during examination periods.

Lastly, another limitation is that this study did not collect data on the participants' health-related values or lifestyle goals. This information might be valuable because we cannot isolate affect as the sole driver of purchasing behaviour in this study. For instance, someone who highly values health might consistently choose healthier foods regardless of their emotional state. Alternatively, suppose a person values balance and purchases something that would fall into the unhealthy category. How can we be sure that this person purchased this item due to emotional influences and not just because they craved it? And to what extent would this be considered unhealthy when the person mainly purchases healthy food? Without this information, it may be difficult to interpret how much influence affect might have on food purchasing behaviour. Therefore, regarding future research, in addition to including personal health values and dietary goals, it may be beneficial to consider longer tracking phases in the future in order to be able to detect patterns and integrate interviews to gain more insight into the participants' experiences, thus contextualising their choices.

Practical Implications and Future Research Directions

The findings of this study hold many implications for future research, which will be discussed in the following section. This study provides an insight into how affect influences purchasing behaviour, which can be practical in different settings.

The outcome of this study showed that individuals are more inclined to unplanned and unhealthy purchases than healthy ones while experiencing negative affect. However, prior research has proven that healthy eating can help with emotional regulation and increase productivity (Firth et al., 2020). For instance, complex carbs boost serotonin and stabilise blood sugar, magnesium-rich foods reduce anxiety and support muscle relaxation, probiotic foods support the gut-brain axis, which is linked to better emotional regulation, etc. (Berding et al., 2021; The Nutrition Institute). In this regard, it would be interesting to investigate

whether individuals who are engaged in stressful environments such as workplace settings, schools and universities can be supported through stressful periods. Specifically, these environments could support individuals by implementing more emotion-sensitive food options. People tend to purchase unhealthy food because it is thought to be the quicker and easier option, associated with enjoyment and relaxation. Using this knowledge and the knowledge gained from prior research, interventions could focus on promoting easy-to-go versions of these foods, such as oatmeal cups or yoghurt bowls and consider combining physical comfort with emotional comfort, such as warm soups, herbal teas, healthier cakes or smoothies. Incorporating this knowledge can help society to cope with the influence of negative affect on purchasing behaviour more healthily and productively. This also raises the question of whether such strategies might lead to habitual changes, with people associating healthy food with emotional relief and consequently starting to purchase healthier items more frequently than unhealthy items outside their work environment.

In connection with the implication mentioned above, research can be done on designing public health campaigns targeting emotional eating. This research would aim to investigate the extent to which such campaigns could be effective in helping people recognise how negative affect influences their food purchasing behaviour and to promote emotional awareness and non-food coping strategies, such as cognitive reappraisal or mindfulness. Of course, there is the question of whether there is really affect influencing a purchase and not just a craving or another influence. Still, this implication could help individuals with an emotional eating tendency become aware of the influence of their affective state on their purchasing behaviour and learn to cope with it more healthily. It is especially important because an overconsumption of unhealthy food is linked to obesity, diabetes and cardiovascular diseases, which are the most common causes of death in the population (Drewnowski & Rehm, 2014). Prior research has already proven the effectiveness of different message framings, such as positive reinforcement and risk warnings have on behaviour

change (Balcetis et al., 2020; Vidal et al., 2019). In this regard, incorporating these findings could help to reduce emotional overconsumption of unhealthy food, because of its link to various diseases.

Moreover, as could be seen in the results, it was difficult to determine how much influence affect had on purchasing behaviour. Eating and purchasing behaviour are very complex topics, since many overlapping factors, such as health goals, culture or habits, also influence them, making it difficult to determine the actual influence of affect. For instance, a person from Japan, a country that is known for their healthy and varied cuisine (Imai et al., 2019), might choose healthier food than a person from America, where the consumption of high-fat or high-sugar products is higher (Drewnowski & Rehm, 2014). In this regard, future studies could focus on the extent on how much influence affect has on purchasing behaviour. Given the complexity uncovered in real-life settings through this study, controlled lab studies can help isolate the specific role of affect. While real-world settings are important for understanding actual behaviour, experimental studies can complement this by isolating affect as a variable and testing causal effects more precisely. Since participants reported "*Craving*" more frequently than "*Affect*", it raises the question whether affect operates indirectly or is simply less consciously recognised, where controlled experiments could help clarify this. Causal testing using mood manipulations and experimental designs could be an idea to investigate this more in-depth. For instance, participants are randomly assigned to negative, neutral or positive affect conditions caused by emotional videos, for example. After, their purchasing behaviour would be measured in controlled settings, such as through virtual shopping tasks or lab stores. However, one should always be aware of potential biases, since controlled environments influence participant behaviour differently than real-world environments (van Herpen et al., 2016; Müller, 2021). Nevertheless, this way it could be tried to be established how much influence negative affect has concretely in the increase in

unplanned or unhealthy purchases. Real-life studies were needed to see the big picture, now laboratory studies are needed to zoom on affect and test its causal weight.

Conclusion

In conclusion, the study aimed to explore whether negative affect has an influence on unplanned and unhealthy purchases. This study confirmed that while experiencing negative affect, participants made more unplanned and unhealthy purchases, particularly those having a high fat and high sugar content. Even though causality could not be established, the patterns observed during experienced sampling and participants' reflections suggest that affect may play an important role in shaping consumer behaviour. These insights highlight the complexity of emotional influences on decision-making and the importance of using larger and more diverse samples in further research. Therefore, understanding how affect impacts food purchasing decisions may aid in developing more effective interventions for promoting healthier and more intentional behaviours.

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Appendix A

Informed Consent Form

Consent Form for the Study: Exploring the Influence of Mood States on Food Purchasing Behaviour
YOU WILL BE GIVEN A COPY OF THIS INFORMED CONSENT FORM

You are invited to participate in a study conducted by students from the University of Twente. The purpose of this study is to explore how mood states influence food purchasing behaviour in everyday life. This research aims to better understand the relationship between emotions and consumer behaviour, which could provide insights for promoting healthier eating habits or improving marketing strategies. The results may be used to inform public health initiatives, retail strategies, and consumer awareness campaigns. The study will involve the following procedures:

- Baseline Questionnaire: Before starting the main study, you will complete a short questionnaire about your general mood patterns, shopping habits, and eating behaviours. This will take approximately 15 minutes.
- Experience Sampling Method (ESM) Surveys: During the study, you will receive 3–5 prompts per day via the TIIM app over a 7-day period. These short surveys will ask about your current mood, any recent food purchases, and situational factors (e.g., location, whether you were shopping alone or with others). Each survey will take approximately 2–3 minutes to complete.
- Follow-up Interview: After the 7-day data collection period, you will participate in a 15–30-minute interview to reflect on your experiences, your mood patterns, and how you believe these influenced your purchasing behaviour.

Potential Risks: While this study poses minimal risk, reflecting on your mood and purchasing habits multiple times per day may cause mild emotional discomfort for some participants. If you experience distress, you are encouraged to skip questions or take breaks when needed.

Participation is voluntary, and you may withdraw at any time without consequence.

Please tick the appropriate boxes	Yes	No
Taking part in the study		
I have read and understood the study information dated [DD/MM/YYYY], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐

I consent voluntarily to participate in this study and understand that I can refuse to answer questions and withdraw from the study at any time without having to give a reason. ☐ ☐

I understand that participating in the study involves completing: ☐ ☐

- A **baseline questionnaire** about my mood, shopping habits, and eating behaviours.
- **3–5 short surveys per day** for **7 days** using the **TIIM app** to report my mood, food purchases, and situational context.
- A **follow-up interview** to reflect on my purchasing decisions.
- I understand that my participation will require approximately **2–3 minutes per prompt** and around **15–30 minutes** for the baseline and follow-up interview.

Use of the information in the study

I understand that the information I provide will be used solely for a report prepared by the researchers of the study "Exploring the Influence of Mood States on Food Purchasing Behaviour" at the University of Twente. My responses will be fully anonymised in the final report to ensure my privacy and confidentiality. ☐ ☐

I give the researchers permission to keep my contact information and to contact me for future research projects. ☐ ☐

- Email if yes _____

_____   _____

Signature (Participant)   Date

I have accurately read the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands what they are freely consenting to.

_____   _____   _____
Researcher name   Signature   Date

Study contact details for further information:

Olesja Skobeev: o.skobeev@student.utwente.nl

Wouter Smink: w.t.a.smink@student.utwente.nl

Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Secretary of the Ethics Committee/domain Humanities & Social Sciences of the Faculty of Behavioural, Management and Social Sciences at the University of Twente by ethicscommittee-hss@utwente.nl

Appendix B

Baseline Questionnaire

1. What is your nationality?
    a. Dutch
    b. German
    c. Other

2. What is your sex?
    a. Male
    b. Female
    c. Non-binary
    d. I prefer not to disclose

3. What is your age?

    Slider from 16 up to 25

4. How often do you eat regular meals? (such as breakfast, lunch and dinner)
    a. Never
    b. Occasionally
    c. Often
    d. Always

5. How often do you snack between meals? (when you eat or drink something that is not during breakfast, lunch or dinner)
    a. Rarely/ Never
    b. Occasionally (1-3 times per week)
    c. Often (4-6 times per week)
    d. Daily

6. Do you notice changes in your eating habits when you experience negative emotions? (e.g., stress, sadness, anxiety)
    a. Yes, I tend to eat more.
    b. Yes, I tend to eat less.
    c. No, my eating habits do not change.

7. When feeling negative emotions, how often do you consume comfort foods? (high-fat/high-sugar)
    a. 1 Never
    b. 2 Rarely
    c. 3 Sometimes

    d. 4 More often than not

    e. 5 Always

8. When feeling negative emotions, how often do you consume healthier options?

    a. 1 Never

    b. 2 Rarely

    c. 3 Sometimes

    d. 4 More often than not

    e. 5 Always

9. How often do you go grocery shopping?

    a. Rarely/Never

    b. Occasionally (1–2 times per month)

    c. Often (1–2 times per week)

    d. Very frequently (3+ times per week)

10. When you go grocery shopping, how often do you create a shopping list in advance?

    a. Rarely/Never

    b. Occasionally

    c. Often

    d. Always

11. How often do you make unplanned or impulsive food purchases while shopping?

    a. 1 Never

    b. 2 Rarely

    c. 3 Sometimes

    d. 4 More often than not

    e. 5 Always

12. When making impulsive purchases, which factors influence you the most? (check all that apply) *Multiple answers can be selected by the participants*

    a. Mood/emotions

    b. Cravings

    c. Promotions/discounts

    d. Convenience

    e. Brand recognition

13. How often do you order food for delivery or takeout?

    a. Daily

    b. Weekly

      c. Monthly

      d. Rarely

14. Do you regularly purchase food in non-traditional settings? (e.g., vending machines, cafes, etc.)

      a. Yes

      b. No

15. Do you have any favourite food brands? *This was an open question*

      a. (If yes, please specify)

        (If no, please type "No")

16. How often do you purchase premium-branded foods? (e.g. Coca Cola, Pepsi, M&M's, Pink Lady, Lays etc.)

      a. Rarely/Never

      b. Occasionally

      c. Often

      d. Always

17. When choosing between a well-known premium brand and a budget brand for a similar product, how often do you select the premium option?

      a. 1 Never

      b. 2 Rarely

      c. 3 Sometimes

      d. 4 More often than not

      e. 5 Always

The PANAS-SF was taken as the last part of the baseline questionnaire:

Positive and Negative Affect Schedule (PANAS-SF)

Indicate the extent you have felt this way over the past week.		Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
PANAS 1	Interested	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 2	Distressed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 3	Excited	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 4	Upset	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 5	Strong	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 6	Guilty	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 7	Scared	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 8	Hostile	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 9	Enthusiastic	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 10	Proud	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 11	Irritable	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 12	Alert	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 13	Ashamed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 14	Inspired	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 15	Nervous	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 16	Determined	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 17	Attentive	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 18	Jittery	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 19	Active	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 20	Afraid	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Appendix C

ESM Prompt

1. Since the last prompt, did you purchase any food?
    a. Yes (*ESM continues as normal*)
    b. No *(ESM gets skipped and participant sees "Thank you" screen)*
2. Could you take a picture of the food item (snack, drink etc.) you purchased? (Make this picture in such a way that the front label is clearly visible)
    a. *Here participants could upload their picture*
3. Does the food item you bought have a nutrition value table or text on the packaging?
    a. Yes *(ESM continues as normal)*
    b. No *(Next photo question is skipped)*
4. Could you take a picture of the nutrition value table or text on the packaging of the product you bought? (Take the picture in such a way the text is clearly readable)
    a. *Here participants could upload their picture*
5. Here the Momentary Affect Scale (MAS) was answered on a scale from 1-10.

6. Was this purchase planned?
    a. Yes
    b. No
7. Did this purchase belong to a premium brand you're familiar with? (Premium brand being brands such as: Coca Cola, Pepsi, Starbucks, M&M's, Pink Lady, etc.)
    a. Yes *(ESM continued as normal)*
    b. No *(Next question is skipped)*
8. Do you usually buy items from this brand?
    a. Yes
    b. No
9. What do you believe influenced your purchase/meal choice the most? (check all that apply) *Participants were able to give multiple answers here*
    a. Your mood/emotions
    b. Cravings
    c. Promotions/discounts
    d. Brand preference
    e. Social influence (e.g., shopping with others)

Thank you for answering this prompt!!

Appendix D

Follow-Up Questionnaire

1. Did you notice a connection between your mood and your food purchasing/eating behaviour during the study?
    a. Yes *(Questionnaire continues as normal)*
    b. No *(Next question is skipped)*

2. If yes, please describe this connection. Please formulate precisely. *This was an open-ended question*

3. When feeling negative emotions, did you notice any of the following patterns? (Check all that apply.) *Participants could pick multiple answers*
    a. Purchasing more unplanned or impulsive items
    b. High-fat comfort foods (e.g., pizza, burgers)
    c. High-sugar foods (e.g., chocolate, candy)
    d. Salty snacks (e.g., chips, pretzels)
    e. Healthier options (e.g., fruits, vegetables)
    f. Experiencing no noticeable changes

4. When feeling positive emotions, did you notice a stronger preference for certain brands or premium products?
    a. Yes
    b. No
    c. I don't know

5. When feeling positive emotions, did you notice yourself being more intentional in your food choices? (e.g., choosing a premium brand or opting for healthier foods)
    a. Yes
    b. No
    c. I don't know

6. Has participating in this study made you more aware of how your mood influences your food purchasing behaviour?
    a. Yes *(Questionnaire is continued as normal)*
    b. No *(Next question is skipped)*

7. If yes, what insights did you gain? (Please formulate this precisely.) *This was an open-ended question*

8. Are there any food-related habits or decisions you might change after participating in this study? *Open-ended question*

a. (If yes, mention them)

b. (If no, answer "No")

Appendix E

AI Statement

"During the preparation of this work, I used ChatGPT for reflective purposes during my data analysis. After using this tool/service, I thoroughly reviewed and edited the content as needed, taking full responsibility for the final outcome."