

# **Togetherness as a way to enhance memorability – Biometric research on group dining experiences**

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| <b>Thesis title</b><br>Togetherness as a way to enhance memorability – Biometric research on group dining experiences  | <b>Number of pages and appendix pages</b><br><b>45 + 4</b> |
| <p>Due to the rising demand for developing memorable and exceptional customer experiences, while recognising the key role of emotions as its constituent, a growing attention has focused on understanding the conditions they flourish under. As the nature of emotions is ambiguous, use of extensive methods such as measuring bodily reactions is needed to complement self-reflective data, which by itself, is utterly inadequate to capture the unconscious side of these events. Simultaneously, the special characteristics affecting group experiences have been left with little attention, even though the social aspect of experiences is often the very reason for engaging in them. Harnessing the human need for belonging into the core of a service offering in the context of shared experiences, an enhanced level of memorability could be reached through togetherness and so-called we experiences.</p> <p>In this study, these phenomena are approached with psychophysiological measures, adapting biometric research methods to compliment retrospection in order to understand the interplay of physical and psychological reactions. By these means, the paper seeks answers to the relation of togetherness and memorability, while hoping to contribute to the overall understanding of group experiences in the field of hospitality. The research case was built on a technology-enhanced dining experience, where a group was separated by physical distance but reunited over a shared dinner, as dining experiences could be described as one of the key offerings in hospitality, and often marked by social interaction within one's social groups.</p> <p>Due to the global pandemic, the amount of data gathered was significantly smaller than planned. However, together with the theoretical findings, the study contributes to the knowledge around the themes of group experiences and memorability. The research concludes, that once sustained, a sense of togetherness will not be diminished by the means of interaction, and that this elevated feeling of experiencing together, the we experience, could be a route to enhanced memory processing due to the social nature emotions. The findings support the view that emotions do play a key role in the creation of memorable customer experiences, but when further assessing group experiences as a construct, the social dimension cannot be diminished, but it is strongly interlinked to the memorability together with the emotions.</p> |  |
| <b>Keywords</b><br>Memorable experiences, group experiences, emotions, togetherness, biometric research  |  |

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# 1 Introduction

“Doing it together, is better than doing it alone”, as Walker (2010, 16) concluded at the end of his investigation on social flow. Many other studies have also concluded that people claim to be the happiest among friends and family, and Csikszentmihalyi (1990, 165–166) state that we as humans, are programmed to seek the company of others. Today’s consumers are more demanding, looking for emotionally rich and meaningful experiences. This has created a demand in the industry to address customer needs and manage customer experiences in a way, that keeps the company ahead of its competitors. By merging these needs together and translating the human desire for connection into the service offerings, the businesses could harness the social aspect to be the driver for more memorable experiences.

Emotions are an important component in the creation of experiences, but yet we know so little of how they contribute to shaping them. The majority of the studies on this topic are based on self-reports which are evidently both efficient and beneficial, but rely completely on the ability of the participants to observe and recall one's own emotions and their willingness to report them. Self-reports also fail to recognise the unconscious side of emotional episodes and therefore this method is deficient for fully understanding the role of emotions in the creation of experiences. While Boswijk et al. (2006) define emotions to be the common denominator for memorable experiences and Bastiaansen et al. (2019) suggest that emotions should be at the core of designing and optimising experiences, Verhulst et al. (2020) suggest that neurophysiological measurements could be better equipped to understand the complex nature of emotions. These observations served as a starting point for this research among with the notion that group experiences, even though a highly relevant construct in the hospitality industry, was not addressed much in the field’s research. (Bastiaansen et al. 2019; Larsen & Fredrickson 1999, 44–49.)

The objective of the thesis was to understand the special conditions affecting the memorability of an experience in a group context, through achieving a sense of togetherness, a heightened feeling of unitedness and experiencing together. The underlying question was, that whether these conditions can be met in a digitally enhanced service setting where a group is separated by a physical distance. The study approached these questions by combining previous knowledge mainly from the fields of hospitality and psychology, while taking a particular interest in the role of emotions in shaping such hedonistic experiences. The purpose of the thesis was twofold. First, the aim was to design and execute a pilot study that can be later used as a base for a study design of a

full-scale research on the same topic. Second, the thesis was seeking to collect valid data, which could be used to study the questions at hand.

The main research question was: Can a sense of togetherness contribute to the memorability of a dining experience over spatial distance?

Sub-question 1: Can a feeling of togetherness be achieved over spatial distance?

Sub-question 2: Does synchronisation of biosignals equate to the level of felt togetherness?

Sub-question 3: Does the measured intensity of emotions correspond to the subjective memory?

To build a valid study on these phenomena, narrowing the focus and delimitations were needed. An approach was taken to examine the phenomena under the context of dining experiences, as such events are one of the key offerings in the hospitality industry, but also often enjoyed in groups and marked by social encounters and meetings within one's social group. As the topic is deep, experiences as a construct are only shortly discussed on a basic level before examining the special features affecting memorability and group experiences. For emotions and the neural processes connecting to the phenomena, only a simplified view is offered due to the vast complexity of the topic, but adequate enough to build an understanding of the connections of these phenomena in the scope of this research.

The thesis explored these topics with a psychophysiological approach, utilising bodily measurements to understand psychological reactions. As stated before, the validity of self-reports as a tool for understanding aroused emotions during an experience is limited, but methods borrowed from psychophysiology could reveal insights into the unconscious reactions (Gaffey & Wirth 2014, 5181). By understanding the interplay between psychological and physical phenomena, we can better understand emotions and their further contribution to experiencing. Therefore, the research methods combined biometric measuring with self-reflections, and participant observation. The data was gathered in a controlled dual-setup situation, where a group of participants were divided into two locations and interaction between the subgroups happened through a video call. The data was collected from each participant and later combined for analysis. The data collection had five methods; pre-questionnaire to understand the group dynamics, biometric data collection during an interactive group experience, participant observation during the same phase, semi-structured interview after the experiment to understand the subjective experience of the participants, and an introspective evaluation of felt togetherness based

on chosen videoclips from the recorded experience. By combining different methods, the phenomena concerning the research questions could be examined on a sufficient level.

## **2 The role of emotions in memorable group experiences**

The theoretical framework explores the topics of memorable and optimal experiences, and looks into the research of what is currently known about the role of emotions in human behaviour, and in the creation of memories and re-calling them. Second, the framework as a whole aims to understand the special characteristics affecting these phenomena in the context of group experiences, and how a sense of togetherness is shaped through emotions and interaction. A wide amount of literature was reviewed and relevant findings gathered from a variety of academic sources, mainly from the fields of hospitality, psychology, and neuroscience. The first sub-chapter reviews literature and theories focusing on the topic of experiences, while the second sub-chapter deep dives into the current knowledge and research in the argued field of emotion research. The findings of the first two sub-chapters are reflected against the study case in the last sub-chapter, where key conclusions are drawn and presented. The conclusions made are put into test in the empirical part.

### **2.1 Experiences**

Experiences are one of the key offerings in the service industry, and an experience, as perceived by a customer, holds a significant value. Customer experiences (CX) have the potential to become a competitive advantage against competitors as they do not only affect the customer themselves and their possible re-purchasing decision, but it can become an efficient marketing tool for a company via word-of-mouth, both in good and in bad (Cao et al. 2019, 308). Strategic management of customer experiences has become increasingly more viable in the modern global market, where customers have an endless amount of information and options easily within their reach. Inversini, De Carlo and Masiero (2020, 1) concluded that “being customer-centric is paramount for hospitality establishments to create and sustain superior customer value”, and that is why customer-centricity should be at the core of the experience design. Experience itself is a variable construct when we look at it from the hospitality point of view. Experience, as a service offering, can be short like popping into a shop, it can be few hours like a dinner in a restaurant, or it can be anything from a day trip to Disneyland to a one-week all-inclusive resort holiday in Cancun. Experiences vary in length but what all have in common is that they have three clear stages; pre-experience which is before the actual activity but crucial for gaining the attention of a customer and convincing them to buy the product; during the experience which is the actual activity or multiple activities that together form a clear entity like a holiday in the Bahamas; and past-experience which is important for building customer loyalty and enhancing retention (Klaus & Maklan 2013, 238).



Pine and Gilmore (2019, xiv), the pioneers of experience management, state that the most robust experiences are the ones that hit the sweet spot, strongly combining elements from all four realms of their experience model. The Four Realms of Experience model (Figure 1) thrives from the engagement of customers, dividing the dimensions based on the level of participation and connection. The first realm, entertainment, is a type of experience where the participants tend to absorb passively rather than getting deep into the action, like in a theatre watching a play. The second, educational, differs in the level of participation which tends to be more active compared to the previous realm, like when taking a driving lesson. The third realm, escapist, is both active and immersive, like in an escape room where the participants are active by solving the mysteries while simultaneously immersed in the story. The fourth realm, esthetic, keeps the participants immersed but their role is less active, like on a whale safari or when admiring the wonders of the world in a museum. (Pine & Gilmore 2019, 39–48.)

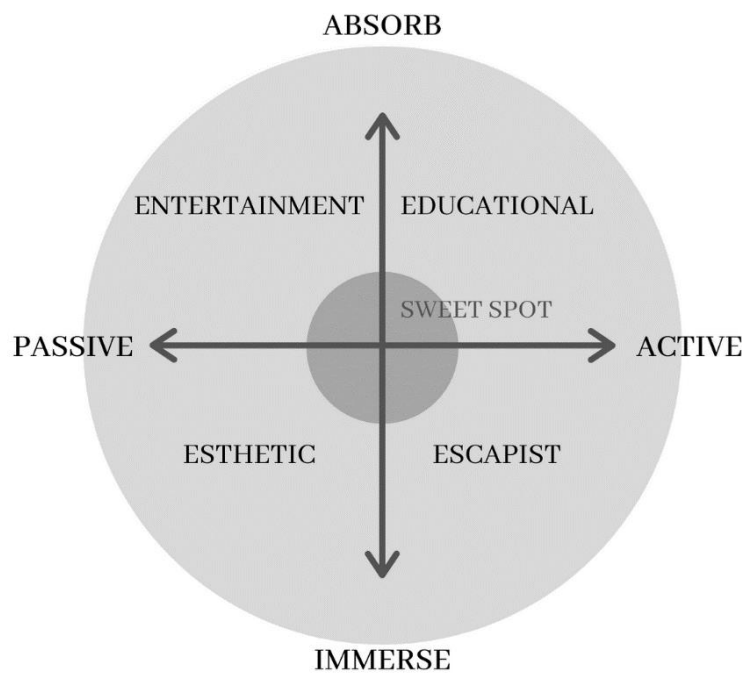


Figure 1. The Four Realms of Experience model (Adapted from Pine & Gilmore 2019, 39)

This chapter as a whole, aims to clarify the special conditions that affect group experiences, and understand what makes such experiences memorable. Therefore, experience design itself is not discussed in depth nor other popular models presented. Now, after introducing the characteristics of experiences as a service offering in brief, the first sub-chapter will aim to form an understanding of the factors influencing the memorability of an experience by deconstructing it down to its constituents. The second

sub-chapter presents the Flow theory which is described as a state of an optimal experience resulting in a positive outcome, and reviews a theory on motivations that may lead an individual into a state of flow. The third sub-chapter focuses on shared experiences and draw from the activity theory, which may help in understanding the factors affecting experiences within a social context.

### **2.1.1 Memorable experiences**

Not all the experiences are equal so what makes an experience memorable? The features contributing to the memorability of an experience has gained a growing interest in the hospitality field as building and managing such experiences is evidently an advantage on the market (Cao et al. 2019, 308–309). A strategic experiential module for managing customer experiences developed by Schmitt (1999) had five elements to consider; sense, feel, think, act, and relate, and his work has been considered pathfinding for many other experience studies. Pine and Gilmore (2019) identified five factors that contribute to the memorability of an experience; theme of the experience, harmonising impressions with positive cues, eliminating negative cues, mix in memorabilia, and engaging all five senses. By adjusting all these elements into a cohesive entity, one should be able to create an engaging and memorable experience. Kim, Ritchie and McCormick (2012) defined a memorable tourism experience (MTE) as “a tourism experience positively remembered and recalled after the event has occurred”, and identified seven elements that influence the memorability of such experience; hedonism, involvement, local culture, refreshment, meaningfulness, knowledge and novelty. A few years later Stone et al. (2017, 1) found five elements that seemed to contribute to the memorability of culinary experiences while travelling; consumables, location, companions, occasion, and touristic elements. They further suggested that many experiences might become memorable because of the social aspect, and who is the event shared with. In their study, many of the dining memories were related to social situations such as having dinner with a spouse, friends or meeting locals. (Stone et al. 2017, 7.)

Cao et al. (2019, 310) adapted Schmitt’s framework and proposed a model that captures the memorability of hedonic consumer experiences. They suggest that memorable dining experiences (MDE) are constructed from five elements; sensory, affect, behavioural, social, and intellectual. The sensory dimension highlights the importance of multisensory stimuli, as it affects the level of immersion. Especially relating to dining experiences where food is one of the most crucial elements, senses play a key role, as all five classic sensory channels influence the pleasantness of food consumption (Kalat 2019). Moreover, sensory inputs play a major role in the formation of perception, as only sensations

reaching a certain threshold can gain our attention, and cause further reactions such as emotions. The affect dimension considering moods and emotions was recognised as a key contributor in the creation of MDE's. Creating a positive atmosphere and implementing positive cues is obvious in the creation of services, but their importance for memorability cannot be highlighted enough due to the impact of emotions in memory processes, which will be discussed in more detail in a later chapter. The behavioural dimension indicates that for a dinner to become memorable, it has to be more than just a moment of food consumption. The experience should contain physical or mental elements that are engaging and catch the attention of the customer in order to enhance memorability. As visiting a restaurant is often connected to spending time with others, the social dimension highlights the importance of these social interactions and sharing the experience with someone. The intellectual dimension refers to the engagement of customers via thinking or learning, where their curiosity is fed by either learning something new as e.g. about a specific cuisine, ingredients or local history, or by utilising their already existing skills or knowledge like when picking suitable wines for different plates. (Cao et al. 2019, 310–315.)

There are many other models that attempt to capture the dimensions affecting the memorability of experiences, but Bastiaansen et al. (2019) argue that the focus of the studies should be concentrated on emotions that occur during an experience to capture the memorability of it, due to the fact that emotions are responses to stimuli that hold personal relevance. If a stimulus does not provoke any emotional responses, it does not reach a certain threshold meaning that it is not seen important enough, and further on, it is unlikely that the experience will leave a mark on an individual's memory encouraging retention or other favourable customer behaviour. In an attempt to summarise the findings of this chapter, the common elements in many of these models addressing memorability are senses, positive emotions, social interaction and a sense of meaning. For a further understanding of why some experiences may become memorable, the next sub-chapter examines the role of motivations and how they might lead an individual into a so-called flow-state, which is described as a state of an optimal experience.

### **2.1.2 Optimal experiences**

A state of flow has been connected to the level of memorability of an experience. Flow can be described as a state of an optimal experience, which is both enjoyable and so engaging that a person may temporarily lose self-consciousness and track of time. State of flow is a positively valenced state which has characteristics that have been found to be universal. This sub-chapter reviews literature that is ground-breaking for understanding

optimal experiences, and motivational patterns that serve as a push factor for an action opportunity, enhancing the possibility of reaching the optimal experience. (Brannon Barhorst et al. 2021, 423–425; Folmer et al. 2019.)

The theory of flow was introduced by Csikszentmihalyi during his pursuit to understand optimal experiences. His research strove to identify the conditions where such enjoyable experiences occur and the reasons that contributed to the achieved level of enjoyment. Optimal experiences are shaped by an individual’s perception and can only be achieved through a sufficient level of involvement and effort. A state of flow is a state of ultimate concentration, where one’s abilities are challenged to an intriguing task matching their skill levels, interests and personal goals, that leads to an optimal experience. As showcased in figure 2, staying in the flow requires constant harmonious development of challenge and skills. Individual’s skill level will eventually grow by simply performing the act and as doing so, the challenge must rise as well or the dominance of another factor will lead to either boredom or anxiety. A state of flow can occur spontaneously as a result of an engaging conversation or during a goal-directed activity like attempting to perform a backflip without falling down on a skiing slope. Successfully accomplishing such task ensues in joy and fulfillment. (Csikszentmihalyi 1990, 1–4, 74–75.)

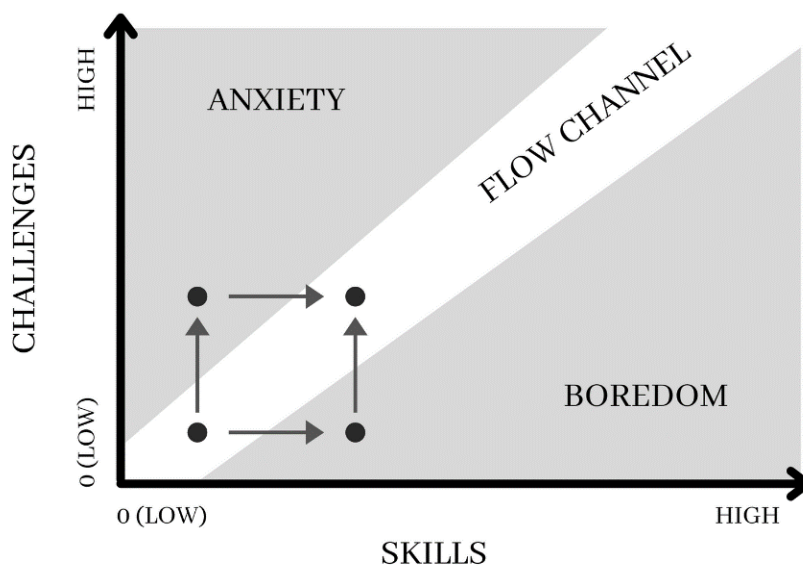


Figure 2. The first model of the flow state (Adapted from Csikszentmihalyi 1990, 74)

The state of flow has been described similar throughout groups with different cultural backgrounds, age, sex or social class. The activities to reach flow can vary from meditation to white-water rafting but the reasons why they are considered enjoyable stay relatively constant. In Pine and Gilmore’s (2019, xiv) Experience Realms model, one can

achieve a flow-like state by combining all the four elements (entertainment, educational, escapist, and esthetic) into the same experience and hitting the so-called sweet spot. Nakamura and Csikszentmihalyi (2009, 195–196) identified the following 6 characteristics that compound the feeling of flow:

1. Intense and focused concentration on the present moment
2. Merging of action and awareness
3. Loss of reflective self-consciousness
4. Sense of control
5. Distortion of temporal experience (e.g. losing track of time)
6. Experience of the activity is rewarding as such

The research on the topic has been heavily dominated by the balance between challenge and skills. This, however, only seems to be true when we are driven by a sense of achievement or we broaden our perspective on challenges and view them simply as opportunities for action, as Csikszentmihalyi did in his early research. Schiepe-Tiska and Engeser (2012, 89–92) introduced the concept of motives to argue the importance of personal needs in responding to an action opportunity. They propose that individuals choose their action based on three types of motivational patterns; achievement, affiliation-intimacy, and power. While each of these patterns varies in their incentives (Table 1), all of them have a chance to result in flow.

Table 1. Motive-specific incentives (Schiepe-Tiska & Engeser 2012, 91)

| <b>Motive</b>               | <b>Task-intrinsic incentive</b>                      | <b>Example</b>  |
|-----------------------------|--|---|
| Achievement motive          | Doing better for its own sake                        | Performing a difficult task, getting performance feedback |
| Affiliation–intimacy motive | Experiencing friendly, warm-hearted social contacts  | Chatting with friends, consoling a friend                 |
| Power motive                | Feeling important, strong, dominant, and influential | Dominating others in competitions, teaching               |

These motivational needs are implicit motives, unconscious motivational states that guide our attention and incentives. To whether we choose a specific action opportunity that may lead to an optimal experience, is also affected by our explicit motivations such as values and beliefs. These motive systems are independent, triggered by different stimuli and causing different reactions, but their interaction is important. While we may act solely on either one of these motive systems, ignoring the other may lead to an unsatisfying experience. The better harmony there is between implicit and explicit motives, the higher is the chance to reach the flow, and people with high affiliation-intimacy motive seek social

situations where they can interact with others, while it has been discovered that their implicit motives promote behaviour such as smiling, laughing, and listening, that endorse pleasant encounters (Schiepe-Tiska & Engeser 2012, 97). Individuals high in this motive engage in activities for social reasons like playing football with friends just for the sake of doing it together, when achievement motivated individual plays for practising or showcasing one's skills. Results of Walker's (2010, 16) study showed that a social flow, flow in group situations, fostered more intense enjoyment compared to solitary flow, and he argued that contagiousness of emotions may be the reason for the intensity of joy during and after flow. However, his study did not address the intensity of flow directly, thus there might be other than social factors in play. Fostering flow in groups is also influenced by group dynamics such as structure, trust, and inner relationships. (Schiepe-Tiska & Engeser 2012, 90–94, 96–100.)

Experiences that can offer an action opportunity to satisfy a need, have a chance to become an optimal experience, an experience marked with positive feelings and perhaps with higher chances to be remembered. As social flow is a more complex phenomenon affected by the social aspect, the next sub-chapter examines the elements that shape group experiences and encourage social cohesion in groups, which is the route to togetherness and optimal group experiences, the we-experiences.

### **2.1.3 Group experiences**

In many experiences, the social aspect plays a key role. Interacting and sharing an experience with others may be a primary motivator for purchasing a service besides contributing to the overall satisfaction and perceived value. Pine and Gilmore (2019, xvi) argue that experiences are highly personal, and that two people in the same place at the same time cannot have the same experience. This is very true, but the statement ignores the fact how a social context may influence our experience through emotions (Magee & Tiedens 2007, 1703). Imagine having the most fun time in an escape room but one person in the party starts to complain about the puzzles, decorations and the story. This is very likely affecting your own mood negatively, even if you are personally enjoying the experience, especially if the rest of the group starts to emphasise the negative feelings of this one member. The experience for all the participants is surely different, but at the same time, the group context cannot be ignored as a factor affecting the overall customer experience. Moreover, Van Kleef and Fischer (2015, 4–5) state that the more an individual identifies with a group, the more the evaluation of an experience is influenced by this aspect.

Activity theory is a model that considers activity, that is conscious and goal-directed, through a social context. The first model constructed by Vygotski and Leont'ev in the 1920s focused more on the individual aspect and it had three variable factors affecting the outcome; subject as the actor, object as the intended activity, and mediating artefacts as tools being used (Hashim & Jones 2014, 1–2). Leont'ev's view of activities was hierarchical; the activity itself as an action results from a motive, which evolves from a need (Kaptelinin 2011). Engeström (1987) later expanded the model (Figure 3) with three additional elements emphasizing the importance of the social aspect; rules as a set of conditions, division of labour as distribution of actions, and community as cohesion or togetherness. The activity theory has gained popularity in studying human-computer interactions, but Carlson et al. (2016, 7) suggest that the activity theory can be also used to explain hedonic service experiences in group contexts. They propose that in this context subject represents the consumer, artefacts the elements needed to facilitate the experience, object the desired outcome, and community the interactivity. For a further notion, they concluded that both communal and individual experiences are equally important factors in group experiences, and conditions of another do not eliminate the other's, but rather coexist, and that the activity theory was a useful tool for identifying these factors contributing to group experiences. (Carlson et al. 2016, 7–8, 30–32; Hashim & Jones 2014.)

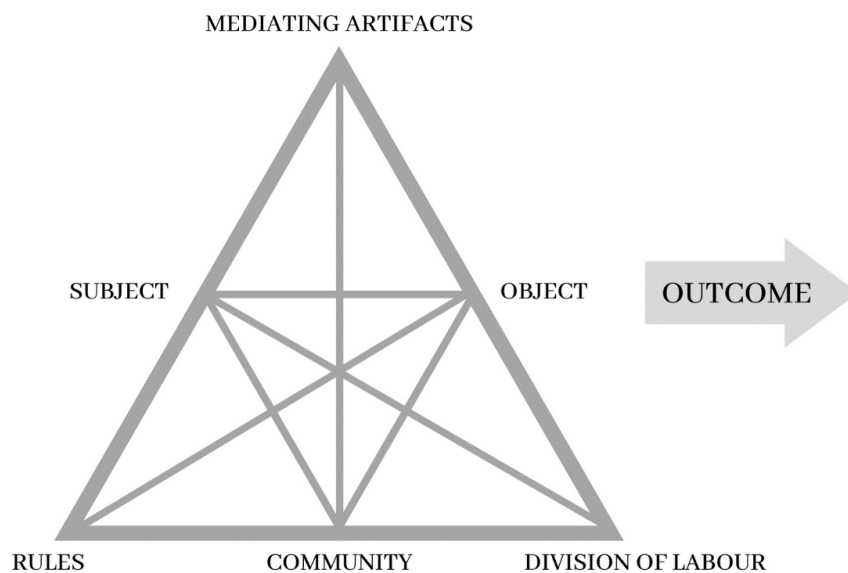


Figure 3. Second generation activity theory model (Adapted from Engeström 1987, 78)

In the activity system, we can further examine the relationships of elements affecting the outcome of shared experiences. Activity is the interaction of all the factors in the model

and each of their characteristics influence each other and the outcome. Subjects have needs that have to be met in the interaction with objects but objects also transform the activity of subjects and provide a motive for the action. The mediating artefacts are the tools, tangible or intangible, that helps in achieving the object. The community represents the other members of the group and the interaction within the activity. The social norms affect the relationship of the subject and community while the division of labour influences the outcome through the relation of community and object. As the importance of the elements is variable, Carlson et al. (2016) highlight the relationship between subject, object, artefacts and community to be the most crucial factors for the outcome in service settings. In a group context, when looking beyond an individual's experience within a social setting, the role of community is obviously an important additional factor for achieving a pleasant outcome. (Kaptelinin 2011.)

McMillan and Chavis (1986, 9) proposed criteria to define the communal feeling, which consists of four elements; membership, influence, integration and fulfilment of needs, and shared emotional connection. Membership is a feeling of belonging to an identified group where one feels accepted and the atmosphere is safe to share personal matters. Influence, the second element, is the confidence about one's possibility to affect the group decisions and the community. The more balanced the bipolar relationship of influence between the individuals and the rest of the group is, the more harmonious the community is. The third element, integration and fulfilment of needs is an achieved positive sense of togetherness, where the needs of each member are met simultaneously. The final element, shared emotional connection, is a bond between the members that is achieved with positive interaction, shared experiences and a sense of investment, such as intimacy, when one is comfortable to share personal matters with the group. All these elements contribute to the sense of group cohesiveness although their level of importance may vary between different types of social groups and contexts. (McMillan and Chavis 1986, 9–14.)

“Social cohesion refers to the extent of connectedness and solidarity among groups in society” and as a concept it is twofold, measuring both the level of belonging to a group and the relationships between its members (Manca 2014, 261). Sharing an experience with others can lead to a heightened feeling of experiencing together, also referred to as we-experience, where a sense of togetherness can be described as a “pleasant feeling of being united with other people in friendship and understanding” (Cambridge University Press 2021). Gerda Walther, a German philosopher, constituted a framework in the 1920s that addressed the generation of communal experiences that emphasizes the affective sense of togetherness or unification, that is not tied simply to embodied encounters. She found five crucial elements that jointly affect these experiences; intentional reciprocation



referring to how individuals influence each other, sharedness of intentional objects and contents as reaching a certain harmony within group's actions, knowledge of one another, unification or feeling of belonging-together, and reciprocation of the unification which highlights the need for a mutual feeling of togetherness. As not all communal experiences are we-experiences, Walther further argued that these shared experiences require some form of empathetic encounters, an understanding of the experience of others, to further become we-experiences. (Osler 2020, 574–575; Szanto 2018, 92–98.)

Group experiences are influenced strongly by social factors and furthermore, individual experiences are shaped by group behaviour. To understand this interplay better, it is crucial to understand emotions and their role in social interaction and human behaviour. The next chapter introduces emotions as a concept before deep diving into its further contribution to memorable group experiences.

## **2.2 Emotions**

We tend to think that emotions are just presentations of our mental state, often forgetting the fact that everything psychological is also physical. Emotions evolved in humans, alike in other animals, to guarantee our survival as a species. From the evolutionary aspect, emotions were born to protect us (fear), to take care of our basic needs (hunger), for defence (anger) and for securing offspring (love). As a social being, emotions have played an important role in shaping our communities and developing the diverse cultures as we know them by today (van Kleef et al. 2016). The importance of emotions in our everyday lives is still valid, though the focus has shifted from survival to social aspects and wellbeing. Discussion on the topic has dwelt since the times of ancient Greek and emotions, as a scientific concept, still has no broadly accepted definition due to a disagreement of disciplines (Mulligan & Scheher 2012, 345). The nature of emotions is ambiguous but for the sake of clarity, we will define them according to Cambridge University Press (2009, 179) as “a transient, neurophysiological response to a stimulus that excites a coordinated system of bodily and mental responses that inform us about our relationship to the stimulus and prepare us to deal with it in some way”.

Emotions are rapid, automatic responses to a specific sensation. In comparison to moods which are longer lasting states, emotions are short and more intense. Everything we experience through our senses is constantly being processed in our brains and when a stimulus reaches a certain threshold, an emotional response occurs. Emotional response can be an unconscious bodily reaction so subtle that it stays unnoticed even from the person themselves. Conscious responses can vary from uncontrolled reactions caused by

the sympathetic nervous system making our heart race to controlled facial expressions signalling our emotional state to others. On some occasions, an emotional state can be visible for others, while the person themselves fails to recognise it. This is due to lack of attention towards the emotion itself in a situation that forces our attention elsewhere, like e.g. when stepping on a snake, most of us would be so concentrated to secure an escape that we would not feel scared (it would hit us afterwards), even though bystanders could read the horror from our faces. To conclude, emotions can be conscious or unconscious, but without attention, an emotional experience does not occur. (Lewis 2008, 311–312.)

This chapter explores the effects of emotions and reviews relevant literature to form an understanding that is essential for studying the impact of emotions in the creation of memorable shared experiences. First, it presents two popular theories of the origins of emotions that will help us to classify them based on their qualities. Second, it focuses on the contribution of emotions in the formation of group experiences. And finally, it touches the surface of memory processing for gaining insights into how emotions may impact memorability. The findings of this chapter will help in planning the research design, and in analysing the data.

### **2.2.1 Classifying emotions**

We have come a long way from the 17<sup>th</sup> century when Descartes was shaping the idea of basic emotions that all other emotions arise from. Since then, many discrete emotion theorists have been arguing about the quality and amount of these basic emotions, but a mutual consensus is that these primary emotions are universal both in expressing and recognising them. The studies have failed to find exact locations for the basic emotions, but findings from neuroimaging studies support their existence as distinctive patterns of neural activation have been found for many of them. Perhaps the most widely accepted basic emotion theory is “The Big Six” which was introduced by Paul Ekman in 1969. Ekman’s research was based on universal recognition of facial expressions and they concluded six basic emotions; happiness, sadness, fear, surprise, anger and disgust. Later on, Ekman added one additional emotion to the group of universal emotions (Figure 4); contempt. On top of the basic emotions, there are more complex sub-emotions that are shaped by the individual’s perception and affected by situational and sociocultural aspects. (Piórkowska & Wrobel 2017, 1–3.)

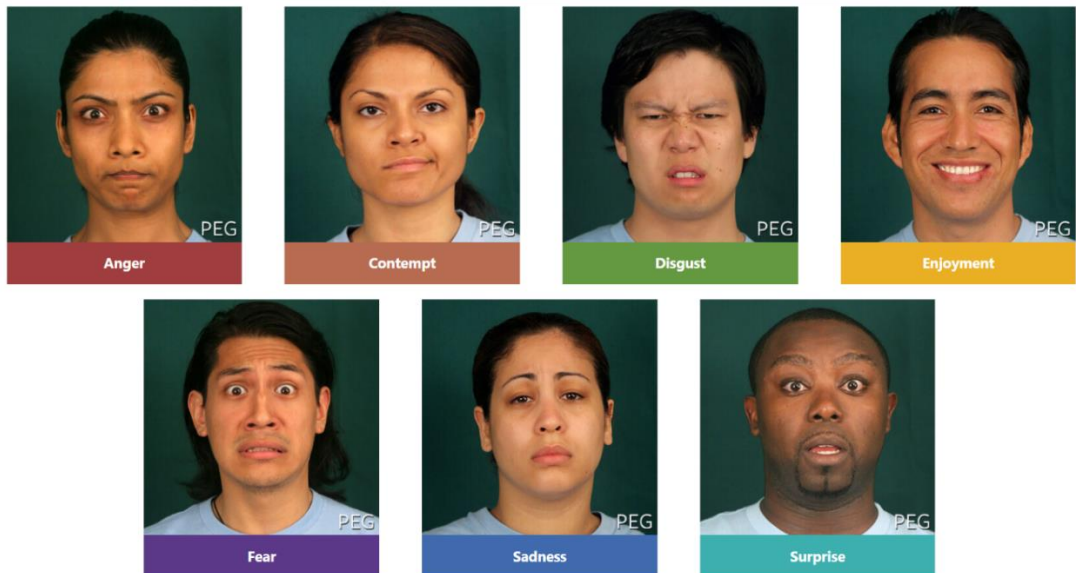


Figure 4. 7 Universal emotions (Paul Ekman Group, 2021)

Another view on the conceptualisation of emotions, the two-dimensional circumplex model (Figure 5), was introduced in 1980 by James Russell. In contrast to theories of basic emotions that find all emotions discrete, the circumplex model relies on a theory that all emotional states are variable combinations of affective valence and arousal. In the model, all emotions can be placed dimensionally around two axes; pleasantness (valence), and activation (arousal). In an example, a high arousal - high valence state would be excitement and low arousal – low valence boredom.

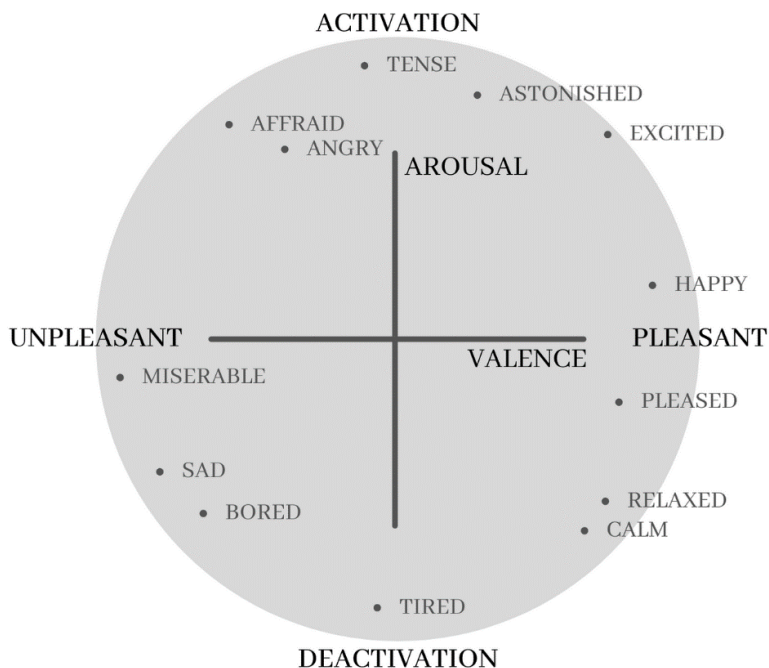


Figure 5. Circumplex model (Adapted from James Russell 1980)

Emotions are divided by their affective valence to positive or negative reactions but we have to note that sometimes feelings we see as contrary, are rather coexisting complementing each other. Also, labelling an emotion simply as negative or positive is not accurate because emotions are tied to a context; love can be painful and anger edifying. Anything from events to objects can hold emotional value and so fore affect our cognition and behaviour from conscious to the unconscious level (Lebrecht, Bar, Barret & Tarr 2012). Thus, when choosing a coffee cup, we hardly spend any time deciding which one to use but we are guided by our perception, which is influenced by affective valence, and pick a cup that is aesthetically most pleasing to us. In communicating, we signal our emotional stance to others via words and facial expressions. (Solomon 1998.)

Where affective valence indicates the value of an event, affective arousal states about the importance of it. Affective arousal measures the level of excitement or intensity caused by a stimulus, and it plays a role e.g. in decision making, the probability to act and how fast we react. While arousal may increase the level of our attention, it also tends to narrow the focus to a specific arousing object, decreasing our overall awareness of the environment (Storbeck & Clore 2008, 1836). Arousal holds information of the personal relevance of an event and studies have found evidence that especially high arousal levels are connected to better memory performance (Kensinger & Corkin 2004, 3310). However, a higher level of remembering is not equal to the accuracy of a memory but we can still conclude that we are more likely to remember events that hold an emotional significance to us. (Kensinger & Corkin 2004, 3310–3311; Storbeck & Clore 2008, 1824–1828.)

The two viewpoints of the basis of emotions, though different, helps in shaping an understanding of the variety of emotions. This thesis utilises Russell's circumplex model, and analyses emotions based on valence and arousal in the empirical part. The next sub-chapter examines the impact of emotions in group behaviour and their importance for social interaction, which will complement the already presented findings of group experiences.

### **2.2.2 Emotions shaping group experiences**

Emotions are more than just representations of our inner state but also a crucial part of communication between individuals and groups. Most emotional experiences actually happen in social settings, are triggered by social interaction, and are influenced by a group context (Magee & Tiedens 2007, 1703). People give cues of their intentions, traits and capabilities through their expressions and gestures and individuals who spend a lot of

time together, like couples in a relationship or a tight group of friends, tend to become similar in their emotions over time. This emotional convergence is believed to enhance cohesion, mutual understanding, and coordinated thoughts and actions, which in time strengthens the satisfaction of the individuals and longevity of the relationship. The so-called group emotion is a combination of an individual's emotions, attitudes, and other affective factors together with contextual factors, and Kelly and Barsade (2001, 116–118) note that it has a strong influence on a group's behaviour and cohesiveness. (Anderson, Keltner & John 2003, 1054–1055.)

If a person identifies with a group or community, they may get emotional on behalf of them even if they are not actively impacting the group's decisions and actions. This phenomenon is clearly visible e.g. within sports fans supporting their chosen teams and vividly living through their successes and failures as a part of the community. Emotions can shape an individual's perception even in a bystander's role as a group emotion can be visible to outsiders of a group. The level of cohesiveness in emotional expressions shape an outsider's view of a group's experience while especially positively valenced expressions indicate felt togetherness (Magee & Tiedens 2007, 1705–1707). Emotions provide important information for coordinating interactions in groups that reinforces behaviour that supports the group's functioning and helps in achieving common goals. As mentioned before, identifying with a group enhances collective emotions but also experiencing moments of shared emotions may strengthen the feeling of belongingness to a certain group, and heighten the likelihood for future interactions with emotionally similar individuals. (Van Kleef & Fischer 2015, 7–11.)

Besides identifying with a group, a level of felt similarity with the other members plays a role in the cohesiveness. When one identifies with a group (e.g. work team) but feels different from the other members, they tend to feel fewer collective emotions which may impact the group's cooperative functioning and performance. Social sharing is important for developing group emotions and individuals with a stronger need for acceptance, have a higher tendency to regulate their emotions based on the felt expectations as they might feel that it is socially beneficial for them. The importance of social sharing does vary between groups but usually it plays a bigger role in more intimate social groups such as a group of friends or family. Bakker (2005) found out in his research that the higher the level of flow was experienced by a music teacher, the higher the levels of flow were reported by their pupils, and this mechanism for contagious flow was connected to emotional contagion theory. While some emotional states may be more contagious than others, emotions that hold group relevant information, in contrast to affecting only one member of a group, seem to be adapted easier by others. (Van Kleef & Fischer 2015, 4–7.)

In sum, emotions shape group experiences as groups shape emotions. This bipolar relation plays a crucial role in shared experiences as emotions affect to the level of togetherness and group functioning, while the social aspect impacts the members on an individual level. The research on impacts of emotion in experiences has been focused more on individuals' but Anderson et al. (2003, 1066) suggest that the scope should be widened outside the individual level to capture the phenomenon as a whole, as the nature of emotions is often tied to social context. Moreover, Van Kleef and Fischer (2015, 12) highlight the need for understanding group emotions under a wider social context such as impacts of group norms, social classes or cultural aspects. To widen the theoretical aspect of memorable experiences, the next sub-chapter focuses on the role of emotions in memory processes, and presents insightful findings from the phenomenon.

### **2.2.3 Emotions affecting the memory process**

Memories are processed in three stages; encoding of information, storing it, and remembering (Broscha et al. 2013, 4). Emotions can affect all these stages and enhance the quantity and quality of our memories. As described in the preface of this chapter, an emotional experience occurs when attention is drawn to the current emotional state. This emotional experience may influence our perception and prioritisation of information during encoding, highlighting the content holding emotional value to us. During the storing process, a memory can be either strengthened or weakened, resulting in successful storing in the first case or in forgetting in the latter. In this stage, a memory with an emotional relevance may have an advantage over a neutral memory due to activation of the amygdala impacting hippocampal processes. This mechanism can affect the consolidation of a memory trace leading to heightened chances of remembering. (Broscha et al. 2013, 2–4.)

Findings of Dolcos et al. (2004) support the view that emotions enhance successful recollection of memories from the episodic memory and that the enhancing effect of emotions can last over decades. Kensinger and Schacter (2008, 602) conclude that recalling a memory is often linked to arousing events, where either a positive or negative stimulus has a higher probability to boost memory retrieval compared to a neutral stimulus. The valence itself does not seem to influence the process notably, but what seems to be more relevant, is the personal significance of an event that may activate the amygdala through arousal. This activation of the amygdala appears to be crucial for a quantitative memory boost. The quality of a memory refers to the vividness of it. Arousal may boost the vividness of a memory but the influence of valence on the quality is still

uncertain. Both negative and positive valence has been linked to heightened vividness of memories in different approaches. Even though it is evident that emotional memories have a higher tendency to be remembered than neutral memories (Kensinger & Corkin 2004, 3310), one has to note that neither quantity nor quality does not equal accuracy. On some occasions, emotions can contribute to greater detail in memories but several studies have noticed that emotions rather make us over-confident about remembering. (Kensinger & Schacter 2008, 601–611.)

The inaccuracy of emotional memories could be explained by the peak-end theory. The peak-end rule (Kahneman et al. 1993) suggests that remembered experiences are dominated by their peak moments (high arousal) and the emotional state at the ending point, disregarding the overall sum of feelings during an experience. Therefore, one would remember an event negatively if it is characterised by a peak negative feeling following an undesirable ending, even though the experience would have sparked positive feelings during it. If a nice day trip to a neighbouring city with friends would end with food poisoning or a car breaking down, the negative feelings would likely dominate the whole memory. Vice versa, a disappointing dinner in a restaurant could turn into a positive memory with a complimentary dessert and good customer service.

### **2.3 Constituents of memorable dining experiences**

This final part of the theoretical framework aims to connect the presented research from previous topics and further examine the factors that affect the level of felt togetherness and memorability in group experiences in the context of dining experiences, where a group is connected over spatial distance with video call technology. First, this chapter analyses the elements affecting memorability in such an experience. Second, it examines the role of emotions through a social dimension and how the interplay of these elements could lead to a heightened feeling of togetherness, and to a contagious flow between the group members. Then, the possibility to reach such optimal experience over physical distance is shortly argued before analysing the constituents of the experience against the activity theory model. At the end of the chapter, key conclusions from the literature review are drawn.

By further examining the framework of Cao et al. (2019), and reflecting it to the study case, we can identify the possible factors impacting the memorability of the experience. As their model was specifically designed to capture the essence of memorable dining experiences, it seemed like the most suitable option considering the objective of this thesis. Table 2 presents the active elements found within the experience. The presence of

the sensory element as engaging all the senses is evident, as multiple factors create varying sensory stimuli that support the immersion to the activity. The affect dimension, concerning moods and emotions, is one of the key elements in the experience, as it's built to connect individuals divided by a physical distance. The behavioural dimension highlights the elements in the experience that makes it memorable by engaging the participants, and in this case, the concept itself as a unique service offering, serves as this attraction. The social factor as the importance of social interactions and sharing the experience with others becomes fulfilled simply by the very nature of the event, gathering together for the sake of experiencing together. The input for the intellectual dimension comes through the social interaction, which provides a possibility to learn new about the lives of each other by catching up over the dinner.

Table 2. A formative measurement model for MDE (Adapted from Cao et al. 2019)

| <b>MDE indicator</b> | <b>Elements in a technology-enhanced dining experience</b>  |
|----------------------|---|
| Sensory              | Food and beverages, video call input, background music, smells, aesthetics, textures of items and furniture |
| Affect               | Reunion of the participants   |
| Behavioural          | The uniqueness of the service setting   |
| Social               | Sharing the experience and connecting with friends or family  |
| Intellectual         | Learning new via catching up with others  |

Following the suggestion of Bastiaansen et al. (2019) to focus on the role of emotions as the building blocks for memorable experiences, this thesis will emphasize the role of affect and social dimensions. When examining memorable experiences in a group context, the social dimension is evidently as crucial factor as the emotions. Though the other dimensions are no further addressed, this is not due to an opinion that they would be irrelevant, but simply due to the scope of this research. However, one has to note that sensory inputs play a major role in the formation of emotional experiences as only sensations reaching a certain threshold can cause reactions that result in emotions. So fore without these inputs, the dimension of affect cannot impact memorability because no emotional arousal occurs, which seem to be the key for the activation of the amygdala, and to the enhancing effect of emotions in memory processes.

As highlighted on few occasions, most emotional experiences happen in a social context, so therefore a shared dining experience could serve as a natural setting for creating memorable experiences. Based on the motivational model of Schiepe-Tiska and Engeser (2012, 91) that was presented in the chapter "optimal experiences", one could reach a flow state during a group dining experience by affiliation-intimacy motive, where



experiencing friendly encounters and engaging in conversation with friends would be the motivating factor. Here, an implicit motive, caused by a need for a friendly social contact, recognises and responds to an action opportunity. This hierarchical view on initiates is in line with Leont'ev's idea, that needs, motives and actions have a causal relation leading to the pursuance of a desired outcome. As a casual dinner with friends is a social situation, the participants are likely joining in exactly because of the social opportunities it provides. Social sharing, which happens especially in intimate groups, nurtures a sense of we-experience. It is also an important mechanism for group emotions, that further enhances the feeling of belonging and identifying with a group through emotional contagiousness. Bakker (2005) argued that emotional contagiousness could be the very reason for contagious flow, a situation where flow is fostered in groups. Walker (2010, 26) later recognised the following characteristics presented in Table 3, that set social and solitary flow apart.

Table 3. Indicators for social and solitary flow (Adapted from Walker 2010, 26)

| <b>Indicator</b>   | <b>Social flow</b> | <b>Solitary flow</b> |
|--|--------------------|----------------------|
| High absorption & engagement with the task                               | x                  | x                    |
| High attention to group members  | x                  |                      |
| Sense of time lost   | x                  | x                    |
| Less awareness of self   | x                  | x                    |
| Surrender of self to the group   | x                  |                      |
| Emotional communication during group work                                | x                  |                      |
| Emotional contagion within the group and observers external the group    | x                  |                      |
| Joy, elation and enthusiasm felt upon the completion of a task           |                    | x                    |
| Joy, elation and enthusiasm felt and shared throughout group performance | x                  |                      |
| Builds meaning and a sense of purpose                                    | x                  | x                    |
| A desire to repeat the experience  | x                  | x                    |
| Rituals may be established to institutionalize social flow               | x                  |                      |

In a social context such as a shared dinner, emotions seem to play a bigger role compared to solitary flow, where the activity solely seem to result in joy. Whereas in social flow, joy and positive feelings prosper throughout the experience. Results of Walker's (2010, 16) study showed that social flow also fostered more intense enjoyment and he argues that emotional contagiousness may affect the intensity of joy during and after flow.

However, his study did not address the intensity of flow directly, so fore there might be other than social factors in play. Despite that, social flow is a more complex phenomenon due to the social aspect, and besides contextual factors, it is also influenced by group dynamics such as structure, trust, and inner relationships (Schiepe-Tiska & Engeser 2012, 99). Social sharing and emotional contagiousness were differentiating factors between the individual and group flow situations. These phenomena emphasize the formation of group emotion and feeling on behalf of others, so fore they could be the key factors also to togetherness, as according to Walther (Szanto 2018, 98), empathic encounters set we-experiences apart from ordinary communal experiences. Noy, Levit-Binun and Golland (2015, 11–12) state that flow and togetherness are similar states that share many of their key features, and furthermore their study found evidence that increased alignment of cardiovascular activity between the participants could be an indicator for reaching this state.

The underlying question is, that whether these conditions can be met in a digitally enhanced service setting where a group is separated by a physical distance. A common thought is that online and offline encounters are crucially different, but due to the internet and social media, people already spend a notable amount of time interacting with each other online, and many describe the feeling of togetherness when talking of experiences in online environments. Many online interactions happen with people who are already within one's social network, so perhaps online and offline encounters should simply be viewed as different ways of communicating, both enriching the overall social experience. Based on Walther's findings presented in the chapter "group experiences", a feeling of togetherness can be achieved without face-to-face contact. Building on top of Walther's theory, Osler (2020, 585) argues that as the feeling of togetherness relates to affective feeling rather than experiencing something in the same place at the same time, a feeling of togetherness can happen online over spatial distance. Feeling togetherness online can happen through common objectives where a group of people identify as a "we" because of shared interests, e.g. when belonging to a same church, thriving similar political agendas or gathering together to play a specific game. Instead of objectual togetherness, togetherness can arise from a past shared experience which binds individuals together as a we. Achieving a sense of togetherness during a shared, technology-enhanced dinner experience builds on this notion, that when a sense of togetherness and belonging becomes sustained, the method of interacting will not diminish this feeling. Thus, technology may offer new ways of interacting with others, it will not change the social need for belonging and sharing with others. (Osler 2020, 570–573, 577–580.)

Schiepe-Tiska and Engeser (2012, 95) highlight, that “to review flow as a motivational state emerges from a person x situation interaction”. This interaction can be found also from the activity theory where the activity as a whole is based on fulfilling a need of a subject in pursuance of the object. Within the activity theory model, the experience can be further analysed for other factors that contribute to the outcome in group situations. The adaptation of the model (Figure 6) showcases the activity system in a hedonistic service experience context, as suggested by Carlson et al. (2016, 7). Here, the subject represents the consumer that has a need for re-connecting with friends. The object, desired outcome as doing something together with friends, evokes the motive by providing an action opportunity that can satisfy this need. By responding to this action opportunity, the object transforms the activity. The artefacts facilitate the experience, and ideally support achieving the desired outcome. The mediating artefacts can be viewed as the service setting, possibly the most influential factor that the service provider can affect to. By setting the stage right, the service provider can optimise the environment for the desired outcome. The community represents the interaction with the other members of the group, which is influenced by the social norms. When reflecting back to the MDE model, the social dimension happens through the interaction between the community and the subject, while it can become fulfilled by reaching the object. Division of labour highlights the roles within the community in achieving the desired outcome as well as how the desired outcome may shape the community. Activity is the interaction of all the factors in the model and each of their characteristics influence each other and the outcome. Action opportunity happens in the interaction of subject and object, but in the context of a social flow, the community comes into play. In a dining experience, the community is needed both in the sense of being a counterpart for sharing the experience, as for fulfilling the need for a social encounter.

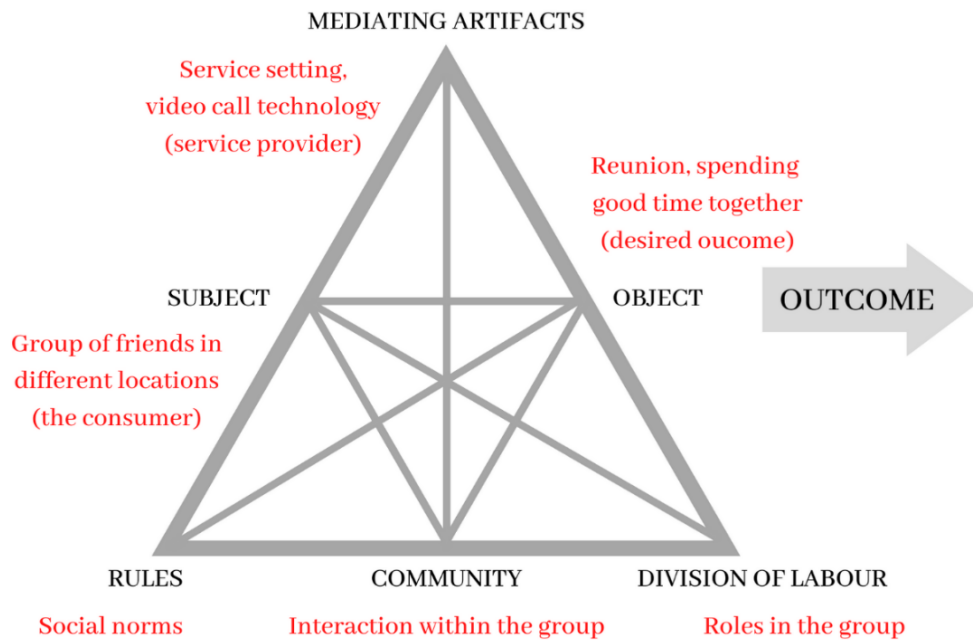


Figure 6. Activity theory model for the research case

Narrowing back to the objective of the thesis, to understand the special conditions affecting the memorability of group experiences through a sense of togetherness, the empirical part will focus on the role of emotions and social aspects. As emotions shape group experiences while groups shape individual's emotions, the connection of the two dimensions is evident in the context of group experiences. By understanding this interplay, we can better understand the underlying phenomenon, we-experiences, and its special characteristics regarding memorability of a dining experience. As a conclusion from the literature view, this thesis wants to highlight three aspects in the creation of such experiences. First, the notion that most emotional experiences happen in a social context, and that emotions are key contributors to group emotions, which enhance cohesion and nurture the feeling of togetherness. Second, the observation that many of the dining experiences become memorable because of the social aspect, as who is the experience shared with. And third, the takeaway that emotions may enhance memory processes. So fore, both emotions and social aspect, and their interplay, arguably play a key role in the creation of shared memorable dining experiences.

### **3 Research methodology**

The purpose of the thesis was to examine the factors that affect the level of felt togetherness and memorability in group experiences. A special interest was taken to whether these conditions can be met over spatial distance in a technology-enhanced dinner setting. As highlighted before, the reliability of self-reports is questionable due to errors in the human mind or unwillingness to report accurately, so fore this research utilised psychophysiological measurements to complement introspection with biosignals. With the insights from bodily activity, the phenomena and interplay of elements can be examined deeper. Emotions may be the key construct to memorable experiences (Bastiaansen et al. 2019), but based on the presented findings in the literature review, one can't ignore the impact of the social dimension in the context of hedonistic group experiences. Thus, the research focused on understanding the roles of emotions and social aspect, to assess the memorability of experiences.

The main research question was: Can a sense of togetherness contribute to the memorability of a dining experience over spatial distance?

Sub-question 1: Can a feeling of togetherness be achieved over spatial distance?

Sub-question 2: Does synchronisation of biosignals equate to the level of felt togetherness?

Sub-question 3: Does the measured intensity of emotions correspond to the subjective memory?

#### **3.1 Research design**

To seek answers to the research questions, a dual set up was required. As the aim was to measure reactions in a social context but over physical distance, another data collection point was set up in Haaga-Helia's Haaga campus, another in Pasila campus (Figure 7). All the data were collected in one session, harnessing each respondent with biometric sensors simultaneously. The event was also filmed to post-analyse facial expressions. Besides the technology required for the data gathering, an additional computer was needed for a video call connection. The set-up itself was a mock-up of a type of dining experience where a group would be dining together but separated by distance. The rooms were made as similar as possible concerning all the props, service offerings and other elements.

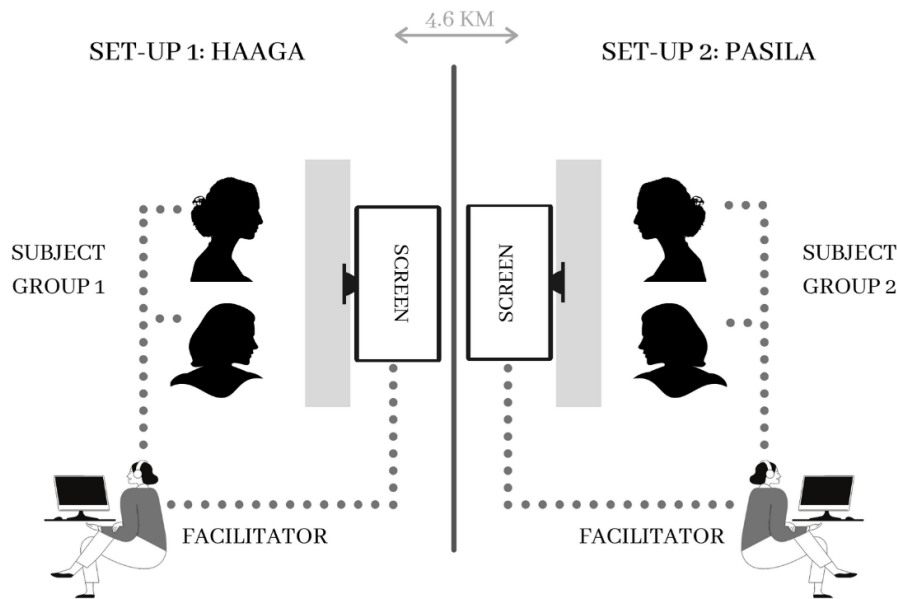


Figure 7. Set-up for the data collection

Identical conditions between the set-ups were important for ensuring consistent data, as any changes could impact participants in one room, but leaving it impossible to identify those variables from the data afterwards. The identical set-up also served the purpose of the experience, creating a shared experience over a physical distance. During the physiological data gathering, the conditions were also made as similar as possible than in a real-world situation in a restaurant, but without compromising the data quality. In a controlled environment, a private classroom, distractions could be minimised while a decent level of comfort achieved. The only task for the participants was to socialize with others as in any normal situation with a group. As the focus of the research was on a psychological phenomenon happening in a social context, the stimulus was provided by the other group members through interaction.

Crafting the research design is vulnerable to flaws unless planned carefully. According to Ryan (2007, 13–23), a poor design will result in false outcomes and there are many factors contributing to failure such as vague research question, irrelevant variables, research biases, misleading survey questions, missing data and failure to block distractions, among others, unless sufficiently addressed in the designing phase. A failure to capture these flaws will affect directly the validity of the research. Besides careful planning during the early stages, the set up for the data collection should be tested before the actual study. The testing is required in order to guarantee a proficient collection of adequate data. During the testing, the set up can be optimised (e.g. lighting, camera angle), technical functionality, connections and clarity of instructions checked, and

sufficiency of chosen signals ensured. The pre-testing was done two weeks before the actual data collection, while the set-up was still checked on the experiment day before the arrival of the participants.

### **3.1.1 Data collection**

The data collection was three-phased; In phase one the participants filled in a small questionnaire upon arrival; in phase two, physiological data were collected and the participants were being observed while engaging in the experience, which was also being recorded; phase three was a group interview. The first questionnaire (Appendix 1) addressed the motivations and dynamics of the group, and the answer options followed a five-point Likert scale, which is a commonly used measure in psychological research (Paavilainen 2014, 40). The physiological data in the second phase combined sensors that measure heart rate variability (HRV) and galvanic skin response (GSR). Facial expressions were analysed both by a computer software and by human observation. The interview in the second phase of data collection was semi-structured, both searching answers for set questions, but also giving room to explore potential notions. The beginning of the interview (Appendix 2) reflected back to the experience to gather data of the subjective feelings as well as memories. In the latter part of the interview, the participants were shown chosen clips from the video recording, and they had to individually rate the level of togetherness they felt during that moment on a scale from 1 to 5 (Appendix 3). Video elicitation was used as a basis for the reflection, as it stimulates the recalling and enables the participants to re-visit the chosen moments (Jewitt 2012). The clips were a combination of moments where mutual high arousal-positive valence was detected across the participants, as well as neutral moments for comparison.

HRV and GSR were measured with Shimmer3 GSR+ device unit which is comparable with Shimmer optical pulse probe, that measures and translates PPG (photoplethysmogram) to heart rate measurements. Two GSR electrodes and the optical pulse sensor were placed to each participant's fingers and connected to an amplifier attached to their wrist. The amplifier sends the data wirelessly to the iMotions platform, which was the software used to handle the data. iMotions have been used for data gathering in over 350 peer-reviewed research papers (iMotions 2020). HRV and GSR are both used to measure the arousal level of the participants which reflects the personal relevance and intensity of the emotions. Measuring the emotional arousal was crucial for analysing the possible connection of emotions and enhanced remembering. Besides the biometric data, the participants were asked to reflect on the intensity of their emotions through introspection during the interview. The facial expressions were analysed from a

video input and via observation to detect the emotional valence. The software-based analysis utilises Affectiva AFFDEX facial expression algorithm, which results are comparable with EMG findings (Kulke, Feyerabend & Schacht 2020). Macro expressions are short expressions that are visible also for a human eye, and so fore they could be observed also by the facilitator during the experimental part. The valence was measured to identify moments of cohesiveness, as cohesion in emotional expressions can indicate the felt togetherness, as stated before. The interaction between the two groups was organised through a video call in Zoom and the call was recorded for the post-analysis purposes.

### **3.1.2 Participants**

Because of the nature of this research, being a pilot study, the sample was remarkably smaller than advisable for executing a similar full-scale research. The sample size was also cut down more to ensure the safety of the participants due to the ongoing Corona pandemic. This affects directly to the validity of this study but nevertheless, it provides adequate results for guiding the focus of the main research project with attention to necessary improvements and adjustments. The sample group was formed from 4 participants (n=4), with the only criteria being that all the participants identified themselves as members of this group, they have known each other longer than one year, and that they see each other frequently in their free time. The participants were students, recruited from the same campus where this research was conducted through an open call. As the study required a group who already shares a mutual feeling of belongingness, creating a pool of volunteers and randomly create a subject group from them was not an option. The chosen subject group were the first group that fit the set criteria.

### **3.1.3 Procedure**

The procedure for data collection was as follows. Upon arriving the participants were given a written consent document that clarifies the purpose of the study, and provides an explanation of the experiment's timeline, methods, and data handling procedures together with the questionnaire. The participants were also given an opportunity to ask questions before signing the document. Next, the participants were seated and the biometric sensors placed, while further advising the participants of their role. The quality of the data was checked and baseline measurements collected before the actual experiment. During the experiment, the experience could flow freely on its natural phase, but without any interactions with outsiders of the subject group, including the facilitators. The experience



was stripped of the service aspect on purpose, as any outside interactions could have interfered with the main focus, understanding the intergroup relations. Also, the dinner aspect was downsized due to the difficulty and workload of organising an actual dinner in laboratory conditions, and participants were only offered snacks and beverages during the experiment. The experiment lasted 30 minutes and the video call connection was set to end automatically. The participants were advised prior, that this signals the ending of the experimental part. The biometric sensors were removed and the participants were gathered for a focus group interview, which lasted another 30 minutes. Once the interview was finished, the subject persons had a chance to ask more questions relating to the research.

### **3.1.4 Data analyses**

The data was a combination of physiological data from biometric sensors, self-reports (through questionnaire and interviews), and observations of the participants. The biometric data was collected and raw data analysed with iMotions software, which was then exported to be further analysed statistically. As bodily reactions vary between individuals, the software aggregates all the data by analysing each respondent's data first individually before combining it all together. After aggregation, we can search for similarities from the data between all the subject persons. For detecting valence, the threshold values were set to 10 to capture the mildest expressions with a time bin value of 5000ms. For arousal, the data was broken down to intervals of 5000ms with an overlap value of 1000ms, and detecting peaks with an onset threshold value of  $0.01\mu\text{s}$ , minimum amplitude threshold value of  $0.005\mu\text{s}$ , and signal jump threshold value of  $0.1\mu\text{s}$ . The amplitude of the arousal was not further assessed but the results were simply 1 (yes) or 0 (no) on given intervals. Analysing the HRV was based on detecting changes within momentary windows of 1s. Each research question was analysed by comparing self-reported and biometric data together, as none of the measurements alone are sufficient to provide reliable results.

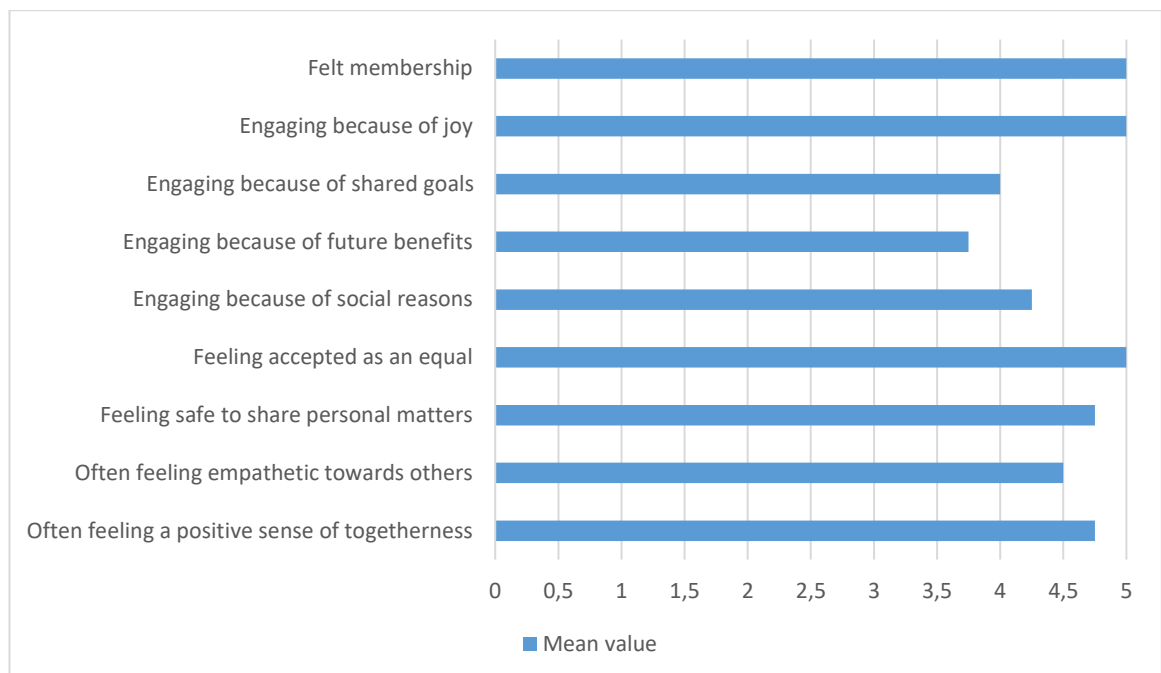
Togetherness was measured with both subjective experiences and synchronisation of biosignals. As Noy et al. (2015, 11) made a remark on the similarity of the feeling of togetherness and social flow, and found a positive correlation between felt togetherness and alignment of heart rates, while Walker (2010, 17) proposed that consistency of arousal could signal of social flow, this thesis followed these assumptions and examined togetherness and social flow without making a distinction between the concepts. The questionnaire and interview questions focused on the common features of these phenomena. During the latter part of the interview, the participants were shown clips from

the recording and they were asked to individually rate their level of felt togetherness during these moments. All the self-reported findings among with facilitators observations were then reflected to the biometric data to search for similarities in bodily reactions. Peaks in the biometric data with a distance no higher than 5s between the participants were taken into account when analysing the cohesiveness. Memorability was assessed in the interview by asking the participants to reflect on the experience and share their memories. These subjective memories were then time-stamped from the experiment capture and reflected against the detected GSR peaks for comparison.

### 3.2 Results

The pre-questionnaire was designed to understand the group dynamics, group cohesiveness and motivations for engaging in an activity such as a shared dining experience. The participants rated the statements with a scale from 1 (strongly disagree) to 5 (strongly agree). The results (Table 4) reveal that the main motivation for engaging with each other was the joy it brings. The four elements (membership, influence, integration and fulfilment of needs, and shared emotional connection) McMillan and Chavis (1986) identified to be the criteria for the communal feeling were fulfilled, along with Walther's requirement on empathetic encounters, which set we-experiences apart from regular communal experiences.

Table 4. Group cohesiveness and motivation



The main reason for engaging in an activity such as eating out within this group was interaction and social reasons. When analysing the fulfilment of these needs in a situation where the group is separated by physical distance, the conclusion was that it is possible, but a successful experience was somewhat bound to additional conditions, such as integrating an extra activity into the experience, in comparison that dining out itself was enough in normal circumstances. One respondent noted that even though the needs could be filled, the experience would not still be the same. When further analysing factors affecting a successful outcome, as having a good time when dining out, the people and interaction were seen as the most crucial elements, before food, service, environment, or other factors.

Sub-question 1 examined the possibility for a sense of togetherness to occur over physical distance. As argued in the theoretical framework, togetherness and social flow share many attributes, thus the thesis approached the question by analysing both the felt subjective experience of togetherness and recognisable characteristics of social flow. The participants reported the following characteristics to have happen during the experiment (Table 5). Indicator 7 (see table below), emotional contagion within the group and observers external the group, was reported through participant observation, while the rest was revealed in the interview.

Table 5. Identified indicators for social flow

| <b>Indicators of social flow</b>  | <b>Reported</b> |
|---|-----------------|
| 1. High absorption & engagement with the task                               | x               |
| 2. High attention to group members  | x               |
| 3. Sense of time lost   | x               |
| 4. Less awareness of self   | x               |
| 5. Surrender of self to the group   | x               |
| 6. Emotional communication during group work                                | x               |
| 7. Emotional contagion within the group and observers external the group    | x               |
| 8. Joy, elation and enthusiasm felt and shared throughout group performance | x               |
| 9. Builds meaning and a sense of purpose                                    |                 |
| 10. A desire to repeat the experience                                       |                 |
| 11. Rituals may be established to institutionalize social flow              |                 |

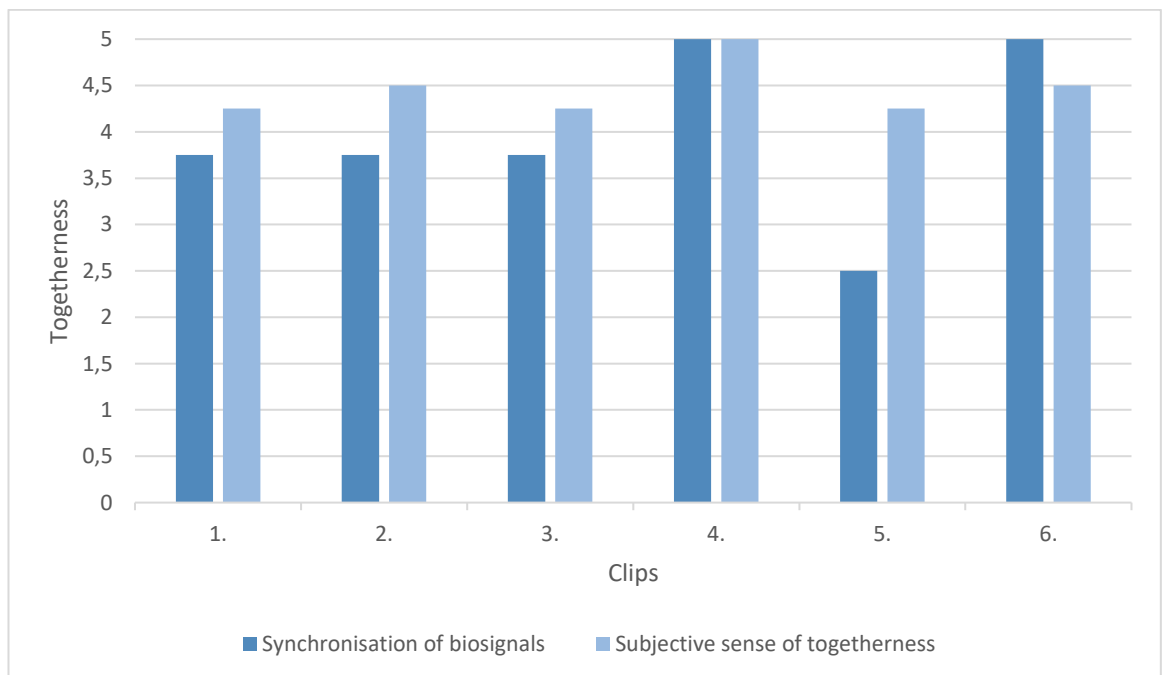
From indicators of social flow, 8 out of 11 were reported to be true in the experiment. Indicator 9 did not fulfil, but participants described the experience to be similar to usual

gatherings with the group, nothing less or more than the ordinary. Indicators 10 and 11 were difficult to approach in the interview due to the setting of the experiment, which was rather laboratory-like conditions far from an ecologically valid situation, and so fore no adequate results were captured to measure them.

The level of togetherness was also rated on a scale from 1-5 by assessing captures from the experiment recording. The participants were shown six short clips (15-20s) from the recording, which were chosen based on participant observation on group emotion showcasing positively valenced facial expressions, as that can indicate the felt togetherness. For comparison, the chosen clips had both positively valenced and neutral moments. Table 6 presents the data both from the subjective experience and from the biometric measurements, as sub-question 2 examined the relation of subjective feeling of togetherness and synchronisation of biosignals. Because the two variables were scaled differently, they were both converted to a scale of 0-5, 5 being the maximum, with the following formula:

$$Y = \left( \frac{X - X_{min}}{X_{range}} \right) n$$

Table 6. Togetherness during the experiment



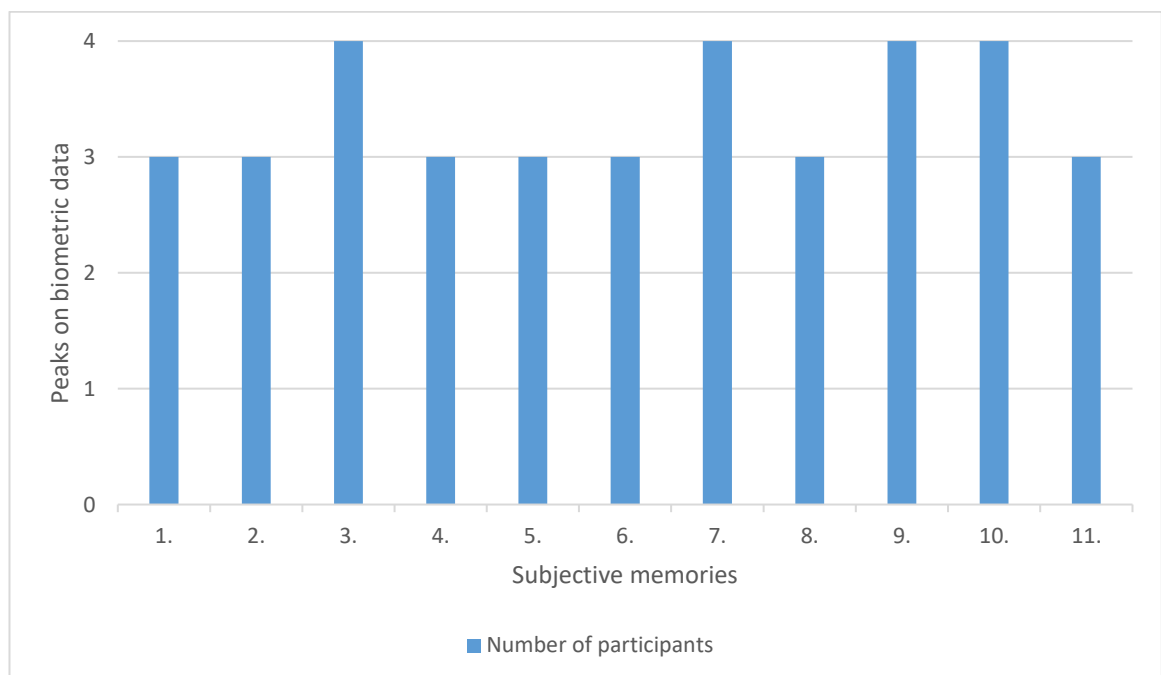
From the clips, 1 and 5 represented a neutral moment, while clips 2,3,4, and 6 were observed to be positively valenced. The subjective feeling of togetherness was rated above four in all the clips, nevertheless the observed valence. The cohesiveness of biosignals followed closely the subjective feelings, except in clip 5, which was another one

of the neutral clips. In clips 4 and 6, the synchronisation of biosignals was equal to or stronger than the subjective feeling. The correlation of the variables was  $r=0,92$ , including only the cohesive positively valenced moments. Despite the small sample size, a strong positive correlation between the measured variables suggests that a connection between the variables is possible. The correlation was calculated using the Pearson correlation coefficient:

$$r = \frac{\Sigma(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\Sigma(x_i - \bar{x})^2 \Sigma(y_i - \bar{y})^2}}$$

Sub-question 3 was searching for a possible relation between the subjective memory and emotional arousal. Based on the interview, 18 subjective memories were recorded. From these, 13 could be categorized as moments during the data gathering while the rest were referring to unmeasurable objects without a clear timestamp, and so fore they could not be analysed against the biometric data. From the 13 moments, two were further eliminated from the analysis because the moments could not be pinpointed to a specific time slot. The remaining 11 subjective memories were then compared with the biometric data to find possible peaks in arousal during their occurrence (Table 7).

Table 7. Comparison of biometric data peaks against subjective memories



The pillars represent the number of participants who had arousal peaks during the determined moments on a scale of 0-4, 4 being the maximum. Each subjective memory had peaks in the biometric data across three participants in minimum. In four moments out of 11 (3,7,9,10), all the participants had peaks during them. However, the data used for

the analysis did not hold information of the amplitude nor length of the peaks, but it simply measured the alterations in physical arousal compared to the individual baseline recordings.

### **3.3 Conclusions**

By analysing the data, it seems that a feeling of togetherness can be achieved over spatial distance. The felt togetherness was relatively high and constant, regardless of the observed valence during the moments. From this, we could conclude that a group that has achieved a sense of togetherness already, may not be as sensitive to any situational changes, but the level of togetherness remains relatively fixed. The participants described the experience to be similar to the group's usual gatherings. This may be due to the group being already accustomed to interacting with each other online, and the results of felt togetherness could be different within a group with no similar experience. By analysing the results for the existence of social flow, most of the characteristics became fulfilled. This indicates that social flow may be achieved in technologically enhanced situations where a physical distance separates the group. However, the occurrence of such optimal group experience, and we-experiences overall, is clearly bound to conditions, which may alter between groups due to group dynamics, needs, motivations, and being accustomed to the use of such technology.

The findings from the biometric data follow the trend of subjective feeling of togetherness relatively well. The subjective feeling remained on a similar level throughout the clips but the only clip with a greater variation in the results compared to biometric data, was clip number 5. Clip 5 was a neutrally rated clip, but however, the participants still reported feeling a similar sense of togetherness as during the other clips. When analysing the biometric data against this finding, perhaps the drop in the cohesiveness of biometric data during clip 5 was simply due to the nature of the moment, which was labelled neutral, and so far no arousing emotions occurred. Because the analysis of cohesiveness in the biometric data was based on detecting changes in arousal within a maximum 0.5s difference between participants, the analysing method failed to detect possible synchronisation of biosignals in non-arousing data. In the case of this pilot study, the correlation of the variables, cohesiveness of biosignals and the subjective experience, was  $r=0,92$ . The correlation so far was strong, but one has to note that the amount of respondents is not sufficient to actually analyse nor make conclusions of the connection between the variables. The results however suggest that a relationship is possible, but further research is needed to verify and investigate its quality deeper.

Results for sub-question 3 were not adequate to draw any conclusions of the relation between subjective memory and emotional arousal. Though peaks in the biometric data could be detected on the examined moments based on the participants' self-reporting, there were too many uncontrolled variables. First, most of the subjective memories were impossible to narrow down into an exact time of occurrence, leaving too much room for speculation of the peak moment relating to the memory. Second, because of the uncertainty of these moments, the cause of the data peaks cannot be concluded. Also, without further addressing the qualities of the peaks, like amplitude, it is impossible to understand the relation between the peaks and personal relevance linked to the occurred emotion, which after all, seems to be the key to the possible memory-enhancing mechanism through the amygdala activation. However, with further control over the conditions, and comparison between subject groups, one might get more sufficient data to examine the phenomenon.

To answer the main research question, "can a sense of togetherness contribute to the memorability of a dining experience over spatial distance", one has to first conclude if a sense of togetherness can occur over spatial distance. Based on the results of this study, it is possible, yet bound to conditions such as group dynamics and motivations. Whether togetherness can contribute to a memorability of an experience, is impossible to answer with this amount of data. However, the comparison of physiological arousal and subjective sense of togetherness can give valuable insights into this phenomenon, if the quality of the biometric data is further assessed and adjusted. As arousal has been linked to a memory-enhancing effect under some conditions, the social nature of emotions could further enhance the memorability of we-experiences, as these experiences may have a higher possibility to spark, boost, and transmit emotions within the group.

## **4 Discussion**

This study was set to investigate the relation of togetherness and memorability in a social context, and over physical distance. Togetherness and memorability were thoroughly assessed in the theoretical framework from two perspectives; experiences, as what affects the memorability of an experience, and how social context affects experiencing in groups; and emotions, as how emotions may impact memorability, and how emotions shape group behaviour. The theoretical framework concluded that both emotions and social aspect play a key role in shaping memorable experiences in the context of group experiences, and neither should be overlooked by the other, as their interplay is evidently strong. This notion further justifies the research methods and the use of bodily measuring, as studying emotions simply on the basis of introspection is deficient, as argued before.

The aims of the thesis, to design and execute a pilot study that can be later used as a base for a study design of a full-scale research on the same topic, and that the thesis was able to collect valid data which could be used to study the questions in hand, were achieved. As a pilot study, the thesis fulfilled its purpose by paving the way for a future study case with necessary improvement suggestions. The second aim was achieved to a certain degree, as the thesis was able to gather sufficient data to study part of the research questions. However, even though the focus was on memorable shared dining experiences over spatial distance, the findings of the study are somewhat scalable to dining and group experiences in other situations, as well as to memorable experiences. The project was also a great contribution to the author's knowledge and know-how.

### **4.1 Key contributions**

The results support the view that we-experiences and a sense of togetherness can occur over physical distance, although the conditions may vary between groups. Interestingly, the sense of togetherness remained relatively fixed nevertheless the observed valence nor cohesion within the group, which hints that once sustained, the feeling of being together is not necessarily sensitive to the means of communication nor situational changes. The results were aligned with the findings presented in the theoretical part, that togetherness rather relates to the affective feeling of experiencing together than actually physically experiencing together in a same place. Although a notion was made that the online experience is still not the same as a real face-to-face gathering, one has to consider that is the different feeling irrelevant, if a sense of togetherness is still achieved. Among these findings, many elements of social flow were identified during the experiment,



which supports the argument of Noy et al. (2015) that social flow and togetherness are similar phenomena.

Trying to examine the connection of emotions and memorable experiences failed, partially due to limitation in research design, and to the lack of a control group, and to the limited possibilities of cross-referencing the results between the groups. However, the study's theoretical contribution to the topic was fruitful, complimenting existing theories within the hospitality field with research findings from psychology and neuroscience. The enhancing effect of emotions in memory is arguably true based on the wide amount of research reviewed, and this factor should be further acknowledged and studied in the context of memorable experiences.

The main research question remains unanswered, but the theoretical findings support the view that more emotions, in quantity and quality, could be fostered under social context. A group that is high in affiliation–intimacy motive, have a chance to enter a cohesive state of flow during a shared experience like a joint dinner, where the group's cohesion further encourages the formation of group emotion and a strong sense of togetherness. This meaningful state of being together, as being an event holding personal significance, might indeed be the key for enhanced remembering in the context of group experiences. Carlson et al. (2016) highlighted four factors (subject, object, artefacts, and community) of activity theory to be the most crucial ones in the context of hedonistic service experiences. Even though acknowledging the role of artefacts as a factor contributing to the outcome, it had little to no impact when the desired outcome was a heightened sense of being together, but it was merely providing the stage and means of communication. The author would rather want to highlight the importance of subject, object, community, and rules, if we want to understand group experiences under a wider social umbrella such as culture and social classes, as suggested by Van Kleef & Fischer (2015). Even though tied to group dynamics and social aspect, this elevated feeling of togetherness should be nurtured in experiences, and addressed more closely when designing the service offerings.

#### **4.2 Reliability and validity of the research**

The research methods were recorded carefully to detail and the means of the analysis presented along with attached documents of research questions and surveys. So fore, the research is reliable. Due to the insufficient amount of data, the internal validity of the results is low. Even so, the methods for investigating togetherness in groups were proven valid, with a notion of further adjusting the conditions and finetuning the analysis. When it

comes to the methods of studying memorability, there were a large amount of uncontrolled variables, which made the results unreliable, and difficult to analyse. The ecological validity is low in the sense of predicting behaviour in a real restaurant setting, but high for analysing purely the behaviour in an online environment.

#### **4.3 Limitations and recommendations for future research**

This study was heavily affected by the Covid-19 pandemic. To follow the safety restrictions, the data gathering was first postponed, then decided to be limited to one subject group. This affected directly the validity of the study and the means of analysis, as no comparison between subject groups nor conditions could be done. Also, the experience of the author, nevertheless how devoted to the project, affected the quality of the research, as designing an experimental study is challenging alone and due to many flaws.

As many hospitality offerings have a social nature, further understanding the differences between the solitary and shared experiences could provide to be fruitful. The special characteristics of group experiences, togetherness, social flow and we-experiences as phenomena, along with memorability of experiences all offer abundant research possibilities, which should be further investigated for the development of the experience industry. The research can benefit from an adaptation of theories from the field of psychology, as the themes are heavily entangled with human behaviour. For future studies addressing these phenomena with the same research methods, I highly recommend to have more strict control over the conditions, and exposing different subject groups to different conditions, as a wider pool of subject persons is needed for adequate results. A combination of research methods is recommendable, but one has to carefully analyse the resources, as utilising physiological measurements is very time consuming and analysis more complex in comparison to traditional measures (Verhulst et al. 2020, 3). For analysing the data, I would further like to suggest considering looking into mean values of GSR in different intervals, instead of analysing simply the peaks. If the analysis is based on detected peaks, the qualities should be further assessed.

#### **4.4 Learning outcomes**

The thesis project has been highly intriguing and beneficial for the author. The project has provided a unique opportunity to explore and deepen one's knowledge on areas of interest, which will surely be a great asset to a future career. Besides the amount of new

knowledge absorbed, independently designing and executing the research has not only improved practical know-how on research planning, but it has further confirmed the author to pursue a career in research, and aim for higher academic degrees. Furthermore, the author's capability on using biometric technology, along with planning and running data analysis was greatly improved, while also new skills such as statistical analyses methods were adapted. Also, skills like academic writing and critical thinking were strengthened in the process.

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# Appendices

## Appendix 1. Pre-questionnaire

### Pre-questionnaire

Group cohesion on technology-enhanced dining experience (thesis)

Choose a statement most accurate for you:

(The group referring to the subject group as a whole participating to this study)

The scale

5 – Strongly agree

4 – Agree

3 – Neither agree nor disagree

2 – Disagree

1 – Strongly disagree

1. I identify with this group as being friends

1            2            3            4            5

2. I engage with this group because I enjoy spending time with the others

1            2            3            4            5

3. I engage with this group because of shared goals

1            2            3            4            5

4. I engage with this group because I think it will benefit me in the future

1            2            3            4            5

5. I engage with this group because of social reasons

1            2            3            4            5

6. I feel accepted as an equal member with the group

1            2            3            4            5

7. I feel safe to share matters of my personal life with the other group members

1                      2                      3                      4                      5

8. I often feel empathetic towards the others if they share personal matters

1                      2                      3                      4                      5

9. When I spend time with the others, I often feel a positive sense of togetherness and connection with them

1                      2                      3                      4                      5

## Appendix 2. Interview questions

# Interview questions

Group cohesion on technology-enhanced dining experience (thesis)

1. What are the main reasons you would engage into an activity such as eating out with this group of people? In any normal situation.
2. Do you feel that all these conditions can be met in a technologically enhanced dining experience where the group is physically in different locations?  
(analyse the reasons mentioned in the previous part together, true/false)
3. What you think most affects to a successful outcome in the context of having a nice dinner with family/friends? Successful outcome as having a good time, also filling the need why you would engage into the activity in the first place. Name elements rating their importance.
4. Can you describe anything that you remember from the experience?  
(Can be anything from a specific moment, topics you talked, food, what somebody was wearing.... literally anything - Details please)
5. Did you feel engaged during the experience? What kept you engaged?  
(Or did your concentration slip to other things outside the experience)
6. Did you lose track of time any point during the experience?
7. Did you feel more self-aware or being part of the group during the experience?
8. How did you feel after the experience was over?
9. How did you feel during the experience?
10. Can you recall any moments you felt especially happy, sad, angry or other feelings compared to feeling neutral? What happened during those moments?

## Appendix 3. Answer sheet for clip reflection

\_\_\_\_\_ (Respondent)

### Clip reflection

Group cohesion on technology-enhanced dining experience (thesis)

Choose a statement most describing your feeling of togetherness during the clip.

Sense of togetherness as a “pleasant feeling of being united with other people in friendship and understanding” (Cambridge University Press 2021).

The scale

5 – Strongly agree

4 – Agree

3 – Neither agree nor disagree

2 – Disagree

1 – Strongly disagree

I felt a sense of togetherness...

1. Clip 1

1            2            3            4            5

2. Clip 2

1            2            3            4            5

3. Clip 3

1            2            3            4            5

4. Clip 4

1            2            3            4            5

5. Clip 5

1            2            3            4            5

6. Clip 6

1            2            3            4            5