EMOTIONAL RESPONSE TO SOCIAL MEDIA COMMUNICATION OF PHYGITAL BRAND EXPERIENCES: Experimental Neuromarketing Analysis

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ABSTRACT

Generation Z reacts positively to social media communication about a phygital brand experience if they identify with the brand. The spontaneous emotions of 28 students were analysed using an experimental methodology and the neuromarketing software FaceReader 9, developed by Noldus. The results confirm that brand affinity predisposes individuals to emotions such as surprise and joy when invited to a phygital brand experience. However, this does not always predict their intention to attend. This study sheds light on consumer behaviour towards phygital experiences and provides recommendations for strategy implementation, brand experience design and communication.

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1. Introduction

his study explores university students' perceptions of the communication of a phygital brand experience on social networks. The concept of the phygital format, which combines physical and digital elements in the same space and time, has seen a marked increase in prevalence across a wide range of sectors, from urban navigation to brand experiences, in recent years. This development has led to the emergence of a novel and extensive field of study within the realm of consumer experience.

The concept of the phygital phenomenon has garnered increased attention in the domains of brand management and brand offerings. Within academic circles, the term has emerged since 2013, first coined by the agency Momentum (Belghiti et al., 2018). One of the primary objectives of this study is to employ an experimental methodology in order to measure the perception and interest in participating in this type of experience among young people. The results of this study will contribute to the expansion of academic research on this phenomenon. Another equally significant objective is to provide knowledge of consumer insights for the purpose of improving phygital experience proposals and their communication by brands.

It is posited by Schroer (2008) that brand affinity and interest in the subject matter are significant factors in predisposing members of Generation Z to participate in phygital experiences. This is a hypothesis that will be explored further in this research. It is imperative for brands to comprehend how Generation Z perceives and responds to phygital experiences if they wish to establish a connection with this increasingly influential demographic. This study has been conducted with university students, who are members of Generation Z, digital natives and daily users of digital devices. The participants therefore have the ability to engage with mixed realities, such as phygital (Dolot, 2018). This possible predisposition will be analysed and contrasted with reactions to a concrete phygital experience proposal. This proposal consists of an interactive exhibition of a well-known local brand, Crims, which broadcasts content on multiple platforms (radio, podcast, books and TV series) and narrates episodes of real crimes.

As Batat (2023) argue, this innovative field of study invites the use of experimental methodologies. The present study will address the perception of university students by analysing their spontaneous emotions using the facial expression analysis software FaceReader 9 (Noldus). This experimental methodology was employed to analyse the spontaneous emotions expressed on the faces of 28 participants while they viewed social media videos advertising a phygital brand experience. The methodology also includes the contrast with a questionnaire that helps to relate brand affinity and emotions, drawing interesting conclusions that can have direct applications in future communication designs and phygital experiences, as well as expanding the existing theoretical field.

This approach is also consistent with the recommendations made by Batat & Hammedi (2023) concerning the necessity of a comprehensive framework for the study of phygital experiences. The phygital format is a synthesis of the physical and digital worlds, with some authors going so far as to suggest that it provides a clear competitive advantage (Johnson & Barlow, 2021). This opportunity for brands and the broadening of experiences necessitates further investigation of the subject and the expansion of proposed frameworks. In addition, applications and transfer should be sought, and studies that contribute to brands by providing new consumer insights should be developed. This format, which has only been in use for 12 years, is becoming increasingly popular. It is evident that this is not merely a transient trend, but rather a result of innovative proposals from brands and a consumption format that is fully adapted to a digital consumer, such as Generation Z.

2. Theoretical Framework

2.1. Brand Experiences

The brand experiences that are the focus of this study are intended to belong to the category of autonomous economic offerings. These are distinct from services aimed at saving time and effort, which are intentionally designed by brands as immersive events to be experienced by consumers (Pine & Gilmore, 1998).

These experiences can be manifested in physical, digital or "phygital" formats, which refer to those that have the coexistence of both formats – digital and physical – in time and space. The concept of brand experience is a multifaceted and nebulous one, with no single definition that can encompass all its

nuances. In their seminal work, Brakus and Schmitt posited that all customer interactions contribute to the brand experience (Brakus et al., 2009). However, Yanina Chevtchouk's systematic review of existing definitions has illuminated a more nuanced perspective. She contends that brand experiences are best understood as memorable events provided by brands, yet these experiences ultimately occur for and "in humans," requiring their presence and active participation (Chevtchouk et al., 2021).

The personalisation and subjective interpretation of experiences by consumers renders their design and research challenging. Conversely, they constitute a more consumer-centric object of study, wherein customers are not mere spectators, but rather an active constituent of the experience that co-creates it (Morgan, 2006).

2.2. Phygital Format

The concept of brand experience has historically been linked to physical environments where customers could engage with the brand through spaces, atmospheres and activities meticulously crafted to evoke memorable experiences. In the era of digital technology, there has been an increasing trend of brands incorporating digital components into their experiences (Burke, 2002). This hybrid approach, known as the "phygital experience", is defined as the simultaneous combination of physical and digital elements within the same space and time (Belghiti et al., 2018).

The advent of digital technologies has facilitated unprecedented access to these platforms, thereby enabling customers to seamlessly navigate between these two spheres, thereby enriching their perception and engagement. As demonstrated in previous studies, consumers ascribe greater value to physical goods than to digital goods (Atasoy & Morewedge, 2018). However, within the experiential domain, personalisation and interaction emerge as the pivotal value drivers (Morgan, 2006; Pine & Gilmore, 1998).

The phygital concept has been the subject of study by several authors, who have examined its impact on brand building. These studies have identified three key technologies that facilitate access to the digital world in real time while enjoying the physical experience. The utilisation of QR codes, augmented reality, and mapping technologies has been identified as a key component of this paradigm shift (Moravcikova & Kliestikova, 2017). In contradistinction to virtual reality, augmented reality does not supplant the physical world; rather, it superimposes information and visual layers on the prevailing reality (Zarantonello & Schmitt, n.d.). In her study, Wided Batat (2023) puts forward an alternative holistic framework for the analysis of the phygital phenomenon, one that is at odds with the logic of omnichannel. The author highlights the phygital experience as a more effective strategy to satisfy the tangible and intangible needs of the target audience by combining both worlds (Batat & Hammedi, 2023).

2.3. The Phenomenon of Brand Love and the Establishment of Brand Relationships.

The notion of brand love has been extensively researched as a pivotal element in fostering consumer engagement and loyalty. Batra et al. (2012) emphasise that brand love is understood from an integrative perspective of different dimensions, including emotional (affection), behavioural and cognitive dimensions. This attribute of the concept is indicative of its relational nature. In this vein, Susan Foruner's model underscores the reciprocal nature of the relationship between the brand and the consumer, positing that feelings of attachment, self-identification with the brand, and supportive beliefs serve to reinforce engagement (Fournier, 1998). As asserted by Wong (2023), the emotional connection with a brand engenders not only momentary satisfaction but also long-term commitment and loyalty, thereby impacting purchase intention (Oishi et al., 2023). In the context of phygital environments, research has demonstrated that integrating phygital proposals into storytelling and brand content has been shown to enhance engagement with the experience (Krtolica-Lukic et al., 2024).

3. Design and Method

This study set out to examine the perceptions of Generation Z members regarding the communication of phygital brand experiences on social networks. The study was meticulously designed to utilise two distinct methods. Firstly, an experimental analysis of emotions was conducted utilising FaceReader 9 software. Secondly, a comprehensive questionnaire comprising ten questions was administered to the same participants to assess their perceptions of the brand, the communication of the phygital experience, and their perception thereof. The results obtained from these two methods were then contrasted to gain a more comprehensive understanding of the subject.

3.1. Experimental Neuromarketing Analysis

A primary decision that was made at the outset of the project was to select a case study of a phygital brand with which to develop the communication strategy and to enable the participants to share their reactions. In pursuit of a prominent and pertinent brand, the interactive exhibition of a renowned entertainment brand, Crims, which premiered in Barcelona in 2023 and remained accessible for 165 days without charge, was selected. This exhibition attracted over 1,000 attendees per day and elicited substantial queuing. To date, this brand has achieved more than 35 million views or listens on the various platforms on which its true-crime content is broadcast. This is a notably elevated number of consumptions, particularly when one considers that all of its communication is in Catalan, a language spoken by 10 million people. In this regard, the brand can be regarded as a local entity, yet it is highly recognisable. In order to obtain results, it was necessary to choose a brand with impact and easily identifiable, and one of the objectives was to check whether brand affinity predisposed young people to participate in phygital experiences.

The selected sample was also required to respond to the local profile. Participants were required to be either from Barcelona, where the exhibition was launched, or from the surrounding area. They were also required to have knowledge of the Catalan language and to belong to Generation Z, defined as those born between 1995 and 2012 (Schroer, 2008). This generation is also characterised by high digital skills and an ability to move easily in mixed environments, such as phygital ones (Dolot, 2018; López Vidales & Rubio, 2021). The selection of the sample is made in a university environment that can be regarded as a consumer of the brand of entertainment, which is characterised by multiple formats, ranging from podcasts to series on a platform. The exhibition incorporates an app as a gamification element that is more aligned with the Z Generation. Fifty students were invited to participate in the study and were provided with a brief explanation of the experimental methodology. The experimental methodology involved the recording of the subjects' faces. Of those invited to participate, 28 volunteers consented to take part in the study. Informed consent was obtained from all participants, who also provided written consent and provided a photograph of their face for the exclusive use of the study. The photographs were stored securely by the principal investigator under a procedure that had been previously approved by the university's ethics committee.

The participants were presented with a 1:18-second video consisting of a series of three consecutive video clips, collectively referred to as a "reel" or "carousel". While the initial two videos depicted physical experiences involving brands or universities, with participants engaged in activities, the third video, spanning 50 seconds, served as the actual stimulus. This video contained an invitation to Crims' phygital exposure, which was subsequently analysed through the utilisation of face-reading software. The initial videos served a mere introductory function, aimed at calibrating the face-reading software. The subsequent video contained images of the past Crims exhibition, accompanied by an explicit invitation to the viewers to visit the exhibition once again, as it was returning to the city. During the observation period, the participants' reactions were documented through the utilisation of a camera that was positioned on the same viewing monitor. Participants were assigned numerical identifiers ranging from 101 to 128 to safeguard the confidentiality of their identities in subsequent analyses.

The videos depicting facial expressions of emotion were subsequently subjected to analysis using Noldus' FaceReader 9 software. This software was developed and validated on the basis of psychological theories of emotion, specifically Ekman's research and the Facial Coding System (FACS). The neuromarketing software utilised in this study enables the coding of emotions including happiness, sadness, anger, disgust, fear, surprise and contempt, in addition to neutral expression. This analysis system has been utilised in preceding studies for the identification of emotions prior to static images

(Yu & Ko, 2017) or in motion (Fondevila-Gascón et al., 2021). This has served to demonstrate the validity of the system and the methodologies employed (Skiendziel et al., 2019).

3.2. Contrast Questionnaire

In addition to the emotion analysis, data was collected through the administration of questionnaires that measured brand affinity and intention to attend the experience. The surveys were completed, with respondents providing only their participant numbers, in order to correlate these with the emotion analysis during the preview. The students completed a survey comprising 10 questions, of which 2 were deemed the most relevant for further analysis. The responses were scored on a 7-point Likert scale (Sullivan & Artino, 2013) in relation to brand affinity and intention to visit the exhibition. The question regarding brand affinity is illustrated in Table 1 below.

Table 1. Question 4 of the Crims brand affinity survey.

	How familiar are you with the CRIMS brand?	Likert equivalence
a)	I am a fan and follower of their content, whether it is the series, podcasts or books.	7
b)	I have listened to podcasts and/or watched several episodes or seasons.	6
c)	I have ocasionally watched, listened to or read a podcast episode, book or series.	5
d)	I have seen or listened at least one episode of Crims.	4
e)	I remember seeing or reading something about the brand in the media or social	3
	networks.	
f)	I am familiar with the brand, but I have not consumed its content.	2
g)	I am not familiar with CRIMS.	1

Source(s): Own elaboration, 2025.

The integration of neuromarketing techniques with conventional methodologies has enabled the delineation of the impact of brand affinity on the perception of a phygital experience. The present experimental methodology aligns with the proposals of Wided Batat (2023) and his holistic research framework, which aims to address consumer behaviour in relation to the phygital phenomenon in academia (Batat, 2023).

4. Fieldwork and Data Analysis

The analysis of the emotional responses of 28 participants was conducted over a period of three days: 28-29 November and 5 December 2024 in Barcelona, in university classrooms. The procedure entailed the completion of a written consent form by each participant, permitting their involvement in the study. This was followed by the viewing of a video clip, which lasted for one minute and eighteen seconds. During this period, a camera installed on the viewing monitor recorded the facial features of each participant. Upon completion of the survey, the participant, who was identified by a number to ensure the maintenance of anonymity, completed a 10-question survey on a separate computer. Each participant viewed the videos in a silent environment, with the possibility of concentrating their attention on the viewing, in the same way as the subsequent survey.

Subsequently, data analysis was conducted by importing the videos into Noldus FaceReader 9 and identifying the specific Crims video as the stimulus, the relevant part for the study. Following the analysis of all videos to identify the seven emotions (i.e. neutral, joy, surprise, sadness, anger, fear and disgust), the analysis was exported to Excel for further analysis and comparison with the survey data. The activity of watching a video, being passive, has resulted in a greater neutral response in the entire sample; therefore, it was decided to discard this variable in all participants and measure the variation of the other positive and negative emotions, although some are not very noticeable. The findings from the facial analysis were incongruent with the subsequent survey administered to the participants, thereby unveiling multifaceted relationships between brand affection, the inclination to attend the event, and the manifestation of emotions identified by the software as joy, surprise, sadness, anger, fear, and disgust (see Table 2 below).

Table 2. Analysis of the emotions of 28 participants in the face of the communication of a phygital brand experience in networks

Participant	Brand	Intention	Joy	Surprise	Sadness	Anger	Fear	Disgust
	Love	Visit						
14	7	6	0,003	0,016	0,476	0,000	0,000	0,060
20	7	6	0,000	0,177	0,048	0,115	0,001	0,001
23	7	1	0,000	0,001	0,007	0,036	0,000	0,000
2	6	5	0,000	0,051	0,006	0,000	0,001	0,000
3	6	1	0,004	0,041	0,027	0,012	0,006	0,004
4	6	6	0,001	0,064	0,003	0,009	0,002	0,000
10	6	5	0,001	0,006	0,105	0,011	0,000	0,000
11	6	6	0,000	0,016	0,010	0,004	0,000	0,000
12	6	7	0,000	0,005	0,040	0,113	0,014	0,001
15	6	4	0,154	0,002	0,058	0,111	0,018	0,068
18	6	6	0,016	0,002	0,031	0,000	0,000	0,000
21	6	7	0,000	0,001	0,024	0,336	0,002	0,001
26	6	5	0,000	0,006	0,051	0,025	0,000	0,001
27	6	6	0,000	0,077	0,002	0,010	0,097	0,000
5	5	4	0,004	0,003	0,084	0,177	0,000	0,000
22	5	5	0,015	0,003	0,065	0,031	0,001	0,001
24	5	4	0,002	0,028	0,014	0,002	0,001	0,000
28	5	4	0,000	0,037	0,301	0,038	0,005	0,001
8	4	4	0,000	0,005	0,065	0,008	0,006	0,000
19	4	3	0,001	0,001	0,475	0,205	0,000	0,001
25	3	4	0,020	0,004	0,074	0,006	0,000	0,178
1	2	1	0,008	0,009	0,161	0,007	0,004	0,002
6	2	5	0,001	0,027	0,031	0,033	0,016	0,009
7	2	5	0,002	0,004	0,001	0,013	0,001	0,002
13	2	1	0,000	0,071	0,052	0,013	0,024	0,000
16	2	3	0,001	0,001	0,097	0,205	0,000	0,006
17	2	6	0,003	0,014	0,408	0,007	0,000	0,002
9	1	5	0,000	0,008	0,013	0,010	0,001	0,002
AVERAGE			0,008	0,024	0,097	0,055	0,007	0,012

Source(s): Own elaboration, 2025.

This Table 2 shows the average emotion of each participant during the viewing of the stimulus, Crims promotional video, and the average emotion of the total number of participants in the last row. The numbers indicated in grey are the above-average values for the emotions of joy and surprise.

5. Results

The preliminary analysis of the results eliminates the predominant emotion in all participants, which is neutral with an average of 0.78. This is probably because video viewing itself is a passive activity that provokes few emotions. The software's capacity to identify emotions, including those that are challenging to discern, by attending to the surrounding emotions ensures that no information is lost. The objective of the study is to discern even the slightest variations between emotions and individuals. Consequently, it was determined to eliminate this predominant fundamental emotion and to compare the means of the other emotions in the 28 participants. In the course of the analysis of the remaining six

emotions, it was determined that a distinction should be made between positive emotions such as joy and surprise (although the latter can be ambivalent, it was determined that the reaction in the context of this study would be positive) and negative emotions: sadness, anger, fear or disgust.

Firstly, it is observed that participants with a high level of brand love (with values from 5 to 7 corresponding to high and moderate affinity according to Table 1) also tend to show higher levels of surprise and joy. Specifically, of the 17 participants who exhibited brand affinity, 9 (52.94%) demonstrated higher than average levels of joy or surprise. This reaction was observed in only 36.36% of the participants who scored 1 to 4 in brand affinity. A consideration of the subset of participants who demonstrated the highest levels of brand affinity, indicated by scores of 6 and 7, reveals that the proportion of individuals experiencing positive emotions consistently exceeds 50%. This is indicative of an average or above-average emotional response. The more pronounced difference between the two groups therefore suggests that level 5 of brand affinity could be a turning point in the emotional relationship with the brand.

These same participants demonstrated a heightened propensity to attend the event, thereby substantiating the hypothesis that brand affinity exhibits a positive correlation with a positive emotional response.

A further salient finding is that participants who expressed a high level of interest in attending the event in the future (scoring 5 or 6) exhibited moderate levels of surprise and joy. This suggests that, even if these participants are not committed adherents of the brand, the invitation elicited a favourable response. Conversely, those who responded that they would not attend or were uncertain demonstrated elevated levels of sadness and anger. In this sense, it is a finding that, like others, would require a larger sample to be able to affirm with certainty, but it is the most reliable indicator that the communication manages not only to excite, but also to provoke a predisposition to attend, without the mediation of affinity to the brand.

The presence of surprise has been identified as a notable aspect among individuals who possess a sense of affinity towards the brand and demonstrate a propensity to attend. However, in participants with less brand awareness, surprise does not necessarily translate into an intention to participate, suggesting that this emotion alone is not sufficient to motivate attendance.

A further emotion that is worthy of note is sadness, which was prevalent among the totality of the participants, with 46.43% of them scoring above average. This phenomenon may be directly associated with the content of the video, which addresses criminal activity and potentially evokes this emotional response. The notion that "crime is a collective failure" is a fundamental tenet of the Crims brand, which approaches this genre with the utmost rigour and respect for the victims.

With regard to the elicitation of fear, although the video and music were designed to do so, the data suggest that this emotion was not strongly manifested in the majority of participants, with an average of 0.007. However, subjects demonstrating lower affinity or knowledge of the brand exhibited marginally elevated levels of fear (e.g. participant 16 with 0.205 and participant 19 with 0.205), suggesting that brand familiarity may serve as a mitigating factor in the fear response by providing a more contextualised framework within the true crime genre. Conversely, participants exhibiting higher levels of affinity demonstrated virtually no instances of fear. This may suggest that the relationship with the brand could potentially lead to a heightened acceptance of the tone of the content, without it being perceived as a genuine threat.

The analysis suggests that the relationship between emotions and interest in attending the event is mediated by brand love. Those who have already established an emotional connection with the brand demonstrate a greater propensity to engage, exhibiting positive sentiments and a higher level of participation. Conversely, individuals lacking such a connection are more likely to exhibit neutral or negative sentiments and demonstrate diminished interest in the phygital experience. It can thus be deduced that experiences offered by brands that combine physical and digital elements should be designed with a view to engendering customer engagement and fostering brand loyalty, on the condition that the customer has already developed a certain degree of brand loyalty. Conversely, it would not be as efficacious as an initial or recruitment proposition, as it would have a more arduous time eliciting the positive emotions that influence the intention to participate in a phygital brand experience. This statement evidently exceeds the limitations of the present study, which is extremely focused on a specific case and a sample representative for it, but not for general extrapolation. This finding

underscores the necessity for future research to be conducted on the relationship between emotions, brand affinity, and the intention to engage in phygital experiences.

6. Conclusions and Discussion

The present study is initiated with the explicit objective of augmenting the extant contributions to academic research on the phygital phenomenon (Belghiti et al., 2018), with a particular emphasis on brand experience (Pine & Gilmore, 1998). This particular focus is predicated on the premise that brand experience constitutes one of the most consumer-centric value propositions, and thus, is deemed to be a pertinent lens through which to comprehend the manifold contributions of mixed physical and digital realities. The present study poses the question of whether the phygital format is truly the most appealing for consumers. The combination of physical and digital elements appears to provide brands with a competitive advantage, offering the best of both worlds (Johnson & Barlow, 2021). However, this assertion remains unproven and requires further refinement, as it does not consistently generate the desired level of engagement as a format, a conclusion that contradicts the proposal put forward by W. Batat (Batat & Hammedi, 2023). In this sense, the present research confirms that phygital brand experiences provoke positive emotions when communicated on social networks, but above all for those target audiences that have an affinity for the brand or certain knowledge of it. In this sense, the experiences and their phygital format, despite being a consumer-centred proposal, must clearly demonstrate their objective of deepening relationships, building loyalty and broadening engagement. However, it is difficult to capture or convert, especially when it comes to the Generation Z audience (Schroer, 2008), which has been the subject of this research.

By focusing on this particular audience, as is appropriate for the object of study (Dolot, 2018), it should be noted that this also entails a limitation. It is important to acknowledge that the conclusions drawn are indicative of phenomena that could be investigated in other audiences belonging to different generations. It is evident that a key limitation is the selection of the subject matter of the stimulus. This is illustrated by the choice of phygital brand experiences, which are a very specific subject and a local brand, Crims, with considerable impact, but delimited in context. The brand's strong presence and recognition in the territory, despite the limited statistical significance of the sample size, are indicative of its notable market presence. Furthermore, the study revealed a high level of brand awareness and the establishment of noteworthy relationships, which are crucial for the brand's strategic positioning and long-term success. Of the 28 participants, only one was unaware of the fact.

The final analysis indicates that brand affinity elicits positive feelings towards phygital brand experience communication, but the intention to attend is more marked by affinity than by the emotions elicited by the video advertisement. The findings from participants exhibiting low brand affinity, yet expressing a willingness to attend, offer a glimmer of optimism for the efficacy of communication. It can be hypothesised that effective communication, capable of eliciting positive emotions, may potentially supersede brand affinity. Due to the limited sample size, statistical significance could not be confirmed. However, the results remain pertinent, given the level of detail and the substantial amount of frame-by-frame analysis data on seven emotions provided by Noldus FaceReader 9. In this sense, it is very gratifying to be able to employ new experimental methodologies, so well suited to a yet to be defined field such as phygital.

Notwithstanding these limitations, the study puts forward several suggestions for future research, including the extension of the present study to different audiences and the conducting of quantitative research with more representative samples. Furthermore, the study calls for the study of other rational factors in the perception of phygital experiences. A potentially ambitious and intriguing approach would be to devise an experimental methodology for analysing consumers' emotions while they engage with the phygital experience. This endeavour aims to surpass the neutrality of more passive activities, such as merely observing.

In conclusion, it is important to highlight the contribution of this study to the management of brands and their phygital experiences. A consideration of the practical implications for implementing phygital strategies, based on the holistic framework proposed by Batat & Hammedi (2023), reveals the following recommendations for further consideration:

The targeting of phygital experiences at current customers rather than potential customers is recommended.

The recommendation is that phygital experiences are more likely to be accepted by audiences who are more brand-aware, but also by those who are new to the brand or who would score between 5 and 7 on a Likert scale. It is evident that positive emotions have a significant impact on brand awareness. However, in the context of brand loyalty, brand affinity emerges as a predominant factor. Furthermore, the emotions elicited by communication can, under certain circumstances, influence the conversion of potential customers, provided that positive emotions are effectively induced. Evidently, these recommendations are derived from a comprehensive study, encompassing a substantial sample and substantiated by concrete outcomes. Nevertheless, their pertinence to the comprehension of the consumer within the phygital context and to contemporary experiential marketing remains unassailable.

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