

# Thematic Analysis as a Phenomenological Data Analysis Method for Human-Computer Interaction

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## Abstract

As presented in a grand challenge from the Brazilian Human-Computer Interaction (HCI) community, there is a need to revisit and find new theoretical-methodological foundations to account for the emergent phenomena surrounding our interaction with computational technologies. In this paper, we examine and discuss Thematic Analysis as phenomenological data analysis method to be used in HCI research. In this approach, we emphasize the context of embodied interactions and socioenactive systems, where non-verbal bodily actions and social interactions take the centre stage. We do so by briefly presenting the socioenactive system Aquarela Virtual, and then presenting and discussing two Thematic Analyses studies related to the use of this system: one emphasizing social and enactive interactions, and another emphasizing manifestations of imagination in enactive interactions. As our main contribution, we argue that while it requires a more nuanced and inevitably human approach to data transcription and a more contemporary understanding of scientific values, Thematic Analysis is well-suited as a phenomenological method for HCI.

## Keywords

Thematic Analysis, Phenomenology, Method, Data Analysis, Human-Computer Interaction

## 1. Introduction

The adoption of new theoretical and methodological approaches is considered a grand challenge by the Brazilian Human-Computer Interaction (HCI) community for the next ten years (2025–2035) [1]. In the grand challenge, the authors express how the HCI community needs to revisit and find new theoretical-methodological foundations to account for the phenomena surrounding our interaction with computational technologies, hinting towards phenomenology as a potential approach. In this direction, as phenomenology emphasizes the relationship of whole-bodied individuals to their (physical, social, and digital) contexts, it follows that we need methods that account for capturing, describing, and analysing interaction in a more phenomenological way. This can be viewed as a movement to go beyond more traditional approaches commonly found in the field of HCI, such as measuring usability (e.g., efficiency or efficacy), or even subjective but still reductionist approaches of User Experience (UX) (e.g., satisfaction or engagement). One interesting prospect we will address in this paper is the popular method known as Thematic Analysis [2].

Proposed by Virginia Braun and Victoria Clarke, Thematic Analysis [2] is a well-known and widely used data analysis method for qualitative data. The method is used to identify, analyse and present patterns (themes) found in the data, including their interpreted meanings and how these themes may relate to each other. How it is applied may vary (e.g., it can be inductive, deductive, reflexive *etc.*), but it usually involves the following steps: data transcription, coding, and identification, revision and definition of themes, usually presented as a thematic map. Even though the method was initially proposed in the field of Psychology, it was quickly adopted in other fields. As opposed to other popular qualitative methods, such as Grounded Theory [3], Thematic Analysis presents itself as being flexible and adaptable to different research contexts, and as a result it became widely used in scientific literature. However, even

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though Thematic Analysis is sometimes pointed out as being experiential/phenomenological, Braun and Clarke argue that it is not an inherently phenomenological method [4]. Indeed, the method is often used with emphasis on verbal language and meanings, through the analysis of verbal transcriptions (e.g., from interviews) or written text.

Nevertheless, the flexibility of Thematic Analysis makes it suitable to go beyond language by also analysing social interactions, body movement and actions and other phenomenologically interesting events. Therefore, in this paper, we examine and discuss Thematic Analysis as phenomenological data analysis method to be used in HCI research. We emphasize the context of embodied interactions and socioenactive systems, where non-verbal bodily actions and social interactions take the centre stage of research. We do so by briefly presenting the socioenactive system Aquarela Virtual, and then discussing two different Thematic Analyses conducted with data collected during the use of this system. Each presented analysis comes from a selected study, and although they share similarities (e.g., both can be considered reflexive), one can be considered more inductive towards the observed social and enactive interaction, and the other can be considered more deductive towards identifying imagination in enactive interactions (neither, however, is exclusively inductive nor deductive).

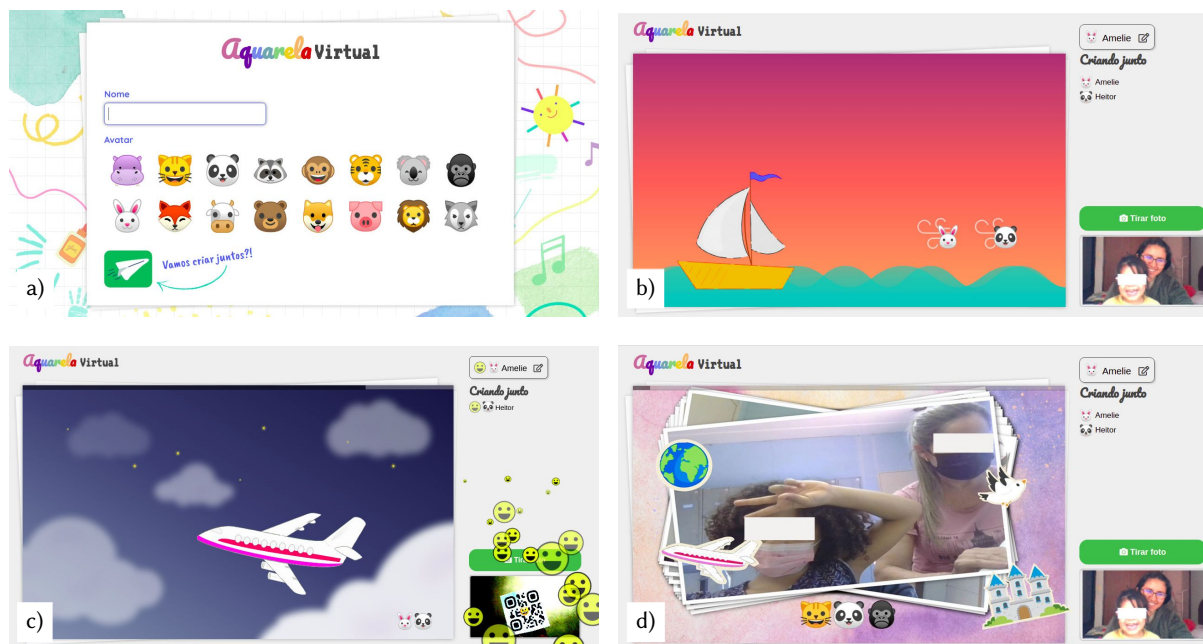
## 2. The Aquarela Virtual Socioenactive System

The Aquarela Virtual [5, 6] is a system designed in the context of the Socioenactive Systems project<sup>1</sup>. Also in the context of social isolation due to the COVID-19 pandemic, the system was designed to allow children to interact synchronously with verses and elements from the song Aquarela [7] (a popular song in Brazilian culture, often associated with childhood and tenderness), and with each other through these verses and elements. The interaction with the Aquarela Virtual system takes place through the manipulation of physical artifacts related to the song (e.g., castle, sun *etc.*) with QR codes that can be shown to a computer with a webcam – these artifacts were previously hand-made with scrap materials by the children themselves, with support of their teachers and parents, as part of their regular school activities. When a specific element is detected by the webcam through its QR code, an animation of the verse related to that element is played to all connected children. There is also the possibility of “joining” a verse that is currently being played, or showing printed emojis to share affective states. Every action that is captured by the system (e.g., showing artifacts or emojis) is broadcasted to everyone else currently connected. The physical context of the interaction with the Aquarela Virtual system, including objects that can be interacted with, is shown in fig. 1, and different moments of its graphical interface are shown in fig. 2.



**Figure 1:** Two examples of the physical context of children interacting with the Aquarela Virtual system, with a selection of song objects and emojis that can be shown to the computer in front of them [5].

<sup>1</sup>São Paulo Research Foundation (FAPESP), Brasil. Process Number #2015/16528-0. <https://socioenactive.ic.unicamp.br/>



**Figure 2:** Four different moments of the graphical interface of the Aquarela Virtual system: a) the initial screen with the selection of a name and avatar to be used in the system; b) a verse about a sailboat being played with two children “joined in” on the animation through their avatars; c) a verse about an aeroplane being played while a child shows a happy emoji; and d) a closing moment where photos of everyone who participated in the session are displayed while the Aquarela song is played [5].

The Aquarela Virtual system was used in workshops held at the Centro de Convivência Infantil (CECI), part of the Divisão de Educação Infantil e Complementar (DEdIC) of the Universidade Estadual de Campinas (UNICAMP). This place provides a preschool structure located within the university campus that is aimed at accommodating children from students, faculty, and staff. Eleven children – aged between 4 and 6 years old – participated in the workshops, that were conducted on November 4th and 5th, 2021, and were filmed for later analysis. This research was approved by a Research Ethics Committee (CAAE 72413817.3.0000.5404). These videos compose the dataset that was used in the two Thematic Analyses that we will briefly present in the following sections.

## 2.1. First Thematic Analysis: Social and Enactive Interactions

The first Thematic Analysis we will address focused on social and enactive interactions of one child with the Aquarela Virtual system [5]. Besides speech, the transcription of the data emphasized the handling of physical objects, gestures, posture, body movements, and verbal and non-verbal interactions with an accompanying adult, with 17 minutes of interaction being transcribed. This Thematic Analysis can be considered more inductive towards the observed social and enactive interaction because it did not follow predetermined goals or had predetermined actions that needed to be accounted for. The following excerpt illustrates a transcribed moment, alongside the subsequent codes that were attributed to it (this excerpt is a free translation from Brazilian Portuguese, and uses a fictitious name to preserve the anonymity of the participant):

[00:20]: Clara holds the sad (blue) *emoji* with her right hand, while with her left hand she grabs happy (yellow) *emoji*, showing both to the computer at the same time. Initially, Clara moves the *emojis* quickly up and down, and then holds them crossed, still showing them to the computer.

Codes: object manipulation - emoji; affective expression - emoji; interaction with the system - web-cam; exploration with objects - movement and emoji.

The Thematic Analysis of the coded transcription resulted in the following themes (in a free translation from Brazilian Portuguese): *Interaction, Identification (of others, of themselves), Autonomy, Exploration,*

*Socioaffectivity*, and *Communication (local or remote and verbal or bodily)*. Further details about the Thematic Analysis, including a detailed explanation of the themes, instances for each theme, and their relationship through a thematic map, can be consulted in the original study [5]. In the present paper, we emphasize how the Thematic Analysis method was successful in allowing the coding and identification of themes related to embodied actions surrounding the socioenactive system, going beyond verbal communication and capturing even subtle actions and movements.

## 2.2. Second Thematic Analysis: Imagination in Enactive Interactions

The second thematic analysis we will address focused on the emergence of perceived imagination during enactive interactions of the same child with the Aquarela Virtual system [6]. This analysis was conducted on top of the same transcription as the previous one, but by a different researcher with a different focus. Therefore, acknowledging that the transcription is not an objective truth, but rather a subjective interpretation of the collected video data, this researcher reanalysed the recorded video and introduced additional details into the transcription. This Thematic Analysis can be considered more deductive towards identifying imagination in enactive interactions, because of a clear focus of the researcher, although she was still open towards analysing emergent behaviour. The following excerpt illustrates a transcribed moment (with an example of an added detail in *italics*), alongside the subsequent codes that were attributed to it (this excerpt is also a free translation from Brazilian Portuguese, but here presented as originally translated to English in the published study, including a different but still fictitious name to preserve the anonymity of the participant):

[01:11] Ana takes the happy emoji (yellow) and shows it to the computer while making a low/high-pitched sound and turning her head to her left, *as if she was 'posing' when showing the emoji to her colleagues who are in the videoconference*, still looking at the computer.

Codes: object manipulation - emoji; affective expression - emoji; interaction with the system - webcam; local verbal communication - expression; body language - pose.

This Thematic Analysis resulted in the following themes: *Interaction, Identification (self, other), and Embodied Imagination (Exploration, Enactive metaphor and Playfulness)*. Further details about this Thematic Analysis, can be consulted in the original study [6]. For this example, we emphasize how the Thematic Analysis method embraces the subjective experience of transcribing and analysing data, instead of trying to suppress it through, for instance, a mandatory coefficient of agreement between researchers (e.g., Cohen's kappa). Different researchers can look at the same data and come out with different transcriptions and analyses, which can all be valid according to their subjective experience. Although this may raise concerns towards the rigour of the methodology, we believe that it can still be assured by a detailed report that illustrates and explains a concrete mapping between transcription, codes, and themes.

## 2.3. Discussion

The two presented studies are examples of how Thematic Analyses can be a suitable phenomenological data analysis method of inquiry in HCI. These two examples highlight how Thematic Analysis can be flexibly used beyond the scope of verbal communication, also considering embodied actions (e.g., gestures, movements, postures, expressions *etc.*) as well as non-verbal social interactions (e.g., looking at someone else, showing someone something *etc.*).

An inevitable implication of this approach, however, is how the transcription process becomes a much more complex effort with inevitable subjectivity (*i.e.*, the transcription becomes a product of the combination of researcher and data, and not only data). Instead of only transcribing what is said, the transcriber now needs to pay attention to and write down small gestures, movements, and other perceived actions deemed relevant, no matter how subtle they may be, and can also add their more

interpretative and reflexive perception to what is being transcribed. It is worth noting that current advances in Artificial Intelligence (AI) as a transcription and qualitative data analysis tool are rendered virtually useless in this context, as no AI system seems to come close to being satisfactory in recognizing the nuanced aspects we highlighted in our examples. Nevertheless, a bright side of this realization is that it further emphasizes the importance of the researcher as an irreplaceable agent of the process, which correlates with another Brazilian HCI grand challenge on the implications of AI in HCI [8].

On the topic of the role of the researcher, it is also important to discuss how this increased subjectivity relates to the prominent scientific values of rigour, reproducibility, and transparency. Traditionally, when we bring up research paradigms in general and even in HCI [9], subjectivity is often regarded as a problem to be addressed. Even qualitative approaches such as Grounded Theory [3] often require a coefficient of agreement between researchers as a rhetoric argument towards a presumed “universality” in the presented results. We, however, subscribe to the same view of the proposers of Thematic Analysis on this subject, Virginia Braun and Victoria Clarke, who argue that:

“Demonstrating coding reliability and the avoidance of ‘bias’ is illogical, incoherent and ultimately meaningless in a qualitative paradigm [...] researcher subjectivity is conceptualised as a resource for knowledge production, which inevitably sculpts the knowledge produced, rather than a must-be-contained threat to credibility.” [4]

Therefore, we do not view the subjectivity presented in our examples as a problem or a threat to the credibility of these studies. In a Thematic Analysis, the value of rigour is preserved through a process that is still systematic and carefully conducted. The value of reproducibility and transparency, in turn, are inseparable. The former does not mean that a different researcher, in a different context, will reach the same results, but rather that through the latter – transparency of data, process *etc.* – the entire analysis can be traced and verified, from transcribed data to codes and all the way to the resulting themes and thematic map. Each analysis will be different, but this is not a problem as long as the process is transparent to the point of being possible to trace and verify its results.

### 3. Conclusion

The grand challenge of new theoretical and methodological approaches for HCI opens many opportunities to revisit and reframe established methods. In this paper, we have shown through examples that Thematic Analysis can be well-suited as a phenomenological data analysis method for HCI. This adoption requires, however, a more nuanced and inevitably human approach to data transcription, and also a more contemporary and phenomenological understanding of scientific values: rigour is preserved through a systematic and carefully conducted process, and reproducibility and transparency should be understood as the ability to trace and verify results instead of universality.

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### Declaration on Generative AI

During the preparation of this work, the authors used LanguageTool in order to: Improve writing style and Grammar and spelling check. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the publication’s content.

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