Bridging the Challenges in Experience Sampling Research

Barbi Seme†
Center for Cognitive Science
University of Ljubljana
Ljubljana, Slovenia
Barbi.Seme@pef.uni-lj.si

Maruša Sirk
Center for Cognitive Science
University of Ljubljana
Ljubljana, Slovenia
Marusa.Sirk@pef.uni-lj.si

Urban Kordeš
Center for Cognitive Science
University of Ljubljana
Ljubljana, Slovenia
Urban.Kordes@pef.uni-lj.si

Abstract

In this paper, we draw parallels between existing research practices and attempt to piece them together to propose a more wholesome approach in conducting experience sampling research. We consider Experience Sampling Methods (ESM) as valuable tools for studying experience, but they come with challenges, of which we address the participant burden as one of the most significant ones. We think that integrating practices from Personal Science (PS) and Citizen Science (CS), grounded in empirical phenomenology, can help address this challenge. By considering participants as co-researchers and actively engaging them in the research and community, we aim to enhance their motivation and improve the quality of the research data. We illustrate this approach through the pilot project Luna in which we explore lived experiences throughout the menstrual cycle using the ESM mobile application "Curious". This integrative method facilitates a reciprocal knowledge exchange between researchers and co-researchers, which deepens the process of self-exploration and holds a great potential to advance scientific research on experience.

Keywords

Experience sampling methods, citizen science, personal science, empirical phenomenology

1 Introduction

Scientific research into experience is a rapidly growing field. Some researchers and philosophers point out that a core problem within our current scientific worldview is the overlooked experience research [1]. New methods and tools for researching experience are being developed, among which are Experience Sampling Methods (ESM). ESM are intensive longitudinal approaches to collecting experiential and contextual data using structured diary self-report techniques [2]. Due to numerous advantages, especially ecological validity and the reduction of recall bias, ESM has spread to various research fields through the use of mass technology, mostly mobile applications [3]. Based on numerous studies [4, 5, 6] that have used ESM to investigate experiential phenomena in the past few decades, weaknesses of these methods have been identified [7].

We present ESM and the challenges inherent in ESM research, particularly participant burden. By exploring the interest in personal exploration within Personal Science and emphasising the importance of community building in Citizen Science, we attempt to tie these practices together using the concept of a methodological turn from empirical phenomenology [8]. We believe that the challenge of participant burden, which we see as under addressed but highly disruptive in ESM scientific inquiry, can be tackled through this integration of different research practices. We illustrate this approach with our pilot study, Luna.

2 Experience sampling research

We consider Experience Sampling Methods (ESM) as an umbrella term for the research in which participants gather samples of their experiences as they unfold in their life [9]. Typically, we prompt participants at random times to answer questions or to describe their experience of the moment just before they heard the beep [10]. This way we are able to minimise recall bias [7] and are able to sample dimensions of experiential states which are nearly impossible to recall later, especially in detail (e.g., the momentary content of our thoughts). These methods are also highly ecologically valid, since we are sampling experience as it unfolds naturally in people's everyday lives. Participants would receive the prompts several times per day for a longer period of time (e.g., two weeks). These repeated measures enable us to track patterns and changes in individual experiences across time and different contexts [7, 10]. Nowadays we use mobile applications on participants' personal smartphones which makes the data collection process in comparison to pen and paper much more reliable and less burdensome [11].

2.1 Challenges in ESM

ESM research is still loosely defined without a rigorous framework and we are yet to develop appropriate methodological approaches for improvements [9]. A significant challenge in ESM research is participant burden. Collecting frequent, real-time data in everyday life activities puts great demands on participants who need to albeit shortly interrupt their activity to report on their momentary experiential state [3]. These repeated measures over time might affect participants' attitudes towards the research and result in reduced compliance, careless responding and participants' attrition [12]. We should also evaluate this burden from an ethical perspective, ensuring that

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benefits outweigh the burden, especially if there is a consideration of affecting participants' well-being [13].

2.2 Existing recommendations for addressing the challenges in ESM

To mitigate this burden, researchers are working on questionnaire optimisation, making them as brief and focused as possible by prioritising essential questions and using clear and concise language [9]. The trade-off between data richness and burden on participants is also mitigated with lowering the sampling frequency [12]. By introducing the personalised scheduling for participants we avoid interrupting them in the situations in which they are unable to respond and would likely react negatively to prompts being delivered in that time [3]. Albeit we should then revise random sampling and account for the introduced bias (e.g., we could supplement the data with retrospective daily reports).

However, a key factor for successful ESM research is participants' motivation [3, 7]. It is better sustained by considering the necessary technical recommendations, but researchers should also give attention to fostering the research interest and social dynamics. Researchers should engage participants who already have interest in the research topic and therefore an intrinsic motivation to learn more on it [3]. They should also provide a sufficient training period in which participants gain the necessary knowledge and skills in order to sample the experience [7]. It is important to establish a rapport with participants and to foster a research alliance throughout the study [2]. It is suggested to provide rich feedback to participants during and at the end of the study which can also be presented as non-monetary compensation [3].

3 Personal science and interest for self-exploration

Technological advancement played a great role in a growing number of ESM studies as well as in an uptake of self-tracking practices for exploration of oneself [14, 15, 16]. The umbrella term for self-tracking practice and communities has been formed under Personal Science (PS) [17]. These individuals and groups pursue their own personal research questions using empirical methods in an iterative process of questioning, designing, observing, reasoning, and discovering which presents itself as an opportunity to scientifically expand on PS. Even though we can draw many parallels between self-tracking and scientific inquiry the question remains to what extent PS can be scientifically interesting [18]. Considering the growing interest in PS activities it seems important to address these practices, especially in new self-trackers. They often experience difficulties in making sense of their self-tracking process in interpreting their data, formulating and refining their research questions, and designing their research process [19, 20]. It would be beneficial for them to receive support that provides at least an initial establishment of their research or engaging them in a more systematic way. Lack of scientific rigour was also reported by researchers in tools used for self-tracking which can potentially mislead self-trackers and give them false ideas of phenomena they explore [21, 22]. Hence, we believe this is an excellent opportunity for the science community to engage in this already widespread phenomenon. Individuals and groups who already possess deep interest in self-exploration can potentially become great co-researchers by which they would gain support in their own exploration as well as make the scientific contribution.

4 Community in Citizen science

Citizen Science (CS) is recognized as one of the eight pillars of Open Science, playing an integral role in democratising scientific knowledge and practices [23]. It significantly bridges the gap between the scientific community and society through the idea of doing science and not merely reacting to it [24]. Due to the heterogeneity of CS projects in terms of scale, objectives, and levels of citizen scientist involvement, it is challenging to provide a universal definition [25]. However, common to all CS projects is to actively involve non-professionals in scientific research at different levels of participation [26]. In a broad sense citizen scientists perform tasks that would be otherwise done by scientists [27] or would not be possible to do without their involvement.

To achieve reciprocity between science and society in CS projects in which the bidirectional knowledge exchange facilitates benefits in both [28], significant time and resources need to be invested to establish the conditions for project activities to run [29]. Since citizen scientists are typically lay people without formal training in scientific research, appropriate training and support are essential to equip them with necessary skills and knowledge [30]. We know citizen scientists engage in the projects upon different motivation factors. We can observe the intrinsic factors, such as gaining fulfilment, enjoying the activities or being altruistic and extrinsic factors, such as building social interactions, gaining on reputation or status and expecting future returns [31]. Therefore, sustaining motivation and engagement requires more than just training. CS practitioners should establish good relationships with citizen scientists and a continuous communication as well as the conditions for citizen scientists to meet and work with each other. We argue that essential to the project's success is building a strong community. Utilising online community spaces, social media, organising workshops and training as well as local meetups, collaborative and other social activities facilitate community building. Strong community in exchange encourages participation, promotes knowledge sharing, foster collaboration and builds on sustainability of the project [32, 33].

5 Bridging ESM, PS and CS with empirical phenomenology

The key to integrating the practices of Citizen science, Personal science, and Experience Sampling research lies in the concept of a methodological turn developed in the field of empirical phenomenology [8]. In experience research, the observed is the observer, meaning that the only access to the phenomena of interest is through the observer's subjective experience. If the observer does not adopt an attitude of curious exploration and engage in epoché, meaning bracketing the natural attitude, the judgments, interpretations, and explanations of their experience, we cannot obtain data on the genuine experience as it unfolds in life. This notion is rooted in phenomenological reduction, a

method of research into experience developed by Edmund Husserl [34]. Experience Sampling has been used to study subjective experiences in real-time contexts, but integrating it with phenomenological reduction enhances the depth of data on lived experiences [35]. Therefore, it is necessary to consider our participants as co-researchers. This attitude allows us to engage them in a way that fosters their interest in the research question which facilitates the methodological turn where the research question becomes in a sense their own and they become researchers of their own experience. While providing the support and means for investigation, it is important to give co-researchers the freedom to explore the research question and their experience in a way that is meaningful to them, and to encourage critical discussion. By opening up the space for co-creation of the research design and enabling co-researchers to actively contribute their findings, we facilitate a deeper reciprocity of knowledge transfer.

6 The pilot study "Luna"

Citizen science project Luna aims to explore the lived experiences of menstrual cycles and their impact on everyday well-being. We use a diary method for daily reports and Experience Sampling Methodology (ESM) to track experiences throughout the menstrual cycle with the use of the ESM mobile application Curious (about) consciousness or Curious in short.

We adopted the iterative co-creation approach to develop our research, combining the principles of ESM research, CS projects, PS and empirical phenomenology. This makes our research process flexible in a way that the research design is being updated in an iterative collaborative manner. We engage co-researchers in the design and assessments of data collection procedure and questionnaires, data interpretation as well as analysis. By encouraging them to develop their own research questions which are relevant to their own experience we promote their personal endeavor in the research. They are also involved in other project activities, such as sharing results and designing the project visual identity. We organise different learning and sharing community activities. In the training workshops we introduced them to the principles of observing ones' own experience, how to bracket the natural attitude and report on the pristine inner experience. On our online community space as well as in the organised meetups we share feedback on the research and their participation, engage them in the conversation on the research topic related questions and encourage them to share their own feedback. They are also invited to share any findings they have along the way in the mobile application. The Curious app is designed in a way to support co-researchers in their data interpretation by providing them with simple visualisations of their gathered data which they are able to filter, compare and reflect on. Our aim in the research is two-fold. It is driven to answer the research questions on phenomenology throughout the menstrual cycle as well as to equip co-researchers with methods and tools to research their experiential landscape and gather self-knowledge. Project tries to go beyond research by also opening up the data driven discussion on possible systemic or social solutions to consider the physiological and phenomenological cyclic nature of people with menstrual cycles. This also presents a motivational factor for some co-researchers who would like to see positive (societal) changes in regard to this phenomenon.

7 Conclusion

We argue that a large number of research questions in ESM research could be better investigated if research projects adopt the CS framework with an emphasis on community building, account for the interest and practice of PS, and use the principles of experience investigation from empirical phenomenology. The challenge of participant burden in ESM research is then mitigated by creating conditions for co-researchers to be involved in personally meaningful activities, which in return provide a higher level of data validity. Even though considerable resources are needed to establish these kinds of project communities, we believe they have the potential to be more sustainable. From CS, we know that citizen scientists develop a sense of community, which encourages them to remain active in science after the initial project ends [36, 37]. This interdisciplinary integration of different research practices enhances the value of our investigations and creates more impactful and sustainable research projects that benefit both the scientific community, involved co-researchers and the society.

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