

Subversive Participatory Design: Reflections on a case study

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ABSTRACT

This paper grounds in a research experience for engaging older people as co-designers of several wearable and in-house technologies. We start by describing a case study that is a pre-commercial procurement aimed at developing innovative services for the welfare of citizens, with a focus on older people. We present and discuss the qualitative data gathered on the occasion of a bodystorming with two groups of participants. The analysis led to the identification of the “aesthetic appropriateness”, the “social sensitivity”, and the “gender awareness” as three different dimensions that affected the acceptability of the technological devices. This approach created the conditions for instantiating the subversive power of participation. At the same time, such a subversion proved the authenticity of the participatory process. By drawing on this project, the purpose of the paper is to further our understanding of the conditions for Participatory Design.

CCS Concepts

- **Human-centered computing** → **Participatory design**
- **Social and professional topics** → **Seniors**
- **Applied computing** → **Health care information systems**

Keywords

Ageing; Assistive technology; Bodystorming; Stereotype; Subversive/Subversion

INTRODUCTION

To specifically define what “elderly” means is a subjective concept. The term can vary to take into account not simply a threshold or age based definition but could include physical and cognitive capacities or the ability to live independently. With this in mind we begin to see that the “elders” category is almost as broad as the “human” category, spanning all possible sorts of differences, including culture, social context, family ties, economic status, etc. In addition, we are immersed in stereotypes that associate “elder status” with difficulties and negative connotations, contrary to how the elderly are characterized in some non-western cultures. In general, we (elders or otherwise) are quite sensitive to social stigmatization, particularly those deriving from negative stereotypes.

This situation was the starting point for the reflections that we present in this paper: a group of elders invited to a workshop to validate a technological device which was, ostensibly, to improve their day to day life. Yet, the workshop aims were voided and it was underlined that the technology proposed was promoting stereotypes on aging. The context, as we detail in

Section 3, was a pre-commercial procurement project aimed at supporting elders’ to be more autonomous. The participants in the above mentioned groups *subverted* the program of the activities moving from evaluating a device to starting the design of a better suited one. We discuss this case as an example of the (positive) subversive power of participatory processes, even beyond the researchers’ plans. In this paper, indeed, the concept of subversion refers to the participatory process, not to the goal of participatory design.

RELATED WORK

Care systems are generally based on the understanding of ageing as a medical and economical problem to solve [9]. The basic idea is that design and use of special solutions can enable an active and healthy ageing process. When following this medical model, designers tend to be focused on notions of physical and cognitive decline, reproducing negative stereotypes on elders [5] [14] [15].

Furthermore, according to this perspective older people’s contribution is limited to a passive evaluation of pre-defined technologies. On the contrary, Participatory Design (henceforth referred to as PD) fosters the engagement of people as co-designers from the ideation phase by eliciting their creativity and criticism as well. As in our case study, a critical stance can positively affect the design by allowing the emergence of the participants’ perspective and creativity as fully legitimate elements of the process.

We maintain that the older people’s active participation in a design process is the condition for subverting possible stereotypes as, for example, the idea that the ageing population is a homogeneous group in need and seeing this group as a market for functional (technological) aids that are often of poor quality [2].

In the Interaction Design field some authors have elaborated on subversive design strategies such as design artefacts [10] or methods [11] for eliciting or provoking participants’ reactions. In PD, a subversive stance has been bounded to a historical and political dimension of a design project. Furthermore, subversion as a goal of PD has been broadly considered, both in terms of public engagement and social activism [1] [8], to rebalance the power dynamics [13]. In our work we take different perspectives, focusing on subversive processes happening within the participant group.

CASE STUDY

The case study refers to the SUITCASE-Sustainable Integrated & Territorial Care Services project. It was an Italian pre-commercial procurement, spanning a two-year period (2013-2015), aimed at developing innovative services for the welfare of citizens, with a focus on older people. Project partners included business partners

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Fig. 1. A participant tests the belt during the first workshop.

(several companies developing the IT outputs), research partners (the Economy, Sociology and Computer Science departments of University of Trento) and a sponsor (Trento Rise that was a public innovation cluster).

The target users of the project were healthy, over-65 citizens living in the urban area of Trento in the north of Italy. Such a profile corresponded to retired people and it was defined according to the project's objective: to improve the conditions needed for people to live safely and independently in their own homes for as long as possible. Furthermore, people should be able to autonomously participate in the development and testing of several wearable and in-house technologies for their health and wellbeing. The technical outcome of the project was a platform. It relied on a contact center designed to provide support in case of emergencies or risky situations (e.g. falls, gas and water leakages, smoke, and intrusions). Such interventions were mediated by several environmental sensors installed at home, a set of mobile apps, and wearable sensors. In order to design, test, and evaluate these technologies and services, a number of research activities were performed. Remarkably, these activities entailed the adjustment of technologies available on the market, according to the cost-saving approach of the funding bodies.

3.1 Research activities

Participants. The project aimed to involve forty older people per year. Volunteers were selected with the help of local associations and cooperatives. Research activities gradually involved all the participants while increasing their engagement. At the beginning nineteen people were interviewed to understand their habits and possible needs. At a later time nine seniors were involved in two scenario-based design meetings for discussing eleven service-proposals. Eight contextual interviews were then run in the participants' homes to evaluate the environmental sensor prototypes. Similarly four participants were invited to experiment a panic button for six weeks and evaluate it later in a participative game-session with thirty usability cards designed specifically for the project. Finally, two groups of six older people participated separately to a workshop focused on the fall detection service-prototypes. Several volunteers contributed to more than one research activity so that we met twenty-seven people overall (21 women and 6 men).

Focus. This paper draws on the two hour workshops related to fall detection prototypes: the older people's reactions to such artefacts raise an interesting discussion on the subversive power of and within PD processes. The first meeting took place with five people



Fig. 2 Bodystorming during the first workshop: belt and pouch are tested by the participants.

(2 females, 3 males aged between 66 and 76; another invited female withdrew) and the second was held with six people (1 male, 5 females aged between 66 and 85).

The participants were project volunteers selected according to their interest in being involved. The associations and cooperatives supported this process. The general purpose was to engage the seniors in a discussion about different fall detection technologies: the first workshop was focused on a smartphone that can be worn by a special belt (see Figure 1) or a pouch which fixes to a standard belt (see Figure 2), and the second referred to the smartphone working in connection with a smartwatch (see Figure 3). Both meetings relied on several steps depending on the devices used as design probes for prompting the participants' interaction. The groups started with a user journey map and then they were engaged in co-designing the interface of the smartphone. A bodystorming (see next section) closed the meetings.

Data. We collected a large amount of qualitative data but a full analysis and a discussion are out of this paper's scope. Here we focus on narrative and visual data. With the participants' consent, the bodystorming session was audiotaped. Furthermore a researcher videotaped the activity, while another acted as facilitator. Data were reviewed according to a grounded theory approach so that repeated ideas became evident and finally grouped into categories [3]. These data proved to be a valuable source of hints for delving into the participatory process while letting the age-related stereotypes come out and enabling the participants to "subvert" them creatively [6] [7].

METHOD

Bodystorming is better known as an interaction design method used by designers to gain deep understanding of a situation and to act from different predetermined roles in the specific situation [4]. However, we *revised* the bodystorming method "in the spirit of PD" [12] by defining it as design sessions carried out with real users in an original context instead of an office. From this perspective bodystorming grounds on a substantial involvement of participants who generate ideas while interacting with designers [10] as in SUITCASE.

In this project the bodystorming aimed to understand the acceptability of the technological proposals (i.e. smartphone or smartwatch) and the related supports (i.e. belt or pouch). Due to the project deadlines and the seniors' availability, it was impossible to perform the bodystorming in real-world situations, so we decided to use a room of the local University. As a matter of fact these technologies should work in any location, and at the time of research some of the participants were attending courses



Fig.3. Testing the smart watch during the second workshop.

of Computer Science in that University. Thus, the room represented a possible real-world site of use where a fall could occur. It is noteworthy that before the bodystorming session the older people worked on a user journey map that contributed to placing them in relevant scenarios. Accordingly a mental model of the design issue was built before the final session. Such a sequence of activities helped to tackle the limits of bodystorming in a fake environment.

Each group of participants was provided with the devices and invited to interact with them while openly commenting on all aspects they believed deserving of attention. Such probe tools prompted the discussion along with a number of researchers' questions basically devoted to understanding the participants' interest in the future use of those services.

DATA ANALYSIS

Due to the characteristics of the verbal interaction (i.e. a frequent overlapping of the participants' voices) the recordings were not fully transcribed. The visual data complemented the coding process to ensure that the findings were rich, robust, comprehensive, and well-developed. The researchers worked separately and then compared and reconciled their interpretations. According to the grounded theory, three categories were identified such as the "aesthetic appropriateness", the "social sensitivity", and the "gender awareness". Such themes referred to dimensions differently affecting the acceptability of the devices. Participants commented on them one by one, by highlighting possible aesthetic, social, and gender issues. Comments and proposals of alternative solutions contributed to subvert a stereotypical image of older people as compliant, frail, and technologically inexperienced.

Belt. The aesthetic characteristics of the belt such as the color (i.e. electric blue), the size (i.e. covering the abdomen), and the material (i.e. a synthetic fabric) were severely criticized by the first group as signs of a poor and stigmatizing design. One of the male's behavior is remarkable: he crossed his legs and arms and rejected the use of that belt as socially penalizing (see Figure 2; link to a video clip: <https://goo.gl/8kyMje>). All participants agreed that such a support was unsightly and in contrast to their style. Furthermore they said that the fabric of the garment could cause unpleasant consequences (i.e. an embarrassing perspiration, mainly during the summer). Only its elasticity was appreciated for making the belt easy-fitting. A participant ironically commented that the aspect of the belt could be improved by embroidering it (see Figure 1; link to a video clip: <https://goo.gl/Pc2fsV>). Any comments about the belt were expressed from a gender perspective.

Pouch. Similarly, the pouch (black and wearable with a normal belt) was judged uncomfortable especially in a sitting position as a man demonstrated (link to a video clip:

<https://goo.gl/jF6bgm>). Compared with other devices, this one was described as gender blinded whereas its aesthetic appropriateness and social sensitivity did not cause negative comments. For instance a female participant stressed that an older woman used to wearing gowns (or indeed wearing clothes other than trousers) would be disadvantaged by such a design.

Smartphone. According to the participants of both groups, the smartphone was not handy because of its size (137x70x8 mm) while a possible smartwatch would be a better choice and a working device as well: it is noteworthy that the first group was not informed about the device (i.e. the smartwatch) given to the second group and vice versa. In this case, the aesthetic inappropriateness constrained the usability as well, causing one of the males to question the participants' design space by saying: "Did you decide the size of the smartphone yet? [In that case] there is nothing to discuss". Another male suggested that a good idea would be to design a pedometer with a fall detector so that the size requirement could be satisfied and the portability too.

Similarly, one of the females suggested adjusting an existing technology like her iPod shuffle by transforming its big central button into a panic button easy to find and press in case of a fall. Furthermore she said that it would be pleasurable, even though more expensive. An older woman explained that a smartphone would cause problems for a person used to working outdoors (e.g. for gathering firewood) as many people do in rural areas near Trento. Thus, this comment suggested a scarce situatedness of the device meant as its misalignment with the use context.

Smartwatch. The matter of concern about the smartwatch was less from the aesthetic, social, and gender perspectives and more from a functional viewpoint (i.e. a poor performance of the speakerphone and a waiting time considered too long for communicating with the contact center in case of emergency). As a matter of fact the debate in the first group was much more heated and focused on non-technical aspects.

DISCUSSION

The term "subversion" is adopted here in a positive and constructive sense [6] for describing the powerful dynamic of the participatory process enacted by a revised version of the traditional bodystorming method. Two groups of older people were invited to interact with several objects and technological devices for the fall detection. Such an interaction was expected to shed light on the acceptability of these project outcomes. However the participants performed a subversive behavior. We don't mean a mere "here and now" refusal to act according to the expectations. Their subversion did not intend to compromise the quality of research. As a matter of fact they voluntarily participated in the workshop because they were interested in technologies for fall detection and that was their main concern. The seniors elevated their own perspective above the design framework, by rethinking expectations and interpretations about older people as users. We define *subversive* as a proactive behavior that occurs in participatory designing: such a behavior re-configures the relationship between researchers-participants. From this processual perspective, subversion refers to *PD in the making*: a subversive behavior cannot be predicted because it pertains to a genuine, legitimate bottom-up participation in design. By deconstructing a number of stereotypes, the participants appropriate the design process. They subverted a dominant "age" order according to which older people are compliant participants of design processes. By taking a proactive and ironic stance, they brought into question both the acceptability of the devices and the project overall.

The bodystorming exposed not only the materiality and functionality of the devices but it also brought their symbolic

traits (i.e. aesthetic, social, and gendered) under investigation. The sociomaterial “overexposure” of the devices encouraged the participants to be reflexive. During the workshop the conflict between the seniors’ personal perspective (i.e. self-image, life-style, and inner sense of being) and the design pattern became increasingly evident. Instead of being compliant, the participants acted (i.e. handling and wearing the devices) and reacted by challenging the age-related stereotypes (i.e. seniors as technologically inexperienced, passive users, and frail people) and subverting a dominant stigmatizing design for older people (i.e. assistive, unfashionable, and unpleasant). Subversion was performed both discursively and physically. Some people extensively expressed their opinion, others preferred a meaningful silence; some people interacted with the devices, others visibly rejected any contact with them. Critical sensibility, irony, and creativity were the strategies that pervaded the participants’ way of being and doing. For instance, they found the humor in wearing the belt and they uncovered the limits of the project design space but they displayed their proactivity in suggesting alternative solutions.

The participants’ re-actions were noteworthy in that they expose a gap between a dominant design for older people and the design expected by this part of the population. The subversive power of such a behavior goes beyond the local project and the relationship with the researchers. The participants subverted a wider design framework.

The seniors proved that today’s older population can also be fit, healthy, independent, and tech-savvy. They showed a valuable knowledge grounded in their personal experience with several devices (e.g. the pedometer, the iPod shuffle) so that the stereotype of seniors as uninterested in technology was also questioned. The interaction with the devices shed light on the importance of combining functionality, usability, and aesthetic also in the design for older people. The aesthetic appropriateness extends the meaning of what constitutes “pleasure” and “emotional” content to the concept of well-being: there is no technological reason why the needs of older people (i.e. assistive technology devices) should be ugly and stigmatizing as the electric blue belt.

CONCLUSION

Instead of regarding subversive subjects as the enemy, this research experience shows that we ought to see them as potential allies in the effort to conduct ethically and scientifically sound PD experiences. Subversive subjects are agents that take the relationships with experts seriously and contribute to the design process with their legitimate concerns and values. However, there are relatively few studies that adopt measures to detect rule-breaking, so that the subversive behavior often goes unnoticed. Future research should address this gap.

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