

Does Roleplaying Facilitate a Holistic Perception of the User? An Exploratory Study on Simulating the Elderly Experience

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Empathy is an essential skill for user-centered design, as it can give access to users' perspective to create more usable products and services. Roleplaying has been proposed as a tool to facilitate empathy in the design process, but the effectiveness of this technique is not yet so clear. In this preliminary study, we assessed the effectiveness of roleplaying in acquiring a more holistic perception of elderly people by simulating everyday activities in a roleplaying exercise with 15 undergraduate students. We will present the results of this exploration as well as propose new questions and directions for future work regarding the use of roleplaying in user-centered design.

Keywords: *Empathy, schema, Roleplaying, Elderly people, Props.*

1 Introduction

Empathy refers to the process of understanding what another person is experiencing by applying perception or imagination to access a similar affective state (Baron-cohen & Wheelwright, 2004). This skill gained relevance in user-centered design as it can enable a better understanding of users (Gaver, Dunne & Pacenti, 1999; Kaufman & Libby, 2012; Koskinen, Battarbee, & Mattelmäki, 2003; Kouprie, Visser, 2009), which provides insights to make products and services more usable, besides helping to frame new design opportunities (Koskinen et al., 2003; Leonard & Rayport, 1997).

To date, different techniques have been proposed to facilitate designers' understanding of users. One set of techniques rely on data collected directly from users by observing, interviewing (Kobayashi et al., 2011), and co-creating with them (Gaver, Dunne, Pacenti, 1999; Demirbilek & Demirkan, 2004). Other techniques collect data from the designers' own experiences through roleplaying. An example of roleplaying is Patricia Moore's empathy experiment (Moore & Conn, 1985) in which she dressed like an elderly woman to go through her daily experiences for almost three years. This experiment enabled Moore's broader understanding of what it meant to be an elderly person in an urban environment and to design many products based on this experience. However, since this technique involves

extensive periods of collecting and analysing data, it would be inconvenient to use it on short design projects. Other roleplaying techniques, such as age simulations (Brock university, 2017; The Change Foundation, 2017) and experience prototyping (Buchenau & Suri, 2000), have been proposed to overcome this downside, allowing designers to approach users in more resource-efficient ways.

Roleplaying techniques aim to complement designer's perceptions of users, which are based on designer's personal experiences and knowledge, with the ones acquired after a simulation of users' experiences. However, these techniques present other constraints since they are perceived as unsystematic and often misunderstood (Buchenau & Suri, 2000; Carey et al., 2017). Furthermore, the extent to which these tools facilitate a more holistic perception of users (i.e., acquiring a more complete understanding of the users' experiences in comparison to a more stereotypical one (Fiske, Cuddy, & Norton, 2005; Hummert, 2011)), is not yet so clear.

Addressing this gap, we conducted a roleplaying exercise in which 15 undergraduate university students simulated elderly people's everyday experiences by using various props (i.e., earplugs, gloves, glasses and ankle weights). We assessed roleplaying's effectiveness by comparing the schemas about "*being an elderly person*" the students had before and after the exercise. Schemas are mental representations on how someone perceives and makes sense of a complex environment (Axelrod, 1973), including objects, people and their context. Individual's existing schemas get constantly updated with new incoming information to develop new interpretations of these environments (Axelrod, 1973). So far, schemas in design have only been studied from the user's perspective (Hurtienne, Klöckner, Diefenbach, Nass, & Maier, 2015), conducting studies to make products more understandable and approachable for users' schemas. Diverging from this work, we set out to understand how roleplaying, as a design research technique, influences designers' existing mental representation about users. In this paper, we present the results of this roleplaying exercise, and propose new questions and directions for future work.

2 Roleplaying Exercise

We organized the roleplaying exercise as part of an event related to accessibility, human dignity and people with disabilities conducted at our university in November 2018. The event was open to all university students. 15 students, between 20-25 years, signed up through the event website. They were students from media and visual arts, industrial design, computer engineering, psychology and business administration who had previously taken basic design and design thinking courses. The exercise lasted for two and a half hours during which students formed teams and enacted different everyday tasks of an elderly person. As the exercise was held at the university campus, we chose these tasks accordingly (Table 1).

Table 1. Description of tasks for each team

Task	Description
1	<i>Search for a book on the library's web page and go to the library to borrow it</i>
2	<i>Go to the minimarket, search for grocery and buy it on the self-checkout</i>
3	<i>Go to the garden, take a picture with a mobile phone and send it by email</i>
4	<i>Put on a shirt and shoes with laces. Then, sew to fabrics together</i>
5	<i>Call someone to chitchat and read a newspaper article to another elder participant</i>

Each team was composed by three students, each of which was assigned a different role to simulate: an *elderly person*, a *caregiver*, or an *observer*. The purpose was to discover whether playing different roles would create a different impact on participants' schema about elderly people. The participants playing the role of the *elderly* had to accomplish one of the tasks listed in Table 1. During these activities they wore props to experience some sensory barriers that come with aging, such as diminished sight, diminished mobility and diminished hearing (Fig. 1). The task of the *caregiver* was to prevent the elderly from suffering accidents and could only intervene in case of a safety issue. The *observer* played the role of a researcher, making observations about the user and was required to fill out two templates with information collected during the exercise. The first template was a journey-map linking activities performed by the elderly to the emotions expressed while carrying them out. The second was a guide to define the identified problems, painful situations and possible points of intervention.



Fig. 1. Props used to simulate the elderly experience and student's wearing them.

2.1 Assessment Method

Assessing the extent to which this roleplaying exercise influenced students' schemas about elderly people, we compared the mental representation they had about "*being an elderly person*" before and after the exercise. We did this by asking each participant to write five words they associated with elderly people at three different time points: before the exercise, right after the exercise, and a month after the exercise. At each time point they had 2 minutes to write down the words.

These words reflected participants' schema at those moments (Kawakami, Young, & Dovidio, 2002). We asked if there would be a change in the words selected before and after the exercise, and if the direction of this change would reflect a shift on how the participants perceived elderly people. We collected 225 words, 140 of them were unique, 85 were repeated. We first clustered the words applying affinity diagramming (Hanington & Martin, 2012; Kawakita, J., 1991) thus we obtained 5 different dimensions related to the words selected: *appearance*, *behavior*, *character trait*, *context* and *feelings* (Table 2).

Table 2. Dimensions and their definition

DIMENSION	DEFINITION
APPEARANCE	to what extent the word makes reference to the elder's outward aspect.
BEHAVIOR	to what extent the word makes reference to how the elder conducts him or herself.
CHARACTER TRAIT	to what extent the word makes reference to personality characteristics
CONTEXT	to what extent the word makes reference to situations elderly people live.
FEELINGS	to what extent the word makes reference to feelings of elderly people.

We asked 52 undergraduate students, from the same departments and with similar demographics, to evaluate how the collected words were related to these dimensions (Table 2). Filling up an online survey, these students rated on a 5-point Likert Scale to what extent each word was related to the aforementioned dimensions (1: not related – 5: highly related). Thus, each word obtained an average score for each dimension. For instance, the word *soft* was more related to *appearance* (average 3.85) than *feelings* (average 2.62) (Table 3).

Then, we recreated each participant 'schema for each time point (Table 3) by applying these scores to the set of words selected by each participant. With this, we obtained an average score for each dimension per participant. As an example, a participant having set of words with more *appearance* related words would get a high score on *appearance* dimension, and a lower score on other dimensions.

Finally, we assessed the change in schemas for each time point for all participants and across roles (Fig. 3). Our aim was to explore whether the roleplaying exercise led to a more holistic perception of elderly people, which was characterised by schemas having a more evenly distributed rating of dimensions, as opposed to a more stereotypical perspective, characterised by schemas having a dominant dimension.

Table 3. Example of a participant's schema before and after the workshop. Table shows the selected words and their rating on each dimension, and arithmetic mean for schema. AP: appearance, BH: behavior, CT: character trait, CO: context, FE: feelings.

Before the workshop					After the workshop				
AP	BH	CT	CO	FE	AP	BH	CT	CO	FE
Bruised					Lonely				
3.50	2.65	2.31	2.88	2.88	3.17	3.08	2.92	3.54	3.79
Insufficient					Wisdom				
3.5	3.32	2.55	3.09	3.14	3.48	3.67	3.81	3	3
Soft					Harder conditions				
3.85	2.73	2.73	2.62	3.08	3.23	3.32	2.73	3.55	3.05
Slow					Not understood				
3.35	3.69	2.85	3.19	2.5	2.8	3.5	2.6	3.05	3.2
Irritated					Cautious				
2.83	3.67	3	2.75	3.5	3.23	3.88	3.65	3.38	3.31
Arithmetic mean					Arithmetic mean				
3.41	3.21	2.69	2.91	3.02	3.18	3.49	3.14	3.3	3.27

3 Results

3.1 Recurring schemas of the elderly

Regarding individual choice, we observed 2 main schemas before the workshop. *Appearance-dominant schema* corresponded to a higher average on *appearance* and lower average on *feelings* and *character trait*, whereas, *behavior-dominant schema* corresponded to a higher average on *behaviour*, and lower average on *feelings* and *character trait*. After the workshop, we observed an increase in *feeling's* average for both schemas. The other dimensions changed differently, presenting more similarities within teams than in-between teams.

3.2 Overall

Comparing the selected words across all the participants, the roleplaying exercise appears to lead towards a more holistic perception of the elderly. Comparing student's schemas, while *appearance* got the highest average across all the participants (3.18) before the workshop, after the workshop *behavior* (3.04) acquired the highest average, followed by *context* (2.96) and *feelings* (2.91) (Fig. 3). In addition, a month after the workshop *behavior* still had the highest average (3.13) followed by *appearance* (3.03). This means that the roleplaying exercise helped students to acquire a more holistic perception by integrating new information on dimensions that initially got a lower average and, also, by leveraging the other dimension's averages.

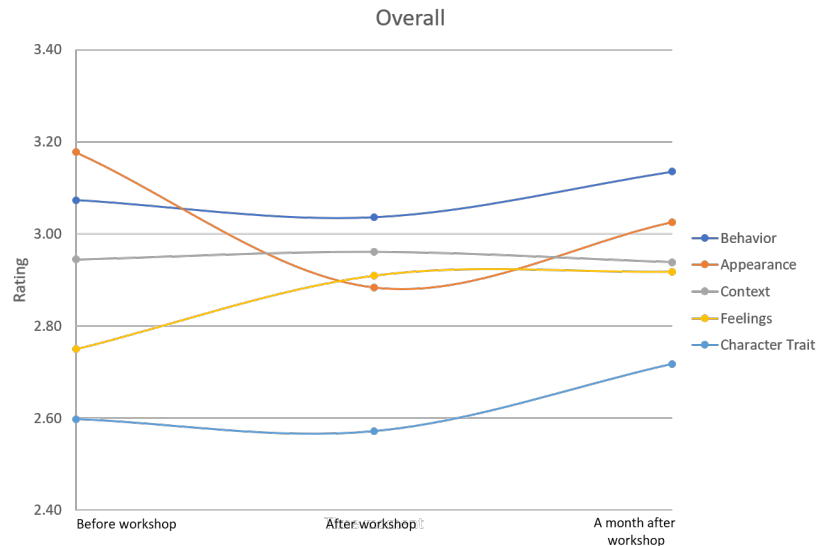


Fig. 2. Dimension's averages per time moment. 1: before workshop, 2: after workshop, 3: a month after workshop

3.3 Across roles

Comparing the schemas across roles, we found different effects related to the highest scored dimension (Fig. 4). While before the workshop *appearance* obtained the higher average for *elderly* and *observers*, after the workshop and a month after the workshop, *behavior* had the highest average for the same roles. Diverging from this pattern, *caregivers* maintained a higher score on *behavior* for the three time points. With this, *caregivers*, who had a less active role as they could intervene only in case of safety issues, seemed to be less impacted by the exercise.

Comparing number of dimensions that increased their rating after the workshop (Table 4) the *elderly* role presented an increase on the rating of 4 dimensions, *observers* on 3 and *caregivers* on 2. Which also supports the idea that different roles experienced differently the roleplaying exercise. Also, after the workshop, all roles experienced a decrease on *appearance-related* words and an increase on *feelings-related* words, which reflects a more empathic approach towards the user. Finally, for all roles, *character trait* presented the lowest rating on the three time points, which could suggest that not all dimensions of the elderly people's life are equally accessible through roleplaying.

Fig. 3. Composition of schemas per role and per time point.

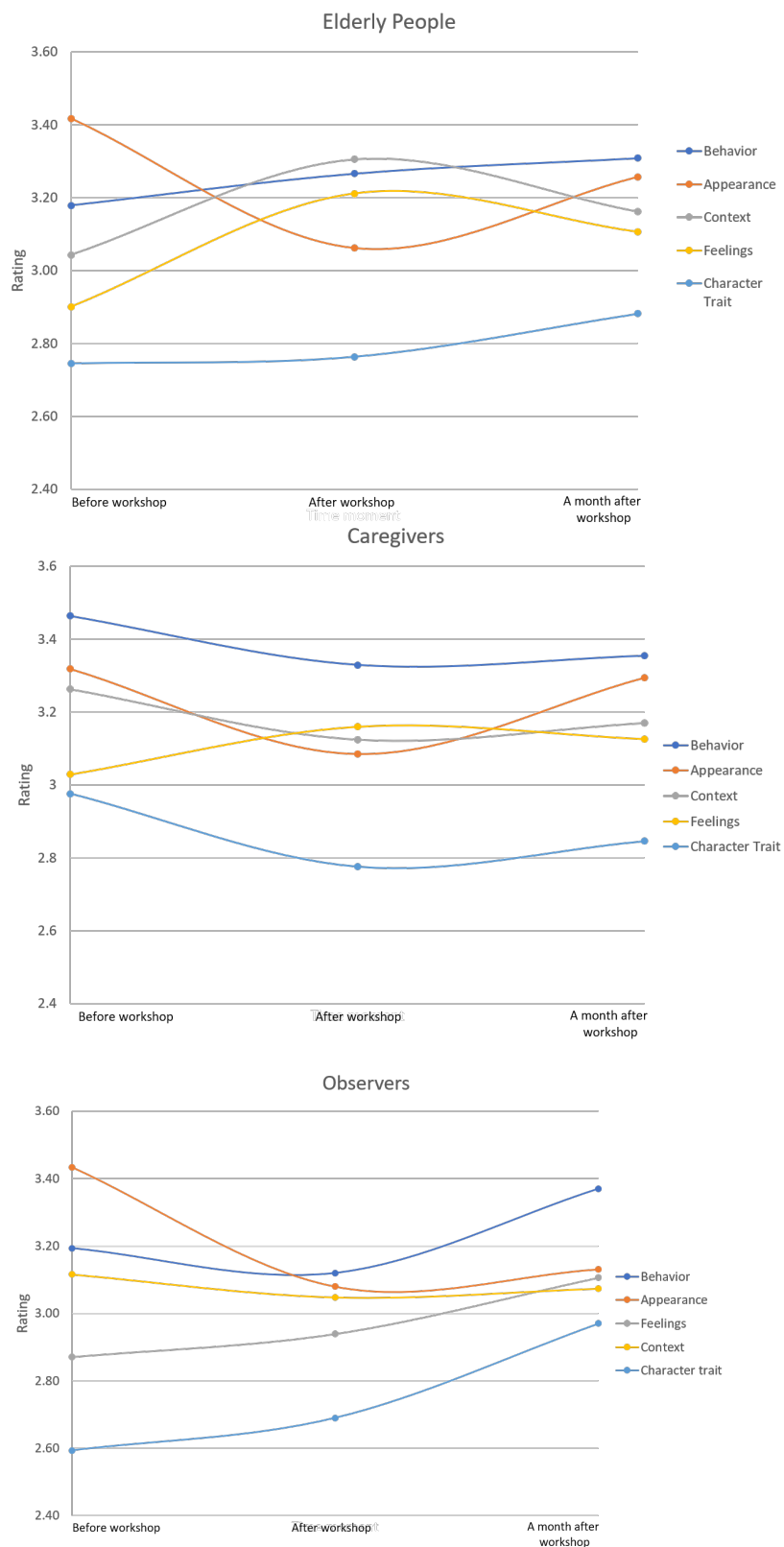


Table 4. Change in the average rating of each dimension, per time moment, per role. AW: after workshop, MW: a month after the workshop.

Dimensions	Elderly		Caregiver		Observer	
	AW	MW	AW	MW	AW	MW
Appearance	↓	↑	↓	↑	↓	↑
Behavior	↑	↑	↓	↑	↓	↑
Character Trait	↑	↑	↓	↑	↑	↑
Context	↑	↓	↓	↑	↓	↑
Feelings	↑	↓	↑	↓	↑	↑

4 Discussion and Conclusion

Empathizing with users is essential when designing for the elderly. Previous work has developed theories and various tools to achieve a more holistic perception of the user (Carey et al., 2017; Detweiler, 1980; Kaufman & Libby, 2012; Koskinen et al., 2003). In this paper, we aimed to assess roleplaying in terms of the extent to which it can help designers achieve a more holistic perception of elderly people. Below, we revisit the three important findings of this work along with new questions indicating novel research directions for design researchers.

First, we observed that using props to simulate the elderly experience can help design teams have a more holistic perception of the elderly people. We initially observed 2 main schemas before the workshop (i.e., *appearance-dominant* and *behaviour-dominant*), which changed into more balanced ones. Thus, such exercise can be useful when designers' initial schemas are *appearance/behavior dominant*. But, this might not directly transferable to other schema types. Also, we observed that schemas changed differently in regard of the activities, so different roleplaying activities might help achieving different schema types. The latter makes us think that, evaluating schemas pre-roleplaying can be beneficial to select the roleplaying activity in accordance to reach a more holistic perception of the user. As it was stated, schemas get updated when new information arises. As the roleplaying activity determines the experience, it also influences the new information that will be integrated to schemas. In this sense, we could speculate that some activities are more related to some dimensions than others. Thus, if the designer present a schema that *appearance-dominant*, then a roleplaying activity that is highly related with *feelings* could have a bigger effect on this dimension, while an activity highly related to *appearance* (e.g., *shopping clothes, dying their hair*) would lead to increase *appearance* dimension. Regarding this point, a new research question is:

- a. how can we match the roleplaying activities with designer's existing schema to reach a more holistic perception of the user?

Second, the results indicate that dimensions present different changes, for example *character trait* had the lower increase for all roles and for all time moments. So, not all dimensions of the life of elderly people are equally accessible through this tool. Also, we observe that *appearance* tends to decrease when other dimensions increase, for example in

the case of *feelings* that consistently increased. Finally, the effect of roleplaying is not necessarily maintained for all dimensions after a month (Table 4). These observations triggered new research questions. These are,

- a. how can we facilitate designer's accessibility to all the dimension of the user's life and maintain it through the design research process?
- b. how can we refine and complement roleplaying to facilitate a more balanced distribution of "*hard-to-reach*" dimensions (e.g., *character trait*)?

Third, we discovered that the different roles experienced roleplaying differently regarding their immersion level. For example, participants who had the role of the *caregivers* seemed to have been affected less by the roleplaying experience. This implies that a holistic perception may not be directly transferred to other members in the design team. Regarding this point, we propose the following research question:

- a. how can we share, with each member of the team, the holistic perception reached through this experience?

5 Limitations and future work

This work has limitations. For example, the experiment was experimental in nature and was not done with professional designers and it was only related to elderly people's experience, thus the results may not be generalizable. Thus, our future explorations will address these issues, along with further developing schema development and its impact on the design process.

We will continue this work by focusing on the research questions raised above. We plan to apply roleplaying exercises to contexts that present a bigger challenge to approach the user due to bigger social and cultural distance (Allport, 1954; Detweiler, 1980; Pettigrew, 1998) as in the case of undermined groups who are marginalized by conventional design practices (Pettigrew, 1998), for example when designing with and for refugees.

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