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A systematic validation of the Empathic Handover approach guided by five factors that foster empathy in design

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ABSTRACT
This study aims at validating the transferability of the Empathic Handover approach, which we originally developed for the co-design process of a dementia simulator. We argue that empathy in design is operationalised using five factors: emotional interest, sensitivity, self-awareness, personal experience, and mixed perspectives. This heuristic proved useful in systematically comparing the empathic capacity of design students using the Empathic Handover and traditional user research approaches. Our comparative study indicates that the Empathic Handover approach enables designers to develop empathy with vulnerable users they did not meet in person (both people with dementia and people who mourn). Additionally, the study enables us to develop an elaborate notion of the working mechanisms of empathy in design as well as practical improvements to the Empathic Handover approach.

1. Introduction

The work in this paper is set up in the context of empathic design (e.g. Leonard and Rayport 1997; Fulton Suri 2003; Koskinen and Battarbee 2003; Kouprie and Sleeswijk Visser 2009; Mattelmäki, Vaajakallio, and Koskinen 2014). Empathy is people's intuitive ability to identify with others' lived experiences such as thoughts and feelings, motivations, emotional and mental models, values, priorities, preferences, and inner conflicts (Fulton Suri 2003). Empathy enables designers to gain relevant and intimate user insights and deep emotional understanding, leading to more meaningful designs. It is a multidimensional and complex concept and has been labelled as a construct, process, individual ability, skill, internal disposition, intellectual virtue, and more (Hess and Fila 2016a).

Designers can find it challenging to empathise with users. This is especially true when only some of the designers on a team can meet, collaborate and connect with users in person. In design practice, this often occurs due to a lack of time or budget, the designers' capacity and willingness, and ethical considerations like burdening (vulnerable) users (e.g. van Rijn...

In the Empathic Handover approach, a principal designer (PD) collects user insights and empathically transfers these to design team members who did not meet the users in person. The approach consists of three sequential co-design activities facilitated by the PD. The first activity is the individual harvest (e.g. user research). The second is a collective handover (i.e. an empathic transfer of user insights to the design team). The third is empathic ideation (i.e. release first ideas with compassion).

In a single-case study about the Empathic Handover approach (Smeenk, Sturm, and Eggen 2017), experts evaluated the design outcome, a dementia simulator, positively (Hattink et al. 2015). The practical and coherent empathic process guided the design team and enabled individual team members to be receptive, inclusive and committed towards users whom they did not meet in person. These design attitudes are important meta-principles in design (Cockton 2009) and support empathy (Kouprie and Sleeswijk Visser 2009; Smeenk, Tomico, and van Turnhout 2016).

In this paper, we investigate whether other design teams can use the Empathic Handover approach and effectively apply it to a broader set of design problems and contexts. To this end, we conducted a comparative study in which we compared the Empathic Handover approach to other traditional user-centred design approaches in mourning and dementia contexts.

This paper is organised in four sections. In the first section, we will discuss the theoretical framework around empathy in design. In the second section, we will describe the comparative research study and present its results. Then in the third section, we will discuss the strengths and limitations of the Empathic Handover approach. Finally in the fourth section, we draw conclusions.

2. Theoretical framework

In this section, we present an overview of factors that foster empathy in design. Based on literature from social psychology and design, we propose a theoretical framework of factors that influence empathic growth with designers.

2.1. Theoretical framework

A rich variety of definitions of empathy exist in contemporary social psychology. However, most scholars see empathy as a process whereby ‘one individual comes to share another individual’s affective experience’ (e.g. Davis 1996; Batson et al. 1997; Bluck et al. 2013; Tani, Peterson, and Smorti 2014; Zahavi and Rochat 2015). Moreover, leading psychology theorists tend to agree that the essential qualities of an empathic experience are the ability to share emotional experiences (affective empathy), the ability to understand these experiences (cognitive empathy), and the ability to attune to or distinguish between self and other (Baldner and McGinley 2014).

Based on a variety of frequently used empathy scales (e.g. Interpersonal Reactivity Index, Empathy Quotient), Baldner and McGinley (2014) identified and conceptualised six underlying factors that are currently used to measure empathy. The first is ‘emotional interest’: people’s tendency to show interest in, and approach, others’ emotions (e.g. being aware
of your friend’s feelings). The second is ‘sensitivity’: people’s tact in social situations (e.g. being aware that somebody can be offended by a remark). The third is ‘perceived other awareness’: an individual’s perceived ability to comprehend and predict another’s emotional state, (e.g. is: being attentive of others’ state and able to imagine how they feel). The fourth is ‘personal distress’: which concerns an individual’s ability to avoid becoming emotionally over-stressed in negative situations (e.g. prevent losing control or going to pieces when someone needs help, or prevent feeling scared when you are with friends who do). The fifth factor is ‘perspective taking’: imagining how things look from another perspective (e.g. looking at everybody’s side of a disagreement before making a decision). The sixth is ‘emotion with fictitious characters’: being emotionally involved with fictitious characters (i.e. in stories, movies and television shows).

2.2. Empathy in design

There is widespread agreement that the ability to create meaningful concepts largely depends on the level of understanding and empathy that a designer or design team can gain for the users (e.g. Fulton Suri 2003; Koskinen and Battarbee 2003; Kouprie and Sleeswijk Visser 2009). Despite a growing recognition that empathy supports designers in projects that require great sensitivity (e.g. van Rijn et al. 2011; Smeenk, Tomico, and van Turnhout 2016; Smeenk, Sturm, and Eggen 2017), there is a limited body of knowledge on how to measure empathic growth in design (Hess and Fila 2016a, 2016b). Three recent attempts to better understand how empathy can be encouraged, developed and used are particularly relevant to the work described in this paper.

First, the comparative design research study by van Rijn et al. (2011) explored the influence of three modes of information (theoretical information, video and user contact) on the developed empathy in design for autism. They analysed the discourse of three design teams using four indicators of empathy: lingual empathic expression (e.g. saying ‘I think/feel/guess the users think/feel/want…’); own experience (e.g. relating users’ needs and experiences to the designer’s personal experiences or comparing them to users they personally know); question users’ needs and experiences vs. making (false) assumptions (e.g. realising one’s lack of empathy); and discussing user facts’ (e.g. spending time on user facts). All four indicators relate to the importance of acknowledging ‘self and other’ in empathic design; one indicator even explicitly includes designers’ personal experiences. However, these indicators are not explicitly grounded in theory.

Second, Hess and Fila (2016b) proposed a theoretical overview that conceptualizes empathy and the interrelationship between different empathy types. They use these to support the empathic growth of engineering students (Figure 1). Drawing from various knowledge domains (e.g. engineering, human-centred design, counselling, social psychology, moral philosophy and neuropsychology), four quadrants distinguish affective experiences from cognitive processes, and self-orientation from other-orientation. These quadrants, also called empathy types, are: empathic distress, empathic concern, imagine-self perspective taking and imagine-other perspective taking. Hess and Fila characterise empathy development as navigating through these empathy types: affective experiences lead to (empathic) cognitive processes and vice versa. This is represented with arrows in Figure 1. The four empathy types approximate the factors defined by Baldner and McGinley (2014). Yet, with
the exception of ‘empathic distress’, the overview does not incorporate designers’ own contextual experiences, which was introduced by van Rijn et al. (2011).

Finally, Smeenk, Tomico, and van Turnhout (2016) systematically analysed a case study about mourning to better understand the empathic value of employing three basic perspectives in design. They explain how applying a first-, second-, or third-person perspective enables designers to be receptive, inclusive and committed towards users, respectively. They argue that the designers’ first-person perspective may be a major contributor in projects that require great sensitivity. For example, in the mourning case, personal experience made a designer very motivated and committed to the project context and the users, and enabled her to develop solutions based on intuition. Moreover, this study shows how perspective clusters (i.e. sequential series of two or more perspectives) credibly and legitimately incorporated these relevant personal experiences and intuition. Intentionally employing and comparing their own and others’ experiences gives designers a conscious way to empathise and are indicators for designers’ empathic growth.

2.3. Factors impacting designers’ empathy

We propose using the model defined by Baldner and McGinley (2014) as a base, and complementing it with the insights from the aforementioned design theories to create a framework that supports our evaluation of designers’ empathic development in the case study. Since we intend to measure and compare empathic capacity in real-life situations and with real users, we decided not to incorporate the factor ‘identifying with fictitious users’ in our study. We argue that ‘identifying with fictitious users’ is more an imaginative stance and design tool (e.g. personas, storyboards, empathy maps) than an empathic state or a behavioural response. Moreover, there is no psychological proof that assessing peoples’ (and thus designers’) responses to scenarios is an efficient way to measure empathy (Baldner and McGinley 2014). Thus, in our framework for design, empathy is operationalized by five individual factors related to designers’ behavioural responses: emotional interest, sensitivity, self-awareness, personal experience, and mixed perspectives. These will be explained in more detail below.
2.3.1. Emotional interest (EI)

‘Emotional interest’ in design emerges when designers attune and attend to users’ emotions (and contexts) and is a deliberate cognitive choice. van Rijn et al. (2011) argue that a designer’s ‘motivation’ to learn about users is a crucial aspect in an effective empathic design process. Smeenk, Tomico, and van Turnhout (2016) describe this emotionally interested attitude as designers being receptive to users and context. By collecting existing user information (knowledge of others) through for instance multimedia research, designers imagine how others think or feel. Moreover, this factor can be recognised in the cognitive ‘imagine-other perspective taking’ empathy type of Hess and Fila (2016b). Designers study, interpret and imagine how users think or feel. Herewith, designers’ emotional interest grows.

2.3.2. Sensitivity (SE)

‘Sensitivity’ in design emerges when designers are in contact with users. van Rijn et al. (2011) did not explicitly identify this factor as an indication of empathy, but they mentioned the related concept of ‘willingness’. In Hess and Fila (2016b) the affective ‘empathic concern’ type is clearly related to sensitivity. Designers’ affect and tact in user encounters are important in two ways. First, designers think about ethical aspects in conducting and analysing user research, and in ideation. They respect the people they design for and with, are honest about expectations and possible design outcomes, and consider what can serve users’ situations (Robertson and Wagner 2012; IDEO 2015). Second, designers anticipate to inclusiveness in user research preparation. They consciously consider collaboration with an adequate range and number of users and choose appropriate design tools. Herewith, designers avoid excluding people, experiences and even perceptions.

2.3.3. Self-awareness (SA)

When designers intend to understand and predict users’ emotional states in current or imaginative future situations, they build hypotheses. This means they have to be very aware of bias (preconceptions and assumptions) and possible projection. As previously mentioned, all van Rijn et al. (2011) empathy indicators relate to the importance of acknowledging and distinguishing self and other. This cognitive process is also seen in Figure 1 of Hess and Fila (2016b), where designers imagine how they would think and feel if they were the user: ‘imagine self’. Smeenk, Tomico, and van Turnhout (2016) argue that designers should consciously take a neutral, receptive and open stance in approaching users, as well as a professional stance in developing tools and meaningful design outcomes. This requires self-awareness: both in design maturity and in personal traits. Designers interpret user facts and insights and translate these intuitively into ideas and concepts. Interpretation and intuition show the importance of ‘self’ in understanding and helping the ‘other’. This demonstrates that ‘self’ and ‘other’ can easily be intertwined in design processes. Therefore, it is important for designers to correctly distinguish between the representations of their own actions, perceptions, sensations and emotions, and those of users (e.g. Hollan 2012; e.g. one person’s bridge is another person’s boundary; Lamm, Bukowski, and Silani 2016). Along these lines, we perceive the original term, ‘perceived other awareness’, as distant and static; therefore, we rename this factor in ‘self-awareness’.

2.3.4. Personal experience (PE)

‘Personal experience’ in design emerges when designers connect to and reflect on their own relevant (positive and negative) experiences and emotions. Hess and Fila (2016b) limit their
self-oriented affective empathy type (‘empathic distress’) to an experience where designers struggle with distress as a result of feeling for another. Yet, design scholars (e.g. van Rijn et al. 2011; Smeenk, Tomico, and van Turnhout 2016; Smeenk, Sturm, and Eggen 2017) and psychologists (e.g. Bluck et al. 2013; Tani, Peterson, and Smorti 2014) claim that similar autobiographical experiences are also important in empathising. Consciously including and reflecting on their own experiences is meaningful for designers in two ways. First, designers’ co-experience with the user in conducting user research and emotional coping can become a problem. Since this distress focuses on the self, designers’ backgrounds (e.g. traits, gender, and nationality) and design maturity (attitude, knowledge, skills, experience) can influence designing and empathising. Second, when a designer is a person familiar within the design context his/her first-person perspective supports emotional user understanding, sharing affect and using intuition. Although sharing autobiographical memory can elicit empathy (e.g. Bluck et al. 2013) and foster a strong commitment to a design project, it can also cause distress (Smeenk, Tomico, and van Turnhout 2016); e.g. remembering a family member’s death. Even though this may motivate a designer to act and search for a solution, it may also frustrate the design process, since the sad memories can be overwhelming and prevent progress. Since researchers do not define empathy as only occurring in negative situations or emotions (Baldner and McGinley 2014), we consider the original term ‘personal distress’ to be too narrow and we propose the more neutral term ‘personal experience’.

**Figure 2.** An overview of factors that foster empathic capacity in design, inspired by Hess and Fila’s (2016b) overview and the empathy factors proposed by Baldner and McGinley (2014).
2.3.5. Mixed perspectives (MP)

'Mixed perspectives’ in design occur when designers take different point of views. In Figure 1, Hess and Fila (2016b) seem to limit perspective taking to a cognitive process where designers only imagine their own or others’ thoughts and feelings, although they also argue that navigating through the four individual empathy types (combining affect and cognition) is necessary for empathic growth. van Rijn et al. (2011) also showed that involving combinations of affective resonance and cognitive reasoning enhances empathy. Additionally, predefined perspective clusters led to a more accurate understanding of and empathy with users in Smeenk, Tomico, and van Turnhout’s (2016) study. Since empathy is a multifaceted phenomenon that can be described as a set of distinct, but related affective and cognitive dimensions that all interact (Davis 1996), we expand the original factor ‘perspective taking’ with affective aspects and rename it in ‘mixed perspectives’. Herewith, the mixed perspectives can be seen as the outcome of two or more empathy factors, but it can also be a distinct design strategy (Smeenk, Tomico, and van Turnhout 2016).

Combining the five factors described with the two dimensions defined by Hess and Fila (2016b), we present an overview of factors that foster empathic capacity in design (see Figure 2). This theoretical framework will guide us in the comparative case study in the next section.

3. Comparative case study

In this section, we first describe the Empathic Handover approach. Then, we introduce the comparative case study, in which we compare this approach to traditional user-centred design methods. We describe the research set-up, present its outcomes and discuss the main findings.

3.1. The Empathic Handover approach

The Empathic Handover approach (see Smeenk, Sturm, and Eggen (2017) for more details) is distinct from other co-design approaches since it brings a solution for an empathic transfer of user insights to design teams who did not meet the users in person. In this approach, a principal designer (PD) is appointed as the consistent point of contact for both users and the design team. This PD facilitates three sequential handover activities: individual harvest meetings, collective handover workshops, and empathic ideation.

In the harvest meetings, the PD uses co-design methods to collect and understand users’ first-hand experiences. In the collective handover workshops, the PD enables participants to gradually build empathy with users by letting them experience and emulate the harvested stories and insights. The handover activity consists of two workshops: a discussion and a role play. The empathic discussion addresses questions that are based on the qualitative research outcomes from the harvest meetings. The questions capture the mundane and trigger participants to relive a vivid emotional autobiographical memory. This helps them connect to users and understand what they value and why. In the discussion, participants first answer the questions individually, since developing empathy is an individual process. For each question, they write down a sentence or two about each memory before moving on to the next. All the responses are then shared in a plenary discussion. The PD concludes the workshop by comparing and coupling participants’ experiences to the user insights. New
insights are documented. The role play enhances empathy through a re-enactment of the most crucial daily life scenarios obtained in the harvest. Participants are given an individual role instruction that supports them in improvising a scenario with other participants. After the role play, the experiences are plenary discussed and new insights are documented. Finally, in the empathic ideation workshop, participants are asked to generate ideas individually, which supports them in translating empathy into design: releasing personal thoughts and intuition. Then, they present their ideas to each other. This encourages more design iterations, leading to one or more team concepts. Figure 3 summarises the three phases of the Empathic Handover approach.

3.2. Research set-up

The goals of our comparative study were to assess: (a) the validity of the Empathic Handover approach for different design problems than a simulator and contexts than dementia; and (b) the transferability to other design teams than the previous single case study team. To this end, we explored how this and other traditional user-centred approaches influence the quality and fit of design outcomes, and students’ empathy with users. Even though Handover teams do not have direct contact with the users they design for, we expected that Handover teams would develop a similar amount of empathy as teams in which all the members were in contact with users, and develop more empathy than teams in which designs were based on a written paper.

3.2.1. Participants and conditions

The comparative case study was carried out in the context of an educational elective at the department of Industrial Design at the Endhoven university of Technology. Forty-eight university Master students (56% female, 44% male) took part. They received course credits for their participation. We divided 16 teams over three conditions. For educational reasons all student teams conducted literature, multimedia and user research. Yet, the further process was based on three conditions, see Figure 4. In the first condition (Handover), six teams applied the Empathic Handover approach: the user research conducted by others (and the PD) was experienced in an Empathic Handover workshop (facilitated by the PD). In the second condition (User), six teams used their own user research insights. In the third
condition (Paper), four teams used user research conducted by others disclosed by an (interim) design research paper.

### 3.2.2. Procedure

All students had to complete an educational design project with a total duration of 9 weeks in teams of three students. The design project comprised three phases: the research phase (5 weeks), the ideation phase (2 weeks) and the evaluation phase (2 weeks).

At the start of the research phase, each team received a design assignment (either mourning or dementia), after which all teams conducted literature, multimedia, and user research related to their assignment. All teams reported about the results in an interim design research paper. To simulate a situation in which the designers did not have personal contact with the user group they are designing for, the Handover and Paper teams changed assignments (and thus user groups) after the first phase: ‘mourning’ teams got ‘dementia’ and vice versa. For the Handover condition, one team member stayed committed to the initial user group as PD and two team members changed teams and user groups. The Paper team constellations remained the same. The User (control group) teams did not change assignment; they continued the process with the original assignment and user group in the same team constellation (Figure 4).

In the ideation phase, all teams generated ideas for their (new) user group. The Handover teams based their ideas on the Empathic Handover activities facilitated by their PD, the Paper teams used the interim paper of others, and the User teams used their own user

![Figure 4. The three conditions: Paper, Handover and User. Note: M means mourning, D means Dementia.](image-url)
research. The choice for an ideation method was left to the student teams and PD, and was not prescribed by the researchers.

In the evaluation phase, all teams evaluated the generated design ideas with users by applying the Co-Constructing Stories method (Ozcelik Buskermolen, Terken, and Eggen 2015). This approach uses storytelling to enable designers to evaluate their concept with users in a relatively early stage of the design process. The Handover and User teams evaluated their own ideas. The Paper teams changed back to their original users and evaluated the ideas generated by the other team.

Finally, all the teams wrote a final paper and gave a poster presentation. Then, two independent tutors assessed the quality of the teams’ design process and outcomes with the help of a rubric. Moreover, after this presentation, three semi-structured reflection sessions were held with all teams within each condition, enabling the researchers to evaluate the empathic capacity of the teams and conditions. We explain this in more detail in the analysis paragraph.

All participants were introduced to our study: we explained the goal of their participation and how we would use, compare and share the research outcomes. They each gave informed consent for audio recording of the plenary reflection session and using its anonymised transcriptions. For the Handover teams, we organised an additional training session morning in which the Empathic Handover approach and the role of the PD were introduced. Moreover, they experienced an exemplary empathic discussion and were involved in acting out two role play exercises about dementia. Subsequently, these Handover teams prepared their handover workshops collectively and selected a PD to introduce the new team members in their user group. We divided the remaining Handover team members and prevented bias by ensuring that initial team members would not meet again in new team constellations. During the handover session (of a day), we observed the Handover PDs and their new teams. After each handover activity (discussion, role play and ideation), we consulted each team individually, reflected on the activity and inquired about improvements.

3.2.3. Analysis
To evaluate the empathic capacity of the teams and conditions, we analysed the answers students gave to our semi-structured questionnaire in the three plenary reflection sessions (of similar duration) that were held with the teams within each condition. We asked open questions about the effect of the subsequent design activities on empathy: multimedia research, user research, (User, Paper or Handover) insights, ideation and evaluation. To evaluate these reflections objectively, two researchers first scanned the verbatim transcriptions independently to find quotes providing evidence related to the five factors. The results of this analysis were discussed until agreement was reached. Moreover, we took along our observations, the individual definitions on empathy in design written down by all team members and the intermediate reflections during the handover workshops. We discuss the factor identification in the following paragraph.

3.3. Results: empathic factor identification
The theoretical framework and the resulting Figure 2 enabled us to cluster the number and content of quotes, which provide direct evidence for one of the five empathy factors, within each User, Paper and Handover condition group. In Figure 5a, we show the resulting absolute
representation. The figure demonstrates that teams in the Handover condition expressed the highest number of quotes. Moreover, the Handover condition shows a clear emphasis on affective experiences and other-orientation. In Figure 5b, we demonstrate the factors relatively, which makes it easier to compare the three conditions. For example, we see that quotes reflecting self-awareness were found the least in all conditions. The Appendix 1 shows the factor identification per team. We discuss our qualitative insights below, describing each factor separately.

3.3.1. Emotional interest (EI)
‘Emotional interest’ (i.e. cognitively attending and attuning to users’ emotions), was very prominent in the Handover and User conditions, see the yellow dots in Figure 5. It was demonstrated by almost all the teams (except for one team in the Paper condition). Students stated that literature containing quotes and multimedia research such as documentaries set a knowledge basis that enabled them to see the relevance, become enthusiastic and get inspired about their initial user context: ‘The research articles we read made me more aware and curious’. They mentioned that hearing users’ personal experiences made them even more motivated and emotionally interested. These stories came from close relatives, strangers and experts. Some students learned new things from their near circle: ‘I thought I knew my grandfather’s process, but now I realise I only knew some of his feelings. It motivated me.’ Others found motivation in the engagement with users they did not know.
beforehand: ‘It confirms that we are designing relevant and helpful things’; ‘If I can make
them smile, it motivates me a lot and makes my day’; ‘When visiting the care institution,
we were in the middle of it, which motivated me a lot’ and ‘The user encounters made
dementia more accessible’.

According to User and Paper condition students, emotional interest especially grew in
the contact with users and experts. Yet, a new Handover team member expressed: ‘The
handover way of connecting to the new design context motivated and engaged me’. During
the empathic discussions, we indeed observed many animated conversations. Handover
students said they were interested in and touched by each other’s stories and by the PD’s
translation of these stories to the users’ experiences. This factor played an important role
in exploring the design context and understanding the users within.

3.3.2. Sensitivity (SE)
‘Sensitivity’ (i.e. affectively attuning to and being in contact with others), was most promi-
nent in the Handover condition. It was neither the most nor the least mentioned factor, see
the blue dots in Figure 5. When reading literature and gaining more depth in the design
context, many students felt insecure about approaching the vulnerable user group: ‘It felt
scary’; ‘I felt bad approaching vulnerable people and bringing emotions out’. Moreover, they
were reluctant to contact users: ‘We could not promise to deliver a meaningful and real
design solution’. Therefore, some teams asked professional experts for help with information
and user contacts. Literature supported teams in preparing for contact with experts: ‘You
do not want to go empty handed to the caregivers’.

In the user research, we especially found sensitivity in students’ quest to learn how to
address and behave around others. Students said the literature taught them: ‘How you should
address mourning people and how you should act’; ‘How to handle the emotional flux of
interviewees’ and ‘It takes away your ignorance’. Ultimately, by encountering the users,
students became relieved about the sensitive subject they were designing for: ‘It was less
hard than I thought from the literature’. The contact brought up feelings like: ‘Optimism:
it was not as hard as expected, and sometimes even fun’.

In our reflection meeting with the Handover teams, we found that it was equally impor-
tant that the PD was sensitive towards the Handover participants. Ethical aspects like trust,
mutual respect, tolerance and patience were mentioned. Students said the PD had to ‘set
the tone’ and make sure participants ‘felt at ease’ and ‘found a common goal’. Moreover, in
the discussion, Handover participants demonstrated sensitivity in how to respond to each
other: ‘I was aware of what to ask and not ask’. In ideation, Handover students said it was
important to ‘design something advantageous, appropriate and meaningful for the diverse
users’. Sensitivity towards humans, designs, methods and collaboration played an important
role in the user research, the handover and the user evaluation.

3.3.3. Self-awareness (SA)
‘Self-awareness’ (i.e. distinguish between the representations of own actions, perceptions,
sensations and emotions, and those of users) was the least demonstrated factor and observed
least in the Handover condition, see the red dots in Figure 5. We must note that the Paper
quotes identified mainly concern complaints of students being unable to utilize their per-
sonal experience. Students argued that literature was important, teaching them to be atten-
tive to themselves and others: ‘Good to read, because I had a lot of assumptions. Although
I thought I had the full picture, I had not even a tiny clue. User research was conducted from an open and professional stance: ‘When you interview users, you have to put your own experience aside’.

The Paper teams seemed aware of ‘self’ when interpreting the paper and translating this input into ideas. However, one team stated: ‘The paper was not convincing, had too obvious data: we doubted it’. These teams -not in contact with users designing for- mentioned difficulty in ideation: ‘Making a personal attachment to the design context was hard’. In contrast, an User team student defined empathy in design as: ‘Truly understanding the user’s needs in a way that you can identify with the target group so much that you can almost design for your own needs’.

In the Handover reflections, we observed that students preparing the handover workshop were attentive to themselves and the users when interpreting the user research: ‘It was interesting to transfer our five-week user research findings as accurately and purely as possible without too much interpretation’.

Although we did not identify many quotes in the reflection session with students, we did observe self-awareness during the Empathic Handover workshops. For example, in the Handover discussion workshop, students had consent and recognised one another (e.g. ‘absolutely; that sounds familiar’). Especially when a student was unfamiliar with the context of a question, they found it interesting to hook on to others’ stories. This led to sharp questions, deeper discussions and new insights: ‘Quizzing gave insights into others’ perspectives and coping’; ‘The diversity in student’ characters and coping was found in our answers to questions and comparing these helped to benchmark’. Self-awareness plays an important role in exploring what you share with others, but also in actively understanding what you do not share.

### 3.3.4. Personal experience (PE)

‘Personal experience’ (i.e. connecting to and reflecting on one’s own relevant experiences), was prominent in all conditions, see the purple dots in Figure 5. Some students thought it would be easier to connect to their own relatives than to strangers in the research phase: ‘If it is known you are more motivated’; ‘In my experience, we found things we could use’. However, this was not always the case: ‘It seemed easier to start with my parents, but it was actually not, since it involved me’. In addition, we found that students purposely used this factor in their communication with users and experts. Mentioning their own experiences helped build trust: ‘Users tend to trust me when they feel like I am having the same feeling’ and ‘If you bring in your own experience, it is easier to talk to users or caregivers’. Relating to their own experience also helped students interpreting what users and experts said: ‘We got many abstract examples from caregivers and then my own experience helped me understand and put what they said into perspective’ and ‘It is easier to relate and read between the lines’.

The Paper teams became demotivated because they could not generate ideas for the users they originally met with: ‘Switching to a new user group meant that we could not use our personal experience’; ‘It is very hard not to use your own experiences in the design’; ‘Normally, personal experiences make it strong’.

Since the handover workshop challenged students to comprehend users by immersing themselves in and experiencing similar situations, these students’ own experiences and feelings were explicitly used. This resulted in emotional statements like: ‘It made me feel really
awkward’; ‘I was so happy’; ‘I turned bright red’ and ‘I was as limp as a rag doll’. Students mentioned that it was easier ‘to draw on own experiences to relate to others than to imagine what people with dementia need’. However, openly sharing emotional details with the new team members also lead to personal distress: ‘I felt uncomfortable, because not everybody needs to know everything’. Despite this, most students appreciated the autobiographical exchange: ‘Many interesting things were brought up’; ‘You go really quickly from a distant abstract feeling towards OK, this is how it actually feels’; and ‘If I were in that situation, what would I like?’ Most of them even liked to take along elements of own personal experience. All the PDs mentioned that the design space was enlarged and enriched by the personal stories in the discussion. New team members’ interpretations of the user research findings led to interesting new design opportunities: ‘Extensive, more positive and meaningful opportunities for design not thought of by the initial team’.

The role play was considered to be a good way of personally experiencing the diverse perspectives of users. Participants found it alienating and were surprised about what happened to them: ‘The way you are encountered affects your state’; ‘The body language: you cannot imagine’; ‘There is a difference between hearing a story and getting the associated feelings of the stories by experiencing it’; and ‘You can really get angry or feel sad’. One student said: ‘the role play instruction itself already evoked some quivers and vibrations before acting it out’. This factor played an important role in really immersing and connecting to the users and finding new design opportunities.

3.3.5. Mixed perspectives (MP)

Handover teams demonstrated more evidence for taking different perspectives and combining affect and cognition than teams in the other conditions, see the green dots in Figure 5. In the research phase, students mentioned that mixing perspectives supported their understanding of one another: ‘Personal feelings and thoughts around mourning were difficult for me to explain, but when I connected them to literature it became easier for me to explain what mourning is’. In user research analysis, all teams mentioned comparing the user insights with literature and vice versa. This enabled them to relate findings and draw conclusions to ideate from: ‘You can’t run fully on emotions.’

In the handover discussion workshop, students investigated many diverse perspectives: ‘You normally only know how you respond yourself. You now are mirroring your own experiences with the experiences of others and the users’; ‘We are seeing more perspectives, not thinking in black and white.’ and ‘Being able to switch between a close perspective and a bird’s view perspective’. Students even mentioned that: ‘The handover activities prepared us properly for understanding and recognising the insights in the interim paper’. In ideation, one team said that coupling the autobiographical insights of the handover discussion to the user insights evoked ideas: ‘We could directly drill down to a concept’. Mixed perspectives appeared to be used most in converging and synthesising activities such as user research analysis, concept development and evaluation.

4. Discussion

Aforementioned qualitative results correspond to our expectation that the Handover and User conditions would lead to more empathy than the Paper condition. Moreover, we consider the tutor and user feedback on the design outcomes of the teams to indicate indirect
evidence for empathic development. Both these judgements showed how well a concept fit the experiential world of the users.

In comparing these, we found that two Handover ‘mourning’ teams and two User ‘dementia’ teams had the best results of all teams in both the user evaluations and tutor assessments. Surprisingly, the Handover mourning teams delivered designs that were more appreciated, according to tutors and users. We expected the opposite result, because of the dementia examples in our handover training and because five students had designed for dementia in earlier projects, whereas design for mourning was unfamiliar to all. The fact that some students personally experienced the emotions of mourning in their lives, which is impossible with dementia from a first-person perspective, could explain the difference in results. However, a few students did experience dementia personally as a caregiver.

Only one team – a User team – delivered a concept of insufficient quality according to the tutors. The other designs were of sufficient quality, but got mixed responses from users. The Paper teams’ concepts were not recognised or appreciated by users: ‘the concept did not fit, it did not connect’.

To sum up, the quality and fit of the design outcomes in the Handover condition was similar to the design outcomes in the User condition, and better than the design outcomes in the Paper condition according to users and tutors. The Empathic Handover approach seems an effective way to transfer user insights empathically to design team members that cannot encounter the users they are designing for.

4.1. Research strengths

Our heuristic of five individual factors that foster empathy in design was useful in comparing the empathic capacity of teams and conditions. In connecting the quotes to the factors located on the two intersecting dimensions -self vs. other orientation and affective experiences vs. cognitive processes- we developed a more elaborate notion on how empathic capacity can be built (Hess and Fila 2016b) and what the working mechanisms of each of the empathy factors based on Baldner and McGinley (2014) can entail in design.

Connecting personal experiences to user insights allowed Handover students constructing sensitive models to emotionally understand the users’ inner worlds and their diversity in perspectives, as has already been argued by e.g. Bluck et al. 2013; Smeenk, Tomico, and van Turnhout 2016; Smeenk, Sturm, and Eggen 2017; Tani, Peterson, and Smorti 2014; van Rijn et al. 2011. It seemed hard to describe user insights in and convey user insights from a research paper, as we saw with the Paper teams. Most of these students made false assumptions in the ideation phase, resulting in concepts that users neither recognised nor appreciated, which is in line with the research outcomes of van Rijn et al. (2011). Except for one team, these students seemed to be less emotionally interested in and less sensitive to their users in the plenary reflection meeting.

At first sight, it seemed remarkable that the self-awareness factor was low in all conditions and especially in the Handover condition, since the Handover approach – unlike Paper and User conditions– explicitly involves personal experiences related to users’ experiences. Yet, in the Handover condition, the high number of quotes related to the mixed perspectives
factor as well as the way Handover teams connected to users might explain the low score in self-awareness. Self-awareness is a more implicit, imaginative, personal and cognitive process in which you interpret and hypothesise. Mixed perspectives and the Handover approach, on the other hand, are also affective and likewise about understanding own and others’ real experiences.

To conclude, building and measuring empathic capacity included reflection on self-other dichotomy and navigating through affective experiences and cognitive processes, which is in line with Hess and Fila (2016b) Smeenk, Tomico, and van Turnhout (2016). This requires a holistic view on all five individual factors that foster empathy in design, as has already been argued by Baldner and McGinley (2014).

4.2. Practical improvements and recommendations

We found that the Empathic Handover approach was not always understood properly. From the reflection meetings, we found not all the students grasped that the two handover activities (discussion and role play) purposely have different goals. The discussion is a divergent activity aimed at expanding user insights by connecting them to the designers’ own experiences. In contrast, role play is a convergent activity focused on connecting to the most crucial and relevant user scenarios to design for, giving focus to ideation. The first relates to personal experience and the latter to mixed perspectives. Moreover, the discussion activity raised ethical questions from some students: to what extent one needs personal exposure for empathy to arise? This question begs more research. At least, it is important for handover participants to be prepared for the personal approach. Participants should know that they do not need to answer all the questions and can consciously decide what to share or not and in what detail. This relates to sensitivity.

In role play, some students regretted that only two or three specific scenarios were relived and that some situations could not be acted out. The choice and definition of an authentic role play scenario, the amount and content of the role play instructions and the division of roles are crucial for empathy to develop. This is not easy to develop and probably requires more design maturity and expertise than we could expect from students. Moreover, it would be interesting to investigate alternatives or supplementary design tools to role play.

During the handover activities, we observed that PDs were searching for their role. Some PDs joined the handover discussions by bringing in personal stories, none of them joined the role play and all of them joined ideation as participants. Moreover, the Empathic Handover approach purposely does not prescribe a specific ideation method for the PD to use. It does so to give the PD freedom in tool selection (for the context at stake). However, the handover approach does recommend stimulating participants to start with individual ideation, giving space to release empathy by intuition. Yet, not all PDs facilitated this individual action. In addition, they did not take sole responsibility for documenting findings. Four PDs mentioned that it was hard to facilitate the workshops and make notes. To conclude, our Master students and especially the ones who took the role of PD lacked experience with the handover method and seniority in co-design.

Another issue raised by Paper teams, who evaluated the ideas of another team, was that it was easier to evaluate a concept that they were not emotionally connected with, since this delivered an objective view of others’ concepts and evoked more design suggestions than conducting your own concept evaluation.
The issues raised here lead to several suggestions for improving and further developing the Empathic Handover approach. First, we suggest developing a practical and accessible Empathic Handover instruction canvas to clarify the approach and the role of the PD (in all its facets), and to support designers (and researchers) in applying it. Second, we suggest searching for more Empathic Handover methods and developing a toolbox. These (extra) activities should prevent the loss of ideas in the discussion activity and the loss of important user insights that cannot be relived through role play, and/or support co-defining a clear design challenge before ideation. Third, we propose a fourth activity to the current Empathic Handover approach. The PD conducts this co-reflective evaluation, where users give tips and tops concerning first ideas (e.g. the Co-Constructing Stories approach introduced in procedure paragraph 3.2.2). See Figure 6 for the expanded Empathic Handover approach.

4.3. Research limitations

Our comparative study had several limitations related to the analysis and execution. Our new way of ‘measuring’ empathy in design with the five individual empathy factors mainly depends on soft data (quotes) and an exploratory small-scale study. Therefore, it is difficult to demonstrate the extent to which our qualitative analysis method – counting quotes and clustering them to empathic factors for each team and condition – was a credible way of measuring empathy. Our results demonstrate trends, but are an indication only; we could not demonstrate significance with any non-parametric test due to the small-scale sample. However, we did try to be as reliable as possible. We used a similar semi-structured format per condition to trigger empathic factor quotes in the reflection meetings and two researchers discussed their individual cluster findings until consensus was reached. Although considered important to empathy, the factor self-awareness in understanding others was relatively low in all conditions. Clustering quotes to this factor was considered difficult by our researchers. Even so in psychology, the current empathy measurement scales lack self-other distinction assessment items. It seems more difficult to capture this – probably more implicit and- reflective factor.

Another disadvantage was our educational context: we conducted the research within the scope of an elective course. We used a convenience sample of enrolled university Masters students, which is not a representative sample of the professional context we are aiming
for. The quality of the teams’ work may have been influenced by the students’ (and users’) backgrounds and social abilities. However, we thought it was important to compare the empathic development of teams under several conditions, a research setting impossible to achieve in practice. Moreover, for educational reasons, all students were expected to conduct user research. They all encountered vulnerable users, but the Handover and Paper teams did not encounter the users they would ultimately design for. This first contact with users in the context of this course could have positively influenced the empathic growth of all students. A potential risk is that the initial user encounters may have triggered general empathy and thus influenced our research. However, since most Paper concepts did not match the users’ needs, this effect seems small.

In hindsight, it might have been better to compare the Handover and Paper conditions by giving the Paper students the interim papers written by the Handover teams. We decided not to do so because the initial work of the Paper designers then would not have been proceeded with and students (and users) might have felt disappointed (ethics).

Finally, the course did not give students enough time to iterate much on their first ideas, and for the Paper and Handover teams to incubate the new user group information.

5. Conclusion

Although empathy is a complex multifaceted construct, we argued that empathy in design can be operationalized by five factors: emotional interest, sensitivity, self-awareness, personal experience and mixed perspectives (Baldner and McGinley 2014). Based on the overview of Hess and Fila (2016b), we proposed a theoretical framework that uses these five individual factors to foster empathic capacity in design. This heuristic proved useful in systematically comparing the empathic capacity of teams and conditions. Subsequently, we could validate the transferability of the novel Empathic Handover approach (Smeenk, Sturm, and Eggen 2017). Our study indicates that the Empathic Handover approach is transferable to other design teams and to other problems and contexts. Compared with a traditional user-centred design approach, in which a design research paper informs teams for ideation, the Handover approach seemed to lead to more indirect and direct empathy. Compared with a traditional user-centred approach, in which design teams have direct contact with users, the Handover approach can lead to equal indirect empathy and direct empathy. However, the factor identification differed between these two conditions. The Handover condition showed more mixed perspectives and sensitivity, the User condition more emotional interest.

Moreover, the theoretical framework and the content of quotes delivered an elaborate notion of the working mechanisms of empathy in design. One puzzling finding was that the Empathic Handover approach delivered better results when the young participants personally experienced situations (mourning) than in non-experienced situations (dementia). This confirms to the idea that using similar autobiographical experiences and feelings allows designers constructing sensitive models to understand the users’ inner worlds (e.g. van Rijn et al. 2011; Bluck et al. 2013; Tani, Peterson, and Smorti 2014; Smeenk, Tomico, and van Turnhout 2016; Smeenk, Sturm, and Eggen 2017).

Based on the insights from our study, we invite others to use and reflect on our framework and improve, expand and further develop the Empathic Handover approach, both for professional as educational settings. Our novel framework might support tutors in educational
settings to explain the factors that foster empathy in design and might support them in comparing empathic process. Our practical recommendations involve (1) developing an Empathic Handover instruction canvas, (2) investigating an Empathic Handover toolbox, and (3) expanding the approach with an Empathic Handover co-reflective evaluation with users conducted by the PD. To conclude, we hope the article paves the way for the use of a new approach to foster empathy in design.

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References


Appendix 1.

**PAPER teams**

- mourning 1
- mourning 2
- Kolom 2
- mean
- Kolom 3
- dementia 1
- dementia 2

**HANDOVER teams**

- mourning 1
- mourning 2
- mourning 3
- mean
- dementia 1
- dementia 2
- dementia 3

**USER teams**

- mourning 1
- mourning 2
- mourning 3
- mean
- dementia 1
- dementia 2
- dementia 3

**CONDITIONS**

- Paper
- Handover
- User