

# Making Wellbeing: A Process of User-Centered Design

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## ABSTRACT

We consider the role of making in current HCI design practices and how it may affect the wellbeing of those who participate in these processes. Through an exploration of psychological concepts of wellbeing and their connection to making experiences, we suggest that making can facilitate and support both hedonic and eudemonic facets of wellbeing. We illustrate this in the context of three case studies that engaged people in creative making activities as part of user-centered design processes. Based on our experiences, we argue that researchers ought to be mindful of the potential impact our design processes have on our participants and provide considerations for those designing for and with participants where wellbeing is a concern.

## Author Keywords

User-centered design; HCI; making; wellbeing.

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H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous;

## INTRODUCTION

The nature of participation in interaction design is currently subject to an increasingly critical discourse. This discourse questions how we construe participation [40], what users gain from participating [2], and how participating in design impacts those who take part [13]. A consequence of this has been a focus on making participation a two-way process that benefits both participants and designers [2]. To consider how our processes may impact participant wellbeing at the moment of participation is particularly important due to an increasing body of HCI research that engages with very vulnerable populations and emotionally sensitive contexts such as bereavement [23], domestic violence [4] or challenging mental health [39]. Yet, there

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are compelling reasons for why interaction design generally should care for the wellbeing of our participants. Currently, wellbeing features prominently on national and international agendas with increasing attention being given to how to support and enhance it across society [25,38]. Through careful configuration of our design processes, we can not only positively impact the wellbeing of the individual, but also contribute to society as a whole. This, in turn, may benefit the HCI and design community as we increasingly engage in long-term community-based projects (e.g. [15]). These often require continued participation from those who take part, at times even over a period of years [4]. Providing experiences that positively enhance the wellbeing of our participants during the design process can offer a potential method of securing such sustained engagements.

Making is a central practice within the participatory and user-centered design of technology, which may provide positive experiences. Here, making refers to hobby-based creative activities, rather than expert handcraft [1] or do-it-yourself (DIY; [30]) repair, reuse, or customization of existing artifacts [30]. Examples of making also include the creation of digital portraits in the process of recovery from experiences of domestic violence [4], the completion of design probes to foreground experiences of personhood when living with Dementia [42], and the creation of textiles incorporating wearable computing to motivate and mentor at-risk children [18]. This work draws on creative arts practices and involves participants engaging in creative tasks, either to make new art objects or modify existing ones, with the aim of informing and better understanding technology design. It has been suggested that this creative practice can positively impact the wellbeing of the participants. For example, [18] infer that creative workshops led to feelings of creativity, ownership and self-esteem, improved mood, and social connection among participants.

In art therapy, there is some evidence that making is an important therapeutic approach, which can lead to an increase in wellbeing [32]. This suggests that such endeavors are inherently stimulating, enjoyable, and relaxing [28]. Additionally, they also provide an individual with control over the artifact they are creating, increase their sense of competence as they create the artifact as well as a sense of social connection as it is made and,

subsequently, shared with others [6,11]. These facets contribute to increased wellbeing by providing both immediate, pleasant experiences related to the making experience while simultaneously nurturing a sense of meaning and purpose through a process of personal growth that is important to longer-term wellbeing [34].

This paper presents an argument that explores how activities of ‘making’ intrinsic to traditional user-centered design practices might impact wellbeing. This paper is not an exhaustive study of this possible effect. Rather, it seeks to examine and promote discussion within the field regarding the relationship between our making practices in design and the possible benefits these may have on the wellbeing of our participants. We discuss psychological concepts of wellbeing and their connection to making. We also explore how making practices within user-centered design processes may contribute to the wellbeing of our participants using the examples of three distinct case studies. The first case study explores how engagements in digital and analogue making activities can enhance the wellbeing of hospitalized children; the second study extends on the qualities and challenges of performing creative activities with women in secure forensic hospital services to both promote their wellbeing and allow for the co-creation of digital technology; and the third study describes how the completion of probes in the context of Dementia care is of significance both to the wellbeing of the participants and for informing the design of new technology.

The contribution of this paper is threefold. It begins with a conceptual definition of wellbeing, which is an increasingly prevalent research area within the HCI and design community. It then provides an initial exploration of how wellbeing might be impacted through creative activities within user-centered and participatory design processes. Finally, it seeks to encourage other members of this community to carefully consider how design activities can be used to support the wellbeing of participants during participation, rather than just through the designed outcome.

### **CONCEPTUALIZING WELLBEING**

In the field of Psychology, there are two prominent theoretical understandings of human wellbeing that take two distinct, yet intertwined approaches: the hedonic approach [16] and the eudemonic approach [34]. The hedonic approach often explains human wellbeing as the presence of positive affect and the absence of negative affect [9]. In other words, pursuing experiences that bring pleasure are likely to bring more happiness [8]. Such pleasures may be related to both the body (e.g. physical achievement, sex, food) and the mind (e.g. attainment of important goals) [17]. The hedonic perspective argues that a person’s level of wellbeing results from a comparison of pleasant to unpleasant experiences; a higher number of pleasant experiences is assumed to lead to wellbeing [8].

Consequently, more unpleasant experiences than pleasant ones will result in reduced wellbeing, suggesting that a person should strive for experiences of pleasure throughout their day to ensure wellbeing. However, research suggests that such hedonic experiences are transitory [24], meaning that hedonic experiences will increase the wellbeing of a person only temporarily before the individual returns to their normal wellbeing level [8].

The eudemonic approach suggests that wellbeing is achieved through living a life of meaning and purpose, instead of pursuing transitory pleasurable experiences [47]. Following this conceptualization, a person is likely to experience wellbeing when they engage in value-congruent activities during their day-to-day life [44]. In other words, if a person’s daily actions are in service to their longer-term values and goals, aiming for self-actualization, they are likely to experience positive wellbeing [33]. Self-determination theory (SDT) may explain how we can achieve the eudemonic facets of wellbeing. Specifically, it argues that satisfaction of autonomy, competence, and relatedness is crucial to human wellbeing. If a person has control over their lives, is able to achieve their aims, and possesses meaningful personal relationships to other people, they are likely to experience vitality, psychological growth, and wellbeing [33]. This theoretical approach has received much validation from empirical studies which illustrate that satisfaction of autonomy, competence, and relatedness lead to increased wellbeing [35]. Thus, the eudemonic perspective considers wellbeing as occurring when an individual is optimally functioning.

Psychological research suggests that the hedonic and eudemonic conceptions of wellbeing, while distinct, conceptualize overlapping features of human wellbeing [5]. Empirical research supports the hedonic and eudemonic conceptions, both individually and in interaction. Studies have found wellbeing to be the result of the hedonic conceptualization of maximizing pleasure [19]. Some have implicated the need for meaning and purpose alone in life [37]. Others have found evidence for both subjective happiness and the presence of meaning in life acting together to provide wellbeing. This suggests that wellbeing ought to be considered as a multidimensional construct, incorporating both hedonic and eudemonic elements [8]. For an individual to be happy, they must have, both, more positive than negative experiences in their life and the presence of meaning and purpose. Ideally, when undertaking design practices with the aim of ultimately supporting wellbeing, we ought to consider how our processes can impact subjective happiness and enable people to experience their lives as meaningful and purposeful during the design process itself.

### **Supporting Wellbeing through Making**

Making is a well-established practice in many therapeutic settings, such as in the context of art therapy, for example with children who may have emotional, developmental, or

behavioral difficulties [43]. Such approaches focus on physical engagement and interaction with materials and the child's interaction with a therapist [43], as they make an art object, which may represent their feelings. Such creations provide a positive opportunity for reflection and non-verbal self-expression that help support introspection while also enabling others, in this case the therapist, to communicate with, or better understand, the individual.

The use of different art materials offers a variety of sensory and tactile experiences that support an active, physical and creative engagement, which may distract the individual from personal distress or destructive behaviors and allow for a stimulating, enjoyable and relaxing experience [6,20]. In addition, creating can be a pleasurable and enjoyable experience that may result in feelings of competence [11]. Furthermore, the created object can strengthen self-confidence and self-esteem, particularly upon being shown to others who might praise and value it. Yet, within art therapy, the relationship between the therapist and client is primary, with art considered the medium through which the client communicates about her- or himself [32].

Making can also be of benefit to wellbeing beyond traditional therapeutic settings as it can provide the conditions necessary for both hedonic and eudemonic experiences of wellbeing. While making can be frustrating at times, particularly if it is not going well or it is taking time to gain the required skills, it can provide both the pleasant experiences and sense of autonomy, competence, and relatedness that are so crucial to wellbeing. In this sense, making and creating new artifacts can be an enjoyable experience, one that provides feelings of wonder, agency, and satisfaction [11]. For example, making objects, drawings, or paintings have been found to lead to the experience of increased confidence and joy [28]. Thus, making can provide the experiences of pleasure that is vital to the hedonic perspective of wellbeing.

Other studies have shown that time spent knitting results in an increased sense of calm and happiness, while also providing a more sustained focus on creating a garment [29]. This suggests that making can also potentially support eudemonic conceptions of wellbeing, where a person is intrinsically motivated and likely to experience psychological growth and wellbeing [33], alongside the hedonic experiences entailed in 'doing'. In this sense, the individual has control over what they want to make and what form it will take. Similarly, positive feedback on the created artwork increases the person's sense of competence, achievement, and satisfaction [6]. Finally, making, while often being a solitary, reflective endeavor, has a social texture to it in many ways. As an individual makes and shares an object, they become increasingly engaged with their social and physical environment. All these positive facets of creative activities can provide the individual with a sense of achievement and satisfaction, and offer an

opportunity for creating meaning and purpose in life through the creative engagement [6,34].

### **Designing as Making and Telling**

Traditional HCI practices have long included users and stakeholders participating throughout a design process. This is motivated by an acceptance that users are experts in the use-context and that establishing a space for shared communication can elicit understandings of this context that will positively impact design [36]. As methodologies, participatory design and user-centered design approaches seek to understand and envision the use of an artifact before it is actually used [10]. Both processes, but particularly participatory design, achieve this through a combination of giving users a say, mutual learning, and co-realization [36].

Making acts as a vital component of many participatory and user-centered practices, enabling people to tell something of themselves and their lives through the things they make. It has been diversely applied within HCI, including in the redesign of a public library [7], co-design of transit services [48], the development of services to promote safety for young homeless people [47], and with people with chronic illness [22]. As a practice it is also used across the broad age span that HCI addresses in its design work, for example with children [7], adults [45], including both younger [47] and older adults [21]. The materials used in such making can be digital, such as the creation of digital photographs [45] or video blogs [22], and physical, including the creation of personal journey maps [48], or a combination of both, i.e. augmenting mobile phones with traditional making materials [47]. Such making processes provide a stage for shared dialogue between participants and designers [36]. By making artifacts, the design process can be a pleasant, positive experience [18], where participants are invited to communicate their goals, values and experiences to both each other as well as a designer, creating opportunities for shared understanding and relatedness. Further, by engaging in these processes participants directly contribute to the design work, altering the resulting design outcomes. It is this making that may be considered a conduit for empowerment; where the making activities participants engage in show potential to heighten feelings of autonomy, competence and relatedness.

That making practices occur throughout user-centered and participatory design processes suggests that these engagements with participants have the potential to facilitate both the hedonic and eudemonic facets of wellbeing. In the following we explore how making practices within user-centered design processes can impact the wellbeing of the participants. We illustrate how elements of these creative engagements relate to experiences and constructs considered to be of significance for wellbeing.

### **MAKING IN EXISTING HCI PRACTICES**

In what follows we introduce three case studies of user-centered practices. Common to each case study is the

involvement of participants in making as part of the design process. We focus in each on how interactions engendered by making activities might contribute to wellbeing. To this end, we use the constructs of self-determination theory [33] to identify eudemonic aspects of wellbeing within the experiences. We explore how the making experiences provided autonomy, competence, and relatedness for those who participated, alongside the hedonic conceptions of pleasure. The case studies illustrate differing levels of participation across the spectrum of current HCI practice [40]. The first case study presents a lower level of participation, where observations of making in a children's hospital inform our user-centered understanding of the hospital. The second case study is an example of a more engaged level of participation, involving the co-creation of artifacts by women in a medium secure forensic hospital. The third case study presents a case of the participants as co-designers and explores how making can inform the collaborative design of digital technologies to support personhood in dementia.

### Case Study 1: Making when Designing for Users

Our first case study describes different approaches to making that occurred in the context of a project exploring how digital technologies can be designed to facilitate children's play in a UK hospital. It included the deployment of Magic Land, a digital technology that facilitates story making and telling [26]. Over a period of 12 weeks (where we visited the hospital once per week), we were able to observe story making sessions between a female play specialist and some of the children using Magic Land, as well as other existing making activities.

Magic Land (Figure 1) comprises four play therapy applications that were designed to enable new opportunities for play through the making and telling of stories [26].

On a touchscreen display, four toys are offered to the child to engage with: *Flying Feathers* seeks to support both creative and emotional expression; *Rosebush* facilitates



Figure 1. Magic Land installed in the hospital playroom.

storytelling; *Hero* enables fantasy play; and *Water* provides new playful opportunities with digital water and fish. During the deployment, we observed six sessions in which these applications were used either by the play specialist with children or by children on their own. Typically, in these sessions the play specialist and one of the children would sit together in front of the touchscreen display, with the child creating and telling stories through interaction with the system. Throughout the deployment the play specialist was extremely uncomfortable using Magic Land, worrying she might make a mistake she could not correct. On the whole, she preferred to engage in making sessions using traditional analogue materials with which she felt much more comfortable and at ease.

One observed Magic Land session involved Sarah, a 9-year old girl who had to stay in the hospital for a few days. Her play with Magic Land lasted approximately 20 minutes, with Sarah and the play specialist sitting together at the touchscreen, while her mother and the researcher sat at the small table behind Sarah. Sarah creative engagement with Magic Land involved both creating and telling stories. She used the *Rosebush* and *Water* toys to create and perform some very imaginative stories. This started off by her selecting the *Rosebush* toy, carefully browsing the in-built images, and choosing an image of a chicken. She created a new story, telling the tale of the chicken boarding a plane and going on holiday to America and of him sitting on the wall at Sarah's friend's house, turning to her mother while pointing at the screen to illustrate where he would be sitting. At this point, Sarah's mother asked if the chicken had visited Emma's house, saying that Emma is Sarah's best friend and lives close to their home, before telling her that Emma will visit with her mother soon. Sarah agreed that it was Emma and said she missed sitting there with her. Sarah then chose the *Water* toy and added some fish to the water. She then paused briefly, wondering aloud what she should do next, before choosing to add some thunder and lightning. On hearing the sound of thunder, Sarah turned to the play specialist and began to talk about her brother, how he is scared of thunder, and always hides when he hears it. After being asked by the play specialist whether she missed her brother, she quickly answered yes, turned back to the screen, and closed *Water*.

### Satisfying the Need for Relatedness through Making

The most striking feature of this case study is Sarah's sense of relatedness during the creative activity. For example, Sarah turned to her mother and illustrated to her where the chicken was sitting while creating and telling her first story. Similarly, while playing with the *Water* toy, Sarah happily relayed a story about her brother to the play specialist. The making activity appears to have enabled Sarah to feel connected to both her mother and the play specialist, which are both meaningful personal relationships for her. Thus, the making activity appears to not only have been enjoyable but to have satisfied the basic psychological need for relatedness.

## Case Study 2: Making in Person-Focused Design

Our second case study describes a co-creative, person-focused making approach that is sensitive to the abilities of the research participants of the *Spheres of Wellbeing* project. Carefully scaffolded, it aims to provide interesting and stimulating making experiences while also contributing to the design of bespoke digital technology.

The Spheres of Wellbeing are a set of three artifacts that were specifically designed for a group of six women who have severe mental health problems and a learning disability, and live in medium secure forensic services of a UK hospital. Engagements with the Spheres aim to support the women in the learning and practice of vital therapeutic skills of their treatment of Dialectical Behavioral Therapy. The *Mindfulness Sphere* presents itself in the form of a crystal ball-shaped artifact that upon touch assesses and reflects a person's heart rate through colourful lights that fade-in and -out with every heartbeat. As such it can enable a new, experiential way of bringing awareness to one's body and, as a form of biofeedback, offers the opportunity for self-regulation. The *Calming Sphere* is a non-digital bead bracelet that the women can hold on to at times of emotional distress. The *Identity Sphere* resembles a purse that displays, in a screen inside, short personalised videos that gently invite the women to connect and be reminded of meaningful aspects of their self (for more detail see [39]).

The basic design concept and functionality of the Spheres were established in close collaboration with hospital staff. From this it became apparent that it is also very important to actively involve the women in the co-design of their Spheres. We therefore conducted five creative sessions with each woman over the course of five weeks in which they made their own beads from polymer clay for their Calming Sphere bracelet; created little charms to be placed as decorative elements around the core of their Mindfulness Sphere; and for the Identity Sphere, they designed the look of their purse (i.e. color, ornaments, pocket shapes) and shared with the researcher photos, music and personal interests that they wished to have included in their videos.

By way of example, the bead making activity started off with the researcher presenting the women with a range of 24 colored clay blocks from which they could choose three. However, at times overwhelmed by this choice of clay and upon displaying signs of difficulty in deciding which to take, the researcher then often broke this task down by asking the women for their favorite color first and from there encouraged additional choices. Once their chosen clay blocks were unwrapped, they were gently guided into taking a small amount of clay from each and they were taught how they can warm and knead the clay until it was soft enough to make little clay rolls and beads from it. At this stage, present staff members often started to also become actively involved and assisted the women in warming and preparing the clay.



**Figure 2. An example of the 'kaleidoscope' technique, which starts with a random selection and assembly of clay rolls that get divided and combined into beautiful symmetrical patterns.**

Once the women were familiar with the basics of forming clay rolls and made a selection of uni-colored beads, the researcher suggested and guided the women towards the creation of more elaborate designs. This involved the combination of different clay rolls to one bigger clay cone as well as tentative steps of dividing and re-combining the clay for the creation of beautiful patterns (Figure 2). While the women initially were a little hesitant in the process of choosing colors and in making their first beads, they became more involved in the activity once they saw their first creations. Noticeably surprised - as were staff - about how nicely their patterned beads turned out, they were motivated to continue, selecting more colors and additional patterns that they liked to create. Some of the women even started creating their own free form shapes, such as love-heart beads and beads in the shape of their initials.

Throughout this process, the researcher assisted the women in their making endeavor. At times, and depending on the abilities of the individual, this meant that the researcher had to validate, mostly verbally or by means of body language, even the smallest of steps that the women were taking (i.e. confirming that their chosen colors were lovely, encouraging individual acts in working the clay).

The women were very impressed with and proud of the beautiful beads that they created, which were different each time as they tried new colors or patterns. This became apparent more strongly through positive physical responses and verbal expressions of joy, but also through their enthusiastic descriptions of what they were doing in these sessions to staff thereafter.

### *Pleasure, Competence & Self-Pride through Making*

In this case study, the making activity strongly aligns with two facets of wellbeing. Specifically, the creation of the beads was an enjoyable experience. There was joy in the hands' on, tactile act of making the beads, seen through positive physical responses, expressions of joy and their descriptions of the activities to staff afterwards, facilitating the experience of hedonic facets of wellbeing among the women. Furthermore an increased sense of competence for the women is illustrated in their responses, and those of the

staff, to how nice the beads they created were, and in their decision to create their own free-form beads.

### Case Study 3: Making as Co-Design with People

This case study draws on an experience-centered design research project, the Personhood Project, that centered on a deep engagement between a design researcher and her participants: Gillian, a woman living with mild dementia at our point of collaboration, and John, her husband. The project sought to develop a richer understanding of the experience of personhood in dementia and the potential for design to enrich that experience [42].

Improved treatment and early diagnosis facilitates people with dementia to be their own vocal advocates in their treatment [14]. The Personhood project leveraged this potential for participation and agency by bringing Gillian and John right into the heart of a co-creative design enquiry based around bespoke design probes [41], and led to the development of a series of jewelry and digital jewelry artifacts. A set of ten probes were designed that foregrounded the couple's personal biographies as they told them and were attentive to personhood by relating to their sense of self, self-worth, key experiences, personal meanings and the projecting of the self into the future.

Two probes that resonated with the couple through the creative act of completing them (rather than just what they chose to say through them) were 'Self Tree' and 'Home'. 'Self Tree' consisted of a series of oval locket-like forms asking the couple to: *Please use these objects to tell me about some of the people who make you who you are.* The couple described closest relationships with family and friends, including a story of each relationship and a quote from each person (about Gillian). While the narratives created were intimate and beautiful, the creative act of making the probes complete through the telling of the stories enabled Gillian to recall (often in detail) things about each person. Such recollections astonished and delighted the couple and led to some significant reflections by Gillian on what it viscerally felt like to remember something: *"it's just like, you just open a little bit to start with (gestures prizing a door open with fingertips)... and then you go a bit further and you think 'Well, yes I'm going to have a try at that!...and then, it's it's where when suddenly, I've totally forgotten about something and it's, it's come back!" (...)* *Things that I, I'd totally forgotten about for years (...)* *and then all of a sudden, it was just it was like ehm, a lot of water all just co, co coming down all at once, you know saying 'It's alright you can say this, you can do this'.* Gillian's sense of achievement and pleasure in this fuelled the couple's engagement in the rest of the project and remains something that John still mentions to the researcher several years later.

The 'Home' probe (Figure 3) was a small wooden house (16×12×10cm) with a note asking the couple to use it however they saw fit to share what home meant to them personally. Gillian and John reflected on what home meant



Figure 3. Completed Home probes.

to them in relation to the harsh changes to their lives through Gillian's dementia by describing home before and after her diagnosis. However difficult these reflections were they responded in a playful, creative way by using a collage to give the house rooms for each family member; decorating it, in essence, and making it feel 'lived-in'.

It was apparent in seeing them talk through the finished probe how they had become absorbed in the collage format that they had adopted and had found something valid in the making process (enmeshing family photographs and speech bubbles with both the happy memories of home and the harsh and frightening changes in their lives). Although it was John's hands doing the cutting and writing it was Gillian's words that stitched it together and very much a joint creative act. John had found something particularly valid in this making process which he took further in the development of a collage book adding breadth to each of their probe responses and documenting the whole project as it developed over the following months.

The couple had begun to see the whole project as a form of legacy building, in which the probe responses and design outcomes were ways in which they and their relationships and memories could be told and held. It seemed as though John had found something personally important in adding his own layer to this process through the making of this book. The agency that this gave him to do something towards capturing their lives and representing it seemed to give him a lot of pleasure and satisfaction as though he had found a form of expression and also some form of control over at least one aspect of how their lives were changing.

A final aspect of the project that we want to reflect on was something that the researcher used with the couple to shift the dynamic of one of their sessions together. Meetings occurred in the couple's home and the researcher had a sense that the couple felt that there was a pressure on the researcher's time and that they should be as productive during their time together as possible. The researcher could sense that a little more reflective time and space could enable Gillian to articulate what she wanted to say more easily. For one meeting the researcher brought some wet porcelain clay with her and an afternoon was spent making beads and other small forms together. The difference to the dynamic in the room was significant. The atmosphere became much calmer and the pace became slower. There were long periods of silence where John set about making a series of pieces and the researcher and Gillian made beads

together by rolling balls of clay in their hands and pushing Gillian's fingerprints into them as decoration. While Gillian enjoyed the tactility of this activity, more significant was the comfortable silences that this created for her. This gave her the opportunity to communicate her feelings about how their lives were changing and about dementia, removing the feeling of time pressure that may have been prevented her from doing so previously.

#### *Satisfying the Need for Autonomy*

This final case study implies how the need for autonomy might be satisfied through creative making activities. For Gillian and John, autonomy came from their ability to build their own legacy of their life together, despite Gillian's dementia. Their responses to the probes became ways through which they could tell and hold their memories. This is also visible in John's creation of the collage book of their memories. The process of making enabled John and Gillian to keep their memories, which were being eroded by dementia. As such, these making activities gave the participants more control in the face of constraints that were either personal or contextual.

## **DISCUSSION**

We have explored how making within HCI practice can be leveraged to support the wellbeing of those who participate in research. In this section, we address how such making practices link to the wellbeing of the participants. While we have not employed outcome measures of wellbeing, we illustrate how facets of wellbeing are achievable through making. We then discuss the importance of this for HCI, before proposing a number of steps designers need to take to establish this as a primary concern in practice.

### **The Relationship between Making and Wellbeing**

Our case studies suggest that making activities can enhance the wellbeing of those who participate in our research. As discussed earlier, we define wellbeing as consisting of both hedonic and eudemonic elements [5]. For a practice to positively impact people's wellbeing then, it ought to provide pleasant experiences [19] and the autonomy, competence, and relatedness that are imperative to a sense of meaning and purpose [37]. While previous HCI research exploring making has identified the existence of such facets [12,27,30,31], they have not explicitly been linked to making practices intrinsic to user-centered design, nor has this work explored their possible influence on wellbeing.

The women in our second case study found joy in the act of making the beads. The use of making also created calm spaces for reflection and the potential benefits of this to wellbeing should not be underestimated [3]. Here we find making creating a peaceful space for questions to settle and be lived with for a while before an answer can be found. We witness this as Sarah pauses for a moment while using Magic Land after being asked by the play specialist about her brother, and also in Gillian's ability to reflect upon the impact of dementia on her life when kneading the clay.

Making also provided a space to meet the eudemonic aspects of wellbeing. In the first two case studies, the making activities were undertaken in what are, normally, highly constrained environments where residents have little autonomy. Yet, in the act of making, the participants were given more autonomy than they typically achieve. Despite choices being limited in both cases, this still provided a level of autonomy beyond what they were normally able to achieve during their hospitalization. Thus, participants had increased autonomy in the face of constraints that were either personal or contextual.

We also find evidence that the making activities might influence feelings of competence in the participants. For the play specialist in the children's hospital, technology challenged her sense of competence, resulting in her favoring traditional methods of making with the children. Yet Sarah had no such problems, comfortably navigating Magic Land and using it to tell her stories to her audience. We see an increased sense of competence for the women in the second case study also. This is illustrated in their responses, and those of the staff, to how nice the beads they created were, and in their decision to create their own free-form beads. Yet, competence does not solely reside in technical or creative success. For Gillian, her sense of competence was reinforced by her ability to recall, prompted by her creative engagements in response to the designed probes, stories about close friends and family, which had seemed beyond her capabilities.

Finally, participation in making activities during the design process could be seen to provide our participants with a sense of relatedness. This was found for instance in the first study, where Sarah sought to connect with her mother and the play specialist through her story making activity. With Gillian and John, relatedness can be seen in the completion of the 'Home' probe by using it to give each family member a room to decorate, reinforcing their sense of connection as a family.

### **Towards 'Making Wellbeing' in Interaction Design**

One of the initial tenets of the Scandinavian tradition of participatory design was acknowledging that participants gain from their participation in design activities [2]. In the context of the 1970s workplace, the gains were primarily knowledge—the technical know-how of how new systems and processes would impact on long established work practices. It has been argued that the popularization of participatory approaches across design and HCI has come with a distancing from these original values. We argue here that one way of rekindling these values is to explicitly acknowledge 'making wellbeing' as a quality of any process of participant engagement in interaction design. Supporting the wellbeing of those who take part in our design processes is, undoubtedly, an ethical responsibility for interaction designers who work in wellbeing-related settings. We argue, however, that interaction designers who

engage in participatory research generally ought to be concerned with the wellbeing of their participants.

This is not to suggest that researchers currently do not care about participant wellbeing. Rather, time, financial and organizational pressures may limit how much attention the researcher can provide to their participants when wellbeing is not an explicit focus of the research. Interaction design is increasingly focused on long-term community-based projects that seek to provide value to society [15]. More often, these research projects require long-term commitment from participant communities. Providing positive experiences that enhance participant wellbeing and make explicit potential gains through creative forms of engagement may increase the likelihood of gaining the sustained engagement required to successfully conduct valuable social research. In this sense, caring for the wellbeing of our participants will provide benefit for interaction design beyond specific wellbeing-related projects. Thus, we urge interaction designers who lean towards participatory approaches to consider configuring their participatory experiences to provide moments of hedonic and eudemonic wellbeing.

We realize however that constructing design activities that can benefit the wellbeing of participants may be a daunting challenge. In the following we identify three strategies that other researchers in the HCI and design community may find useful as they construct their own design activities.

#### *Identifying Expertise Relevant to Making Wellbeing*

One way to ensure that design activities are carefully designed and beneficial to the participants is to ensure the participation of experts. However, it is important to identify the right kind of expert in the domain of experience being studied. For example, the work in the children's hospital was always led by the play specialists who would bring their expertise of working with children on a daily basis to the design of the activities that the children engaged in. Similarly, the creative activities for the women in the second case study were planned and conducted in conjunction with their regular hospital staff. In each of these cases, these experts came with extensive knowledge of the children and women who were participating in the research. They already had a strong sense of what is of interest to and would motivate these individuals as well as what challenges they faced in their lives. However, appropriate expertise may not always be derived from professional knowledge and experience. For example, in the third case study, it is arguable whether a neurologist may have engaged with the making aspects of the project and may have had a preference for providing medical expertise. Instead, in this case Gillian and John were considered experts of their own lived experience of dementia [46], with John supporting Gillian to complete the making activities. Together, John and Gillian were able to provide a window in to their past, which the researcher could use to create beneficial activities. It was the expert's relationship with

and understanding of the participants that helped create engaging activities that could 'make wellbeing'. We, thus, urge researchers to carefully consider who might be the appropriate expert in their research contexts, particularly as they may not always be found in the places we expect.

As well as identifying the 'right' expert, it's also critical to work with them to communicate the value that making activities may have on an individual's wellbeing. For example, while the play specialists led the activities in the first case study, there was still some skepticism around the agenda of this project. They did not trust that the activities could help the participants and seemed to believe they were only for the researcher's benefit alone. This was noticeable as sessions always ended with the specialists asking if the researcher had 'gathered enough information'. In the second case study, staff members exhibited greater trust in the potential benefits of the design activities. Thus, more attention was given to ensure participants were safe and had an enjoyable, beneficial experience. These differing trust levels likely influenced the impact each activity had on wellbeing. Our point here is that if we seek to construct design activities through which we aim to enhance participant wellbeing, we must also attend to how we can articulate this aim to key stakeholders. It is possible that by failing to carefully plan how we articulate the potential benefits participants can gain from our design activities, we may undermine the effort expended in the careful configuration of these activities.

#### *Balancing Creative Freedom with Specific Guidance*

In each case study, the activities that the participants engaged in had to carefully balance the creative freedom available to the participant with specific guidance required by the participants, or the setting, to enable activities that are sufficiently fulfilling and manageable. For example, to not overwhelm participants in the second case study, the women were gently supported in their choice of clay colors and carefully guided in the step-by-step process of creating very elaborate designs for their clay beads. In the third case study, Gillian's husband, John, was actively involved in making process around the probes while also creating his collage book of memories. This balance between openness and guiding the participants depends upon the participant group, their individual abilities and the context (e.g. in secure services materials are limited due to strict safety protocols). This raises important questions about how participants in making experiences can experience the eudemonic facets of wellbeing. For example, [18] found that careful construction of participation in textile computing workshops with young, at-risk girls was important. If an activity is too constrained, participants' sense of autonomy and competence are not likely to increase. An activity that is too simple will not enable participants to grow. On the other hand, activities that are too complicated and beyond their capabilities, will negatively impact these eudemonic aspects of wellbeing.

### *Being Responsive to the Participants during the Process*

Finally, while ideally we should create design activities that are useful for participants, this involves understanding what drives our participants. However, meaning may often only occur during the design process as we begin to better know our participants. In this sense, it is important that design researchers remain flexible and are responsive to the emerging needs of participants during design activities. For example, in the second case study, it was surprising that the women created far more beads, bead patterns, and bead shapes than the researcher originally envisioned they would. This required the researcher to adapt quickly by changing the planned design activity and supporting the participants in this creation process. In the third case study, Gillian's husband, John, actively extended the making process by autonomously creating a collage book of memories. This was an important, meaningful task for John, as it served to protect important moments from Gillian's dementia. Adapting to this by incorporating it in to the design activities increased the utility of the process for John and Gillian, as it attached a greater sense of meaning and purpose to the process. As a consequence, having a commitment to 'making wellbeing' in this instance also comes with developing activities that are contingent, session plans that act as a resource but are flexible, and indeed for the direction the research takes to be steered more heavily by the participants themselves.

### **CONCLUSION**

While the HCI community has become increasingly interested in understanding how design processes impact on participants, little attention has been explicitly given to how existing creative making practices in design processes can impact on wellbeing. Previous HCI research has observed that such making activities can provide an enjoyable experience and space for reflection. We have built upon this by illustrating, through integrating wellbeing theory and three case studies of making within the process of user-centered design, how the activity of making might impact on wellbeing in and of itself and urge the HCI community to begin considering this important concern.

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