Position Exchange Workshops: A Method to Design for Each Other in Families

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ABSTRACT

Existing methods for researching and designing to support relationships between parents and their adult children tend to lead to designs that respect the differences between them. We conducted 14 Position Exchange Workshops with parents and their adult children, where the child has left home in recent years, aiming to explicate and confront their positions in creative and supportive ways. We designed three co-design methods (*Card Sort for Me & You*, *Would I Lie to You?* and *A Magic Machine for You*) to support participants to explore, understand, empathize, and design for each other. The findings show that the methods facilitated understanding, renegotiating, and reimagining their current positions. We discuss how positions can help consider both perspectives in the design process. This paper seeks to contribute (1) how the notion of positions enables generating understandings of the relationship, and (2) a set of methods influenced by position exchange, empathy, and playful engagement that help explore human relationships.

CCS CONCEPTS

• **Human-centered computing → HCI design and evaluation methods**.

KEYWORDS

Parent-adult child relationship; position exchange; renegotiation of relationships; position exchange workshops; dialogicality; family relationships

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1 INTRODUCTION

Every family relationship, e.g., between parents and adult children, has its own particularities that makes the design process challenging for researchers. Existing methods for researching and designing to support relationships between parents and their adult children tend to lead to designs that respect the differences between them, as in [23, 41, 57]. Methods that contrast perspectives can lead to recognizing the differences in the importance that each person gives to common experiences and stories [27, 38]. We share this view, which in turn evolves the design in a positive way by embodying the different perspectives of participants and fostering an adjustment of those perspectives.

The aim of this research is to explore how design methods can use concepts from Position Exchange Theory (PET)[21], empathy, and playful engagement, to explore the relationship between parents and adult children after children leave home. According to PET, individuals understand others by being in and moving through different social positions and thus experiencing different perspectives as a natural phenomenon in life. We can see this in children's games such as taking care of a doll, where they position themselves as carers and engage in the practices of caring [21]. This approach extends beyond empathy, which is the ability to understand and share the feelings of another, by also building a self-concept in a dynamic and contextual way, based on the interactions with the other (i.e. position exchange) and how the other sees the world (i.e. positions). The integration of position exchange aims to help people stand in the shoes of the other and begin dialogue and perspective sharing in creative and supportive ways. We used playful activities because talking about the relationship between the parent and the child can be quite stressful, difficult, and challenging, and playful activities can diffuse tension, inject humor, and consequently lead to greater honesty and openness.

We conducted 14 workshops with parents and their adult children where the child has left home in recent years. We used our three methods to explore, understand, empathize and design for the other. During the first activity, *Card Sort for Me & You*, we talked about the media our participants used and how they communicated through current technologies. The second activity, *Would I lie to You?*, challenged participants to guess true and false facts about the other; after each guess, we discussed how they shared in relation to these facts that they sent to us. In the third activity, *Magic Machine for You*, we asked the participants to design a magical technology [6], from the perspective of the other, that would enrich their relationship.

By conducting these activities in a single workshop session, we found three ways in which position exchange was shown. First, we found that the workshops presented opportunities to acquire a better understanding of the positions of the other in different ways. We observed that parents and adult children take important elements from their relationship for granted, such as intimate physical interactions and common intimate family scenarios, and that the activities provided opportunities to explore and discuss those taken-for-granted positions. Second, the workshops allowed participants to challenge, question and renegotiate the position of the other. Participants contributed to and argued about the answers of the other; they felt they could talk about topics that they reported they would not have been able to talk about in a regular conversation. They learned something from the relationship and sometimes reinforced what they already knew of the other. Finally, participants could reimagine their positions as parents or children, revealing their desires and emphasizing their priorities in the relationship by expressing everyday activities they missed, their need to mediate distance or time, and finding ways to give something to the other.

This paper contributes to HCI research in two different ways. First, we identified ways in which positions provide new understandings of the relationships between parents and their adult children after children have left home. We show how they understand, renegotiate, and reimagine their relationship; we then suggest how we can move from here to new design ideas. Second, we present the Position Exchange Workshops, workshops with a set of co-design methods influenced by the concepts of position exchange, empathy and playful engagement that draws upon both an anti-solutionist [6] strategy to prompt reflection and then on conversations that converge to feasible ideas. These methods gave participants free rein to explore the relationship through the design activities by providing opportunities to ask additional questions, or complement the answers of the others, thus providing more depth and richness to the conversations. We see a potential to enhance the understandings that both researchers and participants may get from the relationship in order to design better technologies and methods for enriching it.

2 RELATED WORK

Position Exchange in HCI

Position Exchange Theory describes how people navigate through different social positions [21], which are understood as how we understand ourselves and act, not always intentionally, in different contexts [16]. By moving through different social positions, individuals accumulate experiences and integrate them, building their own perception of those positions [20]. We do this process in a dialogical way, having internal dialogue with our own positions and external dialogue when having differences with the positions of the others [21]. These differences can make the images that different generations have of each other contradictory and incongruent [34]. We show below how position exchange has been explicitly used in HCI, and how it is present in existing works in the field.

In HCI, PET was introduced by Durrant et al. [19] to understand how new retirees develop a new digital personhood. They found that adopting new positions should be supported by technology for contributing to growth and wellbeing. We build on position exchange to offer opportunities for renegotiating the relationship between parents and their adult children that lead to design ideas for enriching it.

Position exchange has a potential to change the ways that conversations flow. Lindley and Wallace [31] adapted their method by letting a participant conduct a creative session by teaching how to crochet. This changed the attitude of participants towards the environment, making it easier for them to express their thoughts on the same topics that the authors had asked in previous interviews and through probes. In these workshops, we provide ways in which participants can guide the flow of conversations by asking, interrupting, and contributing to the answers of the other.

Position exchange can contribute to the emergence of phenomena that would not be possible by combining knowledge from the two separate parts. Current works mostly focus on studying communication through existing technologies, and exploring the different perspectives moving towards designs that conciliate them [23, 41, 57]. In contrast, Vetere et al. [51] focused part of their study on the interactions that come when grandparents and grandchildren are together. Grandparents, while playing with their grandchildren, put themselves in the position of the child, imagining what they would do and trying to prevent harm; they showed how they play the role of a child when dancing and singing with them. Through the Magic Box, we see anticipation and dedication of thinking of the other, and the desire to give something

to please the other and keep getting their attention. We see potential for eliciting richer details in human relationships when applying methods to multiple parties at the same time.

The confrontation of different perspectives can provide new insights and negotiation of the importance of details on a common topic. However, relationships can also be dysfunctional; technologies may reflect discourses and play a role when there is conflict [12, 56]. In the Memory Dialogue method, Neumann et al. [38] collected two different perspectives into account for a single memory, and each participant had to create an artifact to cherish that memory, which they compared after presenting them to each other. In these workshops, we provide opportunities to consider these differences and renegotiate them, and thus build up from this towards new design ideas.

Designing for and with Families

Every parent-child relationship is unique. Trying to understand them, we use methods for making, telling and enacting because they allow understanding practices of people; these methods can cast new light on existing perspectives [8]. In this way, we should look for ways to give a voice to all participants and to give them a chance to articulate ideas [46]. In this process, mutual learning should be explicitly considered to enable both participants and researchers to benefit from the research process [45]. Leong and Robertson made workshops for voicing the values of older adults [30] and found that the use of different methods, such as an ice-breaker activity and the use of artifacts to support talking, made conversations be easier. Soro et al. [49] used probes to facilitate cross-cultural dialogues, finding that co-presence of researchers and participants is crucial to fostering engagement. From a co-design perspective, Mattelmäki studied how probes can enhance participation [35]. She found that the making process with probes was considered fun and rewarding, and that discussions can prompt reflections and experiences that motivate participation. We extend on these ideas by designing methods that stimulate mutual learning between parents and children about their own relationship, and between researchers and participants in playful exploratory ways [7], for discussing technologies and learning about what is important for them in their relationship.

Stories are a good facilitator of providing accounts of past experiences; they foster a dialogical reminiscence of a past event, and contain details and nuances that are unique to each individual [55]. Stories are a way to build empathy between participants and researchers, giving researchers brief snapshots of the perspectives of the participants [54]. This can be seen as an exchange of positions in which the participants are letting the researcher stand in their shoes through a personal account of their lived experiences [20]. In addition, family stories are also a taken-for-granted process that can offer opportunities for different generations to meet each other [27], which can reveal intimate details that relate to their emotions, physical interactions, expressions of affection and other ways of sharing intimacy [52]. We aim to build empathy between participants and the researcher through different methods, and to encourage personal reflection and position exchange with the parent or the child to elicit rich details of the relationship.

Fictions are a good way of telling stories and organizing the data from the lived experiences to create a narrative [14, 15]. When creating fictions, participants use different types of narratives that force participants to put themselves in scenarios that can challenge them, and that embody their expectations on future technology solutions [5]. Situating a fictional technology in a narrative makes us question the ethics, values, social perspectives and emotions in context [50]. We introduced the creation of fictional technologies for the other as an anti-solutionist method [6] letting participants present and discuss what they think is important for the other in the relationship instead of jumping to technological solutions immediately.

As individuals tend to create social experiences through technologies, design should focus on shared experiences [11], because individuals prioritize the social scenario over the technology itself [11, 29]. Several works have explored shared experiences in families through daily routines [4, 13, 37], awareness and ambient technologies that mediate distance [3, 10, 26, 32, 36, 53], video communication [2, 39, 40] and through senses and emotions [28, 42, 47, 48, 52]. We see a potential in designing with the other for creating social experiences that can enrich the relationship.

3 THE WORKSHOPS

The aim of the workshops was to generate a space that allowed participants to talk freely about their relationship and the mundane aspects of their interactions, and to generate a fictional technology that would enrich the relationship.

Guided by the concepts of position exchange and dialogicality, we brainstormed different methods to talk about technologies and the relationship itself, and to support participants in creating a technology for the other. We wanted to include playful activities that would enable participants to enjoy the session and have a comfortable and relaxed conversation. We looked at traditional methods, looked for inspiration in TV shows, and read different methods from HCI literature. The new methods were trialed with a dyad of participants, and we made improvements to them and to the workshop structure. Our three co-design methods were developed explicitly to foster exchanging positions, by getting participants to think about what the other would need and how the other would respond. *Card Sort for Me & You* was used to get participants to reflect on their technology-mediated

Figure 1: The three methods we designed, (a) *Card Sort for Me & You* for understanding commonalities and differences in the use of technologies, (b) *Would I lie to you?*, for investigating the relationship by asking what they know of each other, and (c) *A Magic Machine for You* for reimagining the relationship with a fictional technology. *Would I lie to you?* Logo: ©EndemolShine

communication with each other. *Would I Lie to You?* was about what they reveal to each other. *A Magic Machine for You* was for designing for the other, rather than for oneself. In 12 of the workshops, we contacted the parents through the video call technology that they preferred; we used Skype, WhatsApp and Viber. In the other two, we worked with both parents and children in person. All workshops were video and audio recorded. In this section, we describe our methods and the rationale behind them, and how these methods contribute to the Position Exchange Workshops.

Card Sort for Me & You

This method aimed to facilitate discussion about the technologies that participants used, and about how their relationship was mediated by their technology usage. Each participant was given a set of cards that showed different social media and communication tools, e.g., Snapchat, Skype (see Figure 1a). They were asked to sort them by order of preference, and the facilitator started a conversation to find commonalities and differences, and the communication practices of them and the rest of the family.

The rationale behind this method was to start a traditional and slightly predictable conversation with the participants, so they would feel comfortable for the rest of the workshop. Position exchange was not explicit in the cards. Instead, we aimed to elicit insights into positions through the discussion about the lists of preferences of participants.

Discussions of positions emerged by encouraging participants to find commonalities and differences in each other's communication preferences. The facilitator inquired about the ways that parent and child communicated (e.g., "which tool do you use to communicate with each other?"), what kind of content they shared and did not share (e.g., "what photos would you share on Instagram that you would not share on Facebook?"), and the ways that they communicated with extended family, e.g., group communication.

We decided to start the workshops with this method because it was useful as an icebreaker. Card sorting was an easy to grasp, established method that did not challenge participants and yielded useful information even though topics were not discussed in depth, unless participants led the conversation in that way.

Would I Lie to You?

Inspired by the homonymous TV show and the idea of deliberately lying to the other party, this method focuses on talking about the daily lives and preferences of the participants. For each topic that was raised during this activity, the facilitator fostered a discussion about how participants shared. Prior to the workshop session, participants were asked to send five true and five false facts about themselves. These facts were related to their preferences, tastes, and activities they liked to do. Participants were told that the other party should not easily guess if the phrases were true or false. After each reply, we led a conversation about the potential interactions that were linked to the phrase.

The rationale behind this method was to make participants think about their own lives and about what the other might know about them. This method gave participants the chance to set the agenda for this part of the workshop, and provided the research team a list of topics of interest of the participants that made asking spontaneous follow-up questions easier for the facilitator.

In this method, position exchange was implicit in the questions and responses of the game. We did not explicitly introduce the concept of position exchange to participants – participants were simply instructed to play the game and to discuss their responses. To elicit further discussion about positions, the facilitator asked participants to describe what they knew about each phrase, to look for potential interactions related to the phrases, and to look for possible differences between the current situation and the time when parent and child lived together. For example, if one phrase related to plans for traveling, the facilitator could ask about travels they shared, holiday trips, favorite destinations, common motivations for traveling, etc.

This method was important to the workshop because it allowed participants to challenge what they knew of each

other through the true and false phrases. Guessing encouraged them to think from the position of the other, and if they knew the answer, it reinforced what they knew of the other.

A Magic Machine for You

The aim of this method was to create Magic Machines [6] for the other, a lo-fi fictional technology, following a design brief created by the other, imagining the world from the perspective of the other. During the previous methods, the facilitator took notes on some highlights of the relationship that might be potential topics for building a Magic Machine for enriching the relationship. Parent and child defined a topic, or design brief, that defined their desired technology. Then, the facilitator asked the participants to build a Magic Machine, following the other's brief and putting themselves in the position of the other, i.e. the parent built the Machine that the child wanted, imagining they were standing in the child's shoes, and vice versa. Participants were asked to show and explain how the Machine was used, and then the other party was asked if their expectations were fulfilled by the Machine, and if they would add something to it.

The rationale behind this method was to generate a tangible fictional prototype that embodied both self-expectations and the perceptions of the expectations of the other on the relationship. We also wanted to provide an opportunity to tell a story of how their relationship would be better in this fictional scenario. These stories could generate discussions that explicitly showed the differences between the positions of participants, and could provide an opportunity to renegotiate their expectations.

During the presentation of the Magic Machine, position exchange was encouraged by the facilitator through questions that related the design idea to the situation of the other person. For example, if a parent designed a Magic Door for visiting the child instantly, the facilitator could ask *"how many hours would your child allow you to be there?"*, *"would you have to knock the door before getting to the other side?"*, etc. After the explanations, the facilitator initiated a discussion on the important aspects of each Machine, and asked participants if they could imagine a more feasible technology that included these aspects in the design.

We decided to finish the workshop with this method because it let participants design for each other while imagining themselves in the shoes of the other. This method allowed participants to create stories and to generate a dialogue about the important aspects of the relationship for them by incorporating position exchange in the design activity.

Participants

We conducted 14 workshops in which 14 adult children (C) and 16 parents – 14 mothers (M) and 2 fathers (F) – participated. Parents were aged between 50 and 63, and children between 22 and 36. All children were currently living in Australia, and their parents lived in different countries, namely, the Philippines (M1), Australia (M2, M8 and M12), Colombia (M3, F3, M4, M6, M9 and F9), Malaysia (M5 and M11), Chile (M7), Turkey (M10) and USA (M13). All children left their parents' home less than 6 years ago.

We recruited participants through social media posts on different websites and Facebook university groups. We let the children decide if they wanted both of their parents to participate, or just one of them. Our recruitment strategy led mostly to the involvement of international students whose parents lived overseas. We did not delve into an analysis of the cultural differences, despite the diversity of countries of origin. In line with Irani et al. [24, 25], we see culture as a dynamic and hybrid concept that is not exclusively defined by country of origin. Instead, we hope to provide a new alternative to co-design technologies that enrich the relationship between parents and their adult children.

Analysis

Analysis started immediately after each workshop through notes and mind maps while listening to the recordings. We created affinity diagrams for the generated Magic Machines and found themes that emerged from these fictional technologies. We then transcribed the workshops and analyzed the verbatim. We started looking for examples of position exchange, and identified common themes in them. This process was guided by the principles of a thematic analysis [9], which involves phases of familiarization with data by reading through transcripts and reviewing video recordings, generation of initial codes, searching for themes, reviewing themes, and writing a report. We analyzed the workshops looking to understand how the positions of parents and adult children were presented in the workshops, how they understood and challenged the positions of the other, and how they thought about the relationship in the future.

4 FINDINGS

First, the findings describe how parents and adult children benefited from a mutual understanding of their positions. Then, we show how the workshops provided opportunities to challenge and renegotiate the positions of participants. Finally, we show how participants reimagined and explored their relationship.

Understanding Positions on Communication with the Other

We found that the acceptance of the positions of the other on communication benefited their relationship. We observed that children eventually tend to understand the positions of their parents as they define their positions as adults.

Accepting the Positions of the Other. We observed that accepting the positions of the other on communication led to an understanding of the needs of the other. This was reflected on two opposing perspectives of technology from two pairs of participants. M11 used to track the location of C11's phone online to see where she was when she was out at night. Perhaps surprisingly, C11 felt fine with it because she feels that her mother does not judge her actions or decisions.

C11: I turned off my location because I was sitting an exam, and then she got so worried she pressed the alarm button so it just started ringing, IN MY EXAM! (laughs)
M11: (laughs out loud) Now I don't do that, I just message her. It was just if you don't turn it on always, you know I will do this.
R: So from there you don't turn it off
C11: Yeah, yeah (laughs)
R: And how long did it take you to be comfortable with that?
C11: Six months? After that I was just like yeah...

Expressing a different point of view, both C10 and M10 agree on the limitations of current technologies, and think that more awareness or communication frequency would become invasive to the detriment of their relationship. After talking about their *Magic Machine for You*, C10 said it would be *"a bit creepy"* to have any awareness of when her parents woke up, and that estimating based on her knowledge of their routine is fine for her. She added that phone conversations were good enough for their communication. M10 reinforced this idea by comparing how she communicated with her parents through letters, and how technology allows them to talk in real time now.

R: How do you think that you give that support to her?
M10: Also conversations is important for support, but texting is not the same, you can't share your emotions in texting.
R: Do you feel that need of emotional support sometimes?
C10: Yes, I do.
R: How do you think that that can be improved?
C10: I don't know, I think it can't. Psychology is pretty good right now at this. Talking on the phone whenever you want is pretty good.
R: Is it good enough?
C10: I think it's enough.

Children Understanding Positions of Parents. Adult children commonly understand the positions of parents as they grow because they can relate the experiences they are living as adults with their own experiences when younger. In the case of C2, she became closer to M2 after having bad experiences living away, and her mother gave her emotional support. Since then, she understands the need of M2 to be more in touch with her, and she feels that need as well.

Relating experiences was particularly relevant for two of the adult children that participated in this study who were also parents. In both cases, they reported an understanding of their own parents' (who were now grandparents) communication needs, the importance of sharing time with their own child, and sharing the growth and progress of their child with their parents. These new grandparents were aware of how their adult children had changed and were happy to see them giving value to family and communication. C5 stated the importance of his child for him in a phrase for *Would I lie to you?*: "My new hobby is spending time with my newborn daughter". This, of course was true! C5 and M5 discussed the importance of having daily communication during the *Card Sort for Me & You* method.

Figure 2: Magic Machine for You by (a) C1, and (b) C5

C5: I actually understand now the need of having that day-to-day communication because you are talking about a bigger kind of family relationship now, where I obviously have my mom's granddaughter here, I have my wife here, who my mom cares about so you sort of need that communication to go every day because if we were back there in Malaysia we would obviously be doing the same thing where my mom would wanna see her granddaughter every day [...]
M5: There's the drastic change in [C5]! When he was a student, single, and now he's married, he has become much much better.

The *Magic Machine for You* that both children created shared interactions between their own children and their parents. In the case of C1, she created a sharing box that allowed M1 and her grandchildren to exchange objects and photos, and C5 thought of magical gloves that would allow M5 to touch and feel her grandchild (see Figure 2). Knowing that his child likes to touch things, C5 also proposed a magical screen where his child would be able to feel her grandmother's face during a video call.

Eliciting Intimate and Important Interactions. We observed, understandably, that it was particularly hard to get to talk about the intimate interactions and details that make each relationship different, but these details did emerge spontaneously, once participants were immersed in activity. In the workshops, although participants generally desired magical co-located physicality, in several cases they went on to reveal very particular interactions they missed; the smell of hair, the warmth when sharing a bed, or a conversation during a walk on the park. In the *Magic Machine for You* created by participants, both parents and children tended to imagine virtual worlds with multi-sensorial devices that allowed an experiential synchronous sharing, where physical interactions were initially limited to holding hands, hugs, eating

together, or walking together. In later conversation participants talked about more intimate and playful interactions such as smelling their hair and lifting the parent up! Figure 3 shows some examples, in which M7 and M2 created a teleporting machine, C6 created a magic virtual room where M6 could visit him and C8 created a virtual traveling room, where the family could dine on different countries.

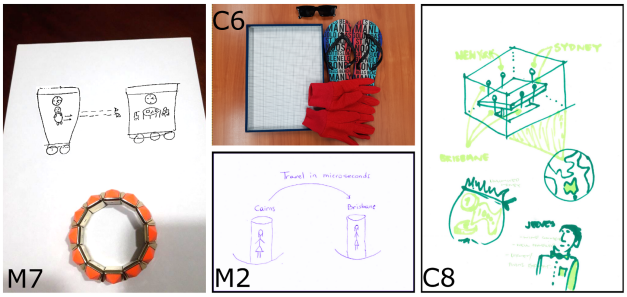

Figure 3: Magic Machines examples from Participants

For M6 and C6, the importance of physical contact in the relationship between C6 and both parents was discussed just minutes before the end of the workshop. Their *Magic Machine for You* allowed them to hold hands and hug, but did not explicitly allow them to do some characteristic ways of interaction between C6, his brother and their parents that they missed. We asked about details of how they would imagine themselves using that machine, and about the importance of the elements embodied in them, such as physical contact.

R: [...] So if you could incorporate touching, for example, an occasional handshake, cuddling on an arm, small elements, would you think that this would help you? Maybe it's not enough, but do you think it could enrich your relationship?
C6: Yes, I would think so, sure.
M6: Yes, because they pamper me a lot, they lifted me up, grabbed my hair, kissed and smelled it. It's important to remember all those contacts.
R: Then physical contact was an important part of your day-to-day.
M6: Yes [C6 nods too]
C6: With both of them, with my dad too. I bothered him a lot.
R: Joking, by pushing him, something like that?
C6: Yes, I would bother him, I rubbed my beard on his forehead...
M6: They [C6 and his brother] jumped over him, they were big, both of them, and they both would [jump] over his dad.

Similarly, C14 and M14 stated they feel comfortable having intimate conversations when walking because they do not have any distractions and they do not like to look at the other person in the eyes when having a deep conversation. This was discussed after talking about the *Magic Machine for You* created by M14, who proposed a magic airplane that would allow C14 to travel quickly to her place after finishing her daily work. After traveling, they would go for a walk around the neighborhood.

M14: [...] So walking is a good way, you got no kind of distractions, you can just talk.
R: So that would be a good time for you to have intimate conversations.
[Both say "Yeah, yeah, definitely"]
R: Are there any other instances where you have that kind of conversations or do you think that walking is a good scenario for that?
C14: I think walking because the thing is I'm not very comfortable with looking people in the eye when I'm having an intimate conversation, so from walking I can just... not distract myself but I can look at other things and the other person's looking at other things.

Giving importance to what the other does was also important. Some participants revealed, probably without intention, impressions about the value that they gave to ways of interacting with the other. This was noted by M5, who sent messages through WhatsApp after the workshop. She thanked the research team for the session, and shared her happiness because C5 had praised her cooking, something he had never done before.

M5: After the video call I was in tears. Tears of joy. My other children would praise my cooking at the dining table. But not [C5].

Providing Opportunities for Renegotiating Positions

The experiences of parents greatly differ from their children's, and their own cultural and family backgrounds have made them build positions that may be completely disconnected from the context in which their children are currently living. We found that the workshops allowed different views to be shared and confronted by parents and children.

Challenging Positions of the Self and the Other. The workshops presented an opportunity to renegotiate the positions with the other in various ways. The sessions allowed participants to challenge their own knowledge, and the positions of the self and of the other. Many participants submitted phrases for *Would I Lie to You?* related to values, taste and preferences in daily activities, and to personality traits and behavior. These phrases led to conversations linked to previous experiences of both parties and to reinforcing or challenging what they knew of their relationship.

The challenge of the positions was sometimes explicit and could be related either to the positions of the other (C13: *"[True] I think you like me less than [my brother]"*), or to the own perspective (M11: *"[False] I am always frank and tell people how I actually feel"*). When talking about this last phrase, C11 raised her concern on having to ask M11 how she felt in different ways because she felt that it was hard for M11 to tell anyone her true feelings. This was reflected in the Magic Machine that M11 created, a magic cap (Figure 4) using one of C11's caps that shows a hologram of herself that does not hide things from C11. In essence, she designed something to reveal her more honest self to her child.

Figure 4: Magic Machine for You created by M11

The workshop was an opportunity to bring topics that could not easily be raised in regular conversations. This was expressed by M12, who found the workshop useful because she wanted a better relationship with C12 and *"did not know how to start that anymore"*, but in the workshop she *"was able to say things that I wouldn't be allowed to say"*. C12 was not aware of how important he was to his extended family. M12 talked about how their relatives ask for him and are interested in what C12 says. While she talked, C12 installed Viber in his phone again and rejoined the family group.

M12: Whenever they see "[C12]" and a little comment, everybody talks about [C12], giving all these good vibes and say "We love you". Whereas anyone else just gets nothing, but [C12] puts something on and it is like the whole world turns to him, it is like "Oh, that's great [C12]! Good, good!"

Children tended to manage the impression they give over different social media and sometimes published content in one medium that would not be visible to their parents. Some parents challenged this behavior asking the adult child to include them more by sharing with them also. During *Card Sort for Me & You*, C1 used to post photos of books she liked and photos of snacks she had when she was stressed at work. She did not want to share these "nonsense" photos, but M1 said she also wanted to see when she felt like that.

C1: I consider them as nonsensical posts; if I'm stressed I eat KitKat. I buy a KitKat, and before opening it, I take a photo of it and share [on Instagram]. It's not really something that I wanna share in Facebook
M1: For you, for you, for you, but for us it's really important
C1: OK, ok [laughs]

Reinforcing What They Know of Each Other. The dialogue about the perspectives of the other created opportunities to reinforce what they felt about each other, although this was not a particular intention of the workshop design. Participants often reported feeling glad about confirming how well they knew the other, and learning about small changes in the other that sometimes were not discussed. C9 said that the workshops allowed her and her parents to look back on their relationship and see how it has evolved.

C9: you usually do not take time to remember how things were before, how we have changed, the things that we have improved. So it is nice to look back and see how there has not been a setback in the relationship, but that we have improved many things and we have been able to maintain, and even improve the relationship in spite of the distance.

Explicating Generational and Cultural Gaps. Children often recognize there are differences in the perspectives with their parents that they will never overcome. These differences may affect the decisions children make, but they often act independently and deal with the tensions later. C6 wrote a phrase for *Would I lie to You?* about his desire to have tattoos all over his body, and said that his father has had a hard time accepting the fact that he got tattoos.

C6: My dad is very old school, he's one of those that says that tattoos are for felons, and he has that in his head, which doesn't mean it's wrong, but although that [his view] has changed over time, he still rejects it and has a hard time accepting it.

Although parents sometimes disagreed with their children's decisions, they tolerated them. M6 did not like tattoos at all, and if it were up to her, she would remove them from C6's body, but she accepts it is not up to her.

R: How did you react when you realized [C6 had a tattoo]?
M6: HA! My God...
[Conversation on tattoos continues, talking about designs C6 would like]
R: And if you could give a tattoo idea to [C6], would you do it?
M6: No [C6 laughs], because I don't agree. If it were up to me, I would remove them all.

Some parents acknowledge the generational gap from their own position on having left home when they were young adults, but feel that as mature adults they know better than their young adult children. M2 justified C2's answers to dismissing physical contact saying *"[C2] thinks as a child, she does not think as a mother"*. C2 was not surprised by M2's reply, stating that it was *"hard for me to stand in my mom's shoes, it's like I... I can't reflect myself on her, I don't know"*. However, for C13 and M13, not dealing with these differences and admitting they would always exist seemed to be a source of conflict in their relationship.

M13: As a human being you always, every time you would [find] this kind of collision when they come, and it never [is] going to sort of stop.
C13: So you are saying disagreements will always happen?
M13: Yes.

Digging deeper into the conversation between M13 and C13, diverging expectations and a lack of willingness to change positions may influence the relationship. C13 was aware of this reluctance to change, which she expressed during different activities in the workshop.

C13: We come from different generations, so [we have] different priorities. [...] Growing up the way she did and the skills she's learned, it would take me years to be able to master that. So I don't think we'll ever see eye to eye in anything in terms of what would better our relationship because for her it's fine, and I'm no one to be able to argue that it's not. [...] My mother has her standards and I have mine, she's not gonna work towards my standards because she's satisfied with hers
C13: If I had to create a machine it would be to create that desire... to want to evolve. Because some people just don't have it, and you can't create it

Reimagining Positions on the Relationship

Sharing Everyday Activities. Some dyads shared everyday activities in their Magic Machines (C3-F3M3, C4-M4, C6-M6, C9-F9M9, and C11-M11). They often noted the interactions that they missed, or could accurately think of the expectations or concerns that the other would have. C3 could easily imagine different ways of providing awareness to F3 about several of his concerns, namely *"where he is sleeping, what facilities he has where he is sleeping, [...] transport, comfort, the neighbors, how they treat you, if there's respect"*. M4 and C4 shared the *"sacred ritual of sharing the bed and lazing about"*, for which M4 designed a magical blanket that would allow them to cuddle (see Figure 5). Interestingly, the context where they would use it was flexible: probably a Sunday afternoon, watching TV (it did not matter if both were watching or not) and one of them would probably fall asleep. After showing it, M4 kept using the magical blanket until the end of the workshop.

Figure 5: M4 showing a Magic Blanket designed for C4

Mediating Distance and Time. Since most of the dyads were living in different countries, it was not surprising for us that many Magic Machines were designed for sharing presence by mediating distance and dealing with different time zones.

Distance was mostly alleviated by teleporting machines (M2, F9M9, C4, and C6) and virtual shared rooms (C6, C8, and C9). These ideas were often presented by dyads that lived in different countries. However, while M8 lived in the same country, C8's Magic Machine allowed interacting with other relatives that lived overseas. In the case of M14, she designed a Magic airplane for her daughter, even though they lived in the same city.

Time zones and availability were common concerns for participants. Coordinating communication and missing the opportunity of sharing at certain times, e.g. lunchtime, motivated the creation of Machines that could manipulate time. C7 created a teleporting machine that would work while she sleeps, so she could travel to her home country without interfering her routine; M7 also created a machine that made her travel in time to share with her daughter. Both M10 and C10 designed machines for switching from one time zone to the other, so they could spend time together at the same hour.

Gifting. Parents often gave more importance to the lives and actions of their children than to themselves; they would usually think of their children first, and give them something without expecting anything back. This could be reflected on an example from M10, who was writing a secret diary as a gift for C10 while she lived abroad.

The idea of giving something to the child with nothing expected in return was also reflected in the design of the Magic Machines. Two of the several functions of M1's machine were explicitly about C1 (see Figure 6a). One button provided special oils for C1's hair, and the machine had magic scissors that would allow M1 to cut C1's hair over a distance (see Figure 6b). M8 created a Magic ticket for C8, who wishes to travel more in Australia and abroad. The ticket allows C8 to go to different places he wants to visit, and cities where their relatives live (see Figure 6c).

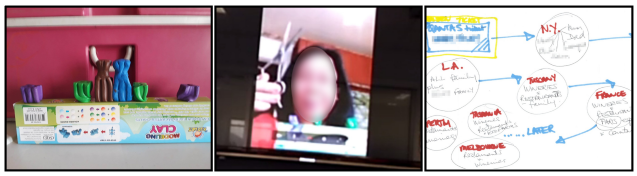

Figure 6: (a) M1's Magic Machine, (b) M1 showing her Magic scissors, and (c) M8's magic ticket for C8

5 DISCUSSION

Our literature review revealed that most research with families relied upon interviewing individuals, and that the resulting designs seemed to accommodate their differences [23, 41, 57]. However, there is a growing body of literature that is beginning to explore different perspectives in relationships [27, 38].

We set out to explore how parents and their adult children might see the positions of the other and whether they could design while taking into account the perspective of the other, and what is acceptable to them, in order to create richer ways and technologies to support relationships.

Overall, these methods seemed successful unearthing perspectives of participants on the relationship; participants

took the opportunities to state their positions and challenge the positions of the other. Participants often felt pleased about what they learned, and some expressed a renewed feeling of closeness following the workshops.

This paper seeks to contribute (1) how the notion of positions helps HCI researchers understand the relationship between parents and adult children, and (2) a new set of methods influenced by PET and the concepts of position exchange, empathy, and playful engagement. We will now discuss how the notion of positions helps in understanding relationships, how position exchange in the methods contributes to the generation of understandings, and we reflect on the workshops and their limitations.

Understanding Relationships by Making Positions Explicit

Position Exchange Theory, while very inspiring, is also somewhat abstract. The methods developed in this work found ways to concretize and mobilize the theory in the service of discussion and design. Using the notion of positions, we encouraged to and fro between participants, rather than allowing one to dominate. Parents and children took turns to talk about their family and technologies, and they designed for each other, with the researcher acting in a moderating role. Participants took turns in card sorting, contesting lies, and they worked in parallel to create a design for the other. Balancing participation between family members was particularly important because family relationships can be asymmetric, even in the ways in which technologies are used [17, 32, 33]. Jones and Ackerman [27] sought the perspectives of tellers and listeners of family stories, contrasting their impressions separately. Neumann et al. [38] compared different perspectives on a single memory through joint interviews after the participants built an artifact for the other.

Participants were provided with opportunities to make their own positions explicit to the other and thus the other party could contrast and discuss their own positions on the same topics. This process was useful for triggering instances of renegotiation and questioning of perspectives that could contribute to finding middle ground in topics that may be hard to discuss, by alleviating the tensions between the different positions [21]. With this, we looked for points of shared engagement in a non-conflictual manner, where both parents and children converged their perspectives into common desires and ideas that would benefit their relationship.

Co-design through Position Exchange

The dialogical perspective of position exchange contributed to the design of communication technologies for families because current social media mainly focuses on self-presentation to a particular audience [18], video calls and chat often may not go beyond what each family member decided to disclose [1, 43], and conversations can remain on the surface. The Position Exchange Workshops provided an opportunity for breaking out of the existing positions and going beyond what was taken for granted in the relationships.

The methods revealed a wide variety of family relationships in terms of what they understood of the other, what they were willing to reveal to the other, how tolerant they were of their differences and how much they were willing to change. Each method had a clear purpose – to understand and shed new light on the other through sharing in fun ways. Each method acted as a stepping stone for the next one, moving from familiarization and understanding through to reimagining future relationships and design.

By introducing methods that encouraged changes in perspectives that may cast new light on the relationship [8], we were not designing for what the relationship was, but for what parents and adult children wanted it to be. The workshops took an anti-solutionist approach [6] and then an approach of convergence towards creating and resolving design ideas. On the one hand, we aimed to encourage reflection by fostering a dialogue to understand the positions of participants on the relationship; on the other, we discussed how to move towards feasible technologies that would enrich the relationship. This was explicitly done in *A Magic Machine for You*, where participants had to imagine fictional technologies for their future relationships, followed by a discussion on ways in which these technologies might be feasible and desirable, in search of possible realizable designs.

In reimagining relationships through Magic Machines we found that parents and their adult children often wanted to share everyday activities and mediate distance and time. Some parents looked for ways to give something to their children without expecting something back. Although these findings are similar to previous work on presence-in-absence and sharing gifts and memories in family relationships [22, 38, 51], our findings also highlight that people can value different elements from a common experience and that designing with the other offers an opportunity to reflect on what is important for each family member and to move towards a design that fits the expectations of both parties.

By providing opportunities to challenge the position of the other, we were taking the confrontation of positions into account instead of dealing with independent and separate reports of the differences. This approach can evolve the design in a positive way by embodying the different perspectives of participants instead of respecting the differences articulated by them. The *Would I Lie to You?* method prompted reflection about the self and the other prior to the workshop, which contributed to the creation of an environment of comfort and dialogue for talking about an intimate relationship. Participants could set the starting point of the discussions that

were held in this part of the workshop by having the freedom to decide what to include in the phrases they submitted prior to the workshop session. This facilitated the confrontation of positions, the potential generation of instances of renegotiation of positions, and gave participants a chance to question and reinforce what the other said. It also injected some fun, humor and levity into the proceedings, trying to guess what was true, and what was false, with some things being obviously true and others obviously false. To quote comedian Carl Reiner, "The absolute truth is the thing that makes people laugh" [44].

We acknowledge that position exchange is a continuous process that is performed across the whole lifespan, and that an understanding of the positions of the other cannot be achieved in a single workshop session. However, we saw these instances, similarly to Lindley and Wallace's probes as 'tickets to talk' [31], supporting conversations in which participants not only talked about certain topics, but also raised their own concerns and decided to challenge, or not, the position of the other. These conversations could reveal particular intimate details of their interactions, which were important for participants and which they usually took for granted. Telling stories was a good way of capturing and describing lived experiences [55], and telling stories together reflected the different positions on a common lived experience. This increased the amount and richness of details that participants reported because the interactions they had could trigger more memories and debate in relation to the common experience.

Both confrontation and raising particular intimate interactions can evolve into design decisions that will embody the perspective of both parties and that can benefit the relationship. Some examples could be looking for ways to share warmth and presence through a blanket for M4 and C4, and to explore how technology can facilitate intimate conversations that respect the setting and the expectations of M14 and C14 in ways that feel more personal than a phone call or video call, i.e. considering the context in which they talk and that they do not like to look each other in the eye when talking about intimate topics.

Reflections and Limitations

Participants appreciated the focus of the workshops and the opportunities provided, and it appeared that they neither felt examined nor like a respondent. The methods intended and appeared to give them freedom to have open conversations in which their own family dynamics could be expressed, e.g. referring to the other with nicknames, laughing and interrupting without worrying about disturbing the flow of the workshop.

The activities provided a structure, but the nature of the activities was such that participants easily took ownership over the flow of the workshop by asking questions, refuting the views and impressions of the other, and contributing to what the other said. This structure, in turn, gave participants the impression that they were in charge of the conversation, with the researcher taking a step back. However, in reality, moderating a session was a demanding role for the researcher which comprised encouraging productive engagement, valuing responses, empathizing, and keeping the workshop moving along within the time constraints.

The different settings of the workshops affected the conversation flow in several ways. Having the participants in the same room made the communication between parents and their adult children more fluent. They could easily say something to each other with their body language and facial expressions that cannot be fully enacted on video calls. Interruptions and joint talking and laughter were more common and did not derail what the other was saying. They were more able to tell stories together. On the other hand, having a remote participant on a video call, and commonly a short delay in the call, meant that interruptions briefly stopped the conversation, mostly to ask for clarification. The effect was that participants took turns to talk, or prompted each other to answer questions, and they were forced to pay more explicit attention to the other. The video call also had an emotional component because most participants had not met with the other in person for months or years, and they valued that the workshops gave them a different setting to interact, taking them out of their daily context and encouraging them to focus on the other.

The rationale behind these workshops could be useful for other kinds of groups where there are asymmetric relationships that are developed over long periods of time, and a recent change in the context of one person leads their positions to change. For example, an apprentice turning into a full time employee, a student who becomes an academic, or intimate relationships that change into long-distance relationships. Prompting conversations may raise details that are taken for granted from each position, and this may help participants to learn about the position and lead to design ideas. This may be done by creating, or adapting existing methods that explicitly foster exchanging positions in order to understand, challenge or reimagine existing positions.

On reflection, we realized that the workshop outputs themselves (i.e. the Magic Machine designs) were not necessarily the major informant of design understanding, as is consistent with the intent of the Magic Machines method [6], which aims to develop meaning through investigative objects. Rather, the participants really enjoyed the methods themselves for the discussions that they evoked, which revealed position exchanges and insights into the other and reflections back on the self. As a result, we are now looking

towards how we might extend these methods on a continuing basis, through some form of technology probe that might enable users to present, for example, everyday true or false questions in a fun way, fostering dialogue and position exchange.

We identified four potential limitations for the workshops. First, participants' willingness to have open and relaxed conversations (which are helped along by the methods) is crucial; feeling stressed or anxious can mean that conversations do not flow naturally or simply that the workshop cannot continue, as happened with C12 and M12 the first time we met. Because C12 had lost an important document and was flustered, the session lasted less than 10 minutes; we rescheduled and ran a successful workshop later. Second, the existence of a big gap between the positions of participants, together with a lack of willingness to negotiate that gap can affect the outcomes of the workshop. Conversations can turn into arguments that do not contribute to the relationship and may not lead to design ideas. We observed this in the workshop with C13 and M13, where the values of M13 were strongly defined by her background and she acknowledged that there would always be differences between her and C13. In these cases, the methods could be modified using more therapeutic approaches. Third, our recruitment strategy allowed children to decide which parent would participate, and we did not balance the number of fathers and mothers. Finally, the presented methods require that participants engage in a session that lasts around two hours, limiting the populations where they can be used. Methods may need to be modified to target other populations, e.g., using shorter games to engage with younger children.

6 CONCLUSION

We set out to explore how parents and their adult children might see their relationship from the position of the other, by adopting Position Exchange Theory and developing fun, creative and supportive methods, to concretize and utilize this theory. We aimed to support a design conversation in which they could take the perspective of the other in order to create richer ways and technologies to support their relationships.

The methods seemed to unearth the perspectives of participants on the relationship successfully. Participants often felt they learned something, or reinforced what they knew of the other.

The methods revealed a diversity of family relationships in terms of what they understand of each other, what they are willing to reveal to the other, how tolerant they are of their differences and how much they are willing to change.

This paper has two main contributions. First, we contribute an understanding of how parents and children understand each other, how they constantly renegotiate their relationship and how they envision and reimagine it in the future. Second, we present the Position Exchange Workshops, which consist of a set of co-design methods that foster position exchange and dialogue in playful ways. With this approach, we embraced the diversity of family relationships by eliciting and valuing the richness of the particular interactions of each family. We hope that this paper inspires future HCI research to understand, negotiate and reimagine social positions in families, amongst friends or co-workers, and in communities.

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REFERENCES

[1] Morgan G Ames, Janet Go, Joseph 'Jofish' Kaye, and Mirjana Spasojevic. 2010. Making Love in the Network Closet: The Benefits and Work of Family Videochat. In *Proceedings of the 2010 ACM Conference on Computer Supported Cooperative Work (CSCW '10)*. ACM, New York, NY, USA, 145–154. https://doi.org/10.1145/1718918.1718946

[2] Uddipana Baishya and Carman Neustaedter. 2017. In Your Eyes: Anytime, Anywhere Video and Audio Streaming for Couples. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW '17)*. ACM, New York, NY, USA, 84–97. https://doi.org/10.1145/2998181.2998200

[3] Elizabeth S Bales and Siân Lindley. 2013. Supporting a Sense of Connectedness: Meaningful Things in the Lives of New University Students. In *Proceedings of the 2013 Conference on Computer Supported Cooperative Work (CSCW '13)*. ACM, New York, NY, USA, 1137–1146. https://doi.org/10.1145/2441776.2441905

[4] Pollie Barden, Rob Comber, David Green, Daniel Jackson, Cassim Ladha, Tom Bartindale, Nick Bryan-Kinns, Tony Stockman, and Patrick Olivier. 2012. Telematic Dinner Party: Designing for Togetherness Through Play and Performance. In *Proceedings of the Designing Interactive Systems Conference (DIS '12)*. ACM, New York, NY, USA, 38–47. https://doi.org/10.1145/2317956.2317964

[5] Mark Blythe. 2017. Research Fiction: Storytelling, Plot and Design. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. ACM, New York, NY, USA, 5400–5411. https://doi.org/10.1145/3025453.3026023

[6] Mark Blythe, Kristina Andersen, Rachel Clarke, and Peter Wright. 2016. Anti-Solutionist Strategies: Seriously Silly Design Fiction. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*. ACM, New York, NY, USA, 4968–4978. https://doi.org/10.1145/2858036.2858482

[7] Eva Brandt. 2006. Designing Exploratory Design Games: A Framework for Participation in Participatory Design?. In *Proceedings of the Ninth Conference on Participatory Design: Expanding Boundaries in Design - Volume 1 (PDC '06)*. ACM, New York, NY, USA, 57–66. https://doi.org/10.1145/1147261.1147271

[8] Eva Brandt, Thomas Binder, and Elizabeth B-N Sanders. 2012. Ways to engage telling, making and enacting. *Routledge international handbook of participatory design. Routledge, New York* (2012), 145–181.

[9] Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3, 2 (2006), 77–101. https://doi.org/10.1191/1478088706qp063oa

[10] Margot Brereton, Alessandro Soro, Kate Vaisutis, and Paul Roe. 2015. The Messaging Kettle: Prototyping Connection over a Distance Between Adult Children and Older Parents. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*. ACM, New York, NY, USA, 713–716. https://doi.org/10.1145/2702123.2702462

[11] Jed R Brubaker, Gina Venolia, and John C Tang. 2012. Focusing on Shared Experiences: Moving Beyond the Camera in Video Communication. In *Proceedings of the Designing Interactive Systems Conference (DIS '12)*. ACM, New York, NY, USA, 96–105. https://doi.org/10.1145/2317956.2317973

[12] Jamika D Burge and Deborah Tatar. 2009. Affect and Dyads: Conflict Across Different Technological Media BT - Media Space 20 + Years of Mediated Life. Springer London, London, 123–144. https://doi.org/10.1007/978-1-84882-483-6_8

[13] Min Zhen Chai, Alessandro Soro, Paul Roe, and Margot Brereton. 2017. Cooking Together at a Distance: Sustain Connectedness for Long Distance Families. In *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '17)*. ACM, New York, NY, USA, 2437–2444. https://doi.org/10.1145/3027063.3053183

[14] D Jean Clandinin. 2006. Narrative Inquiry: A Methodology for Studying Lived Experience. *Research Studies in Music Education* 27, 1 (dec 2006), 44–54. https://doi.org/10.1177/1321103X060270010301

[15] D Jean Clandinin and Vera Caine. 2008. Narrative Inquiry. In *The Sage Encyclopedia of Qualitative Research Methods*, Lisa M Given (Ed.). SAGE Publications, Inc, Thousand Oaks, CA, 542–545. https://doi.org/10.4135/9781412963909.n275

[16] Bronwin Davies and Rom Harré. 1990. Positioning: The Discursive Production of Selves. *Journal for the Theory of Social Behaviour* 20, 1 (1990), 43–63. https://doi.org/10.1111/j.1468-5914.1990.tb00174.x

[17] Hilary Davis, Frank Vetere, Martin Gibbs, and Peter Francis. 2012. Come play with me: designing technologies for intergenerational play. *Universal Access in the Information Society* 11, 1 (2012), 17–29. https://doi.org/10.1007/s10209-011-0230-3

[18] Michael A DeVito, Jeremy Birnholtz, and Jeffery T Hancock. 2017. Platforms, People, and Perception: Using Affordances to Understand Self-Presentation on Social Media. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW '17)*. ACM, New York, NY, USA, 740–754. https://doi.org/10.1145/2998181.2998192

[19] Abigail Durrant, David Kirk, Diego Trujillo Pisanty, Wendy Moncur, Kathryn Orzech, Tom Schofield, Chris Elsden, David Chatting, and Andrew Monk. 2017. Transitions in Digital Personhood: Online Activity in Early Retirement. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. ACM, New York, NY, USA, 6398–6411. https://doi.org/10.1145/3025453.3025913

[20] Alex Gillespie. 2012. Position exchange: The social development of agency. *New Ideas in Psychology* 30, 1 (apr 2012), 32–46. https://doi.org/10.1016/j.newideapsych.2010.03.004

[21] Alex Gillespie and Jack Martin. 2014. Position Exchange Theory: A socio-material basis for discursive and psychological positioning. *New Ideas in Psychology* 32 (jan 2014), 73–79. https://doi.org/10.1016/j.newideapsych.2013.05.001

[22] Steve Howard, Jesper Kjeldskov, Mikael B Skov, Kasper Garnæs, and Olga Grünberger. 2006. Negotiating Presence-in-absence: Contact, Content and Context. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '06)*. ACM, New York, NY, USA, 909–912. https://doi.org/10.1145/1124772.1124906

[23] Euijin Hwang, Reuben Kirkham, Andrew Monk, and Patrick Olivier. 2018. Respectful Disconnection: Understanding Long Distance Family Relationships in a South Korean Context. In *Proceedings of the 2018 Designing Interactive Systems Conference (DIS '18)*. ACM, New York, NY, USA, 733–745. https://doi.org/10.1145/3196709.3196751

[24] Lilly Irani, Janet Vertesi, Paul Dourish, Kavita Philip, and Rebecca E Grinter. 2010. Postcolonial Computing: A Lens on Design and Development. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '10)*. ACM, New York, NY, USA, 1311–1320. https://doi.org/10.1145/1753326.1753522

[25] Lilly C Irani and Paul Dourish. 2009. Postcolonial Interculturality. In *Proceedings of the 2009 International Workshop on Intercultural Collaboration (IWIC '09)*. ACM, New York, NY, USA, 249–252. https://doi.org/10.1145/1499224.1499268

[26] Yoshihiro Itoh, Asami Miyajima, and Takumi Watanabe. 2002. 'TSUNAGARI' Communication: Fostering a Feeling of Connection Between Family Members. In *CHI '02 Extended Abstracts on Human Factors in Computing Systems (CHI EA '02)*. ACM, New York, NY, USA, 810–811. https://doi.org/10.1145/506443.506609

[27] Jasmine Jones and Mark S Ackerman. 2018. Co-constructing Family Memory: Understanding the Intergenerational Practices of Passing on Family Stories. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*. ACM, New York, NY, USA, 424:1—-424:13. https://doi.org/10.1145/3173574.3173998

[28] Dimitrios Kontaris, Daniel Harrison, Evgenia-Eleni Patsoule, Susan Zhuang, and Annabel Slade. 2012. Feelybean: Communicating Touch over Distance. In *CHI '12 Extended Abstracts on Human Factors in Computing Systems (CHI EA '12)*. ACM, New York, NY, USA, 1273–1278. https://doi.org/10.1145/2212776.2212439

[29] Eva Lenz, Marc Hassenzahl, Wasili Adamow, Patrick Beedgen, Kirstin Kohler, and Thies Schneider. 2016. Four Stories About Feeling Close Over A Distance. In *Proceedings of the TEI '16: Tenth International Conference on Tangible, Embedded, and Embodied Interaction (TEI '16)*. ACM, New York, NY, USA, 494–499. https://doi.org/10.1145/2839462.2856523

[30] Tuck Wah Leong and Toni Robertson. 2016. Voicing Values: Laying Foundations for Ageing People to Participate in Design. In *Proceedings of the 14th Participatory Design Conference: Full Papers - Volume 1 (PDC '16)*. ACM, New York, NY, USA, 31–40. https://doi.org/10.1145/2940299.2940301

[31] Siân Lindley and Jayne Wallace. 2015. Placing in Age: Transitioning to a New Home in Later Life. *ACM Trans. Comput.-Hum. Interact.* 22, 4 (2015), 1–39. https://doi.org/10.1145/2755562

[32] Siân E. Lindley, Richard Harper, and Abigail Sellen. 2008. Designing for Elders: Exploring the Complexity of Relationships in Later Life. In *Proceedings of the 22Nd British HCI Group Annual Conference on People and Computers: Culture, Creativity, Interaction - Volume 1 (BCS-HCI '08)*. British Computer Society, Swinton, UK, UK, 77–86. http://dl.acm.org/citation.cfm?id=1531514.1531525

[33] Siân E. Lindley, Richard Harper, and Abigail Sellen. 2009. Desiring to Be in Touch in a Changing Communications Landscape: Attitudes of Older Adults. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '09)*. ACM, New York, NY, USA, 1693–1702. https://doi.org/10.1145/1518701.1518962

[34] Kurt Luescher and Karl Pillemer. 1998. Intergenerational Ambivalence: A New Approach to the Study of Parent-Child Relations in Later Life. *Journal of Marriage and Family* 60, 2 (1998), 413–425. https://doi.org/10.2307/353858

[35] Tuuli Mattelmäki. 2008. Probing for co-exploring. *CoDesign* 4, 1 (mar 2008), 65–78. https://doi.org/10.1080/15710880701875027

[36] Asami Miyajima, Yoshihiro Itoh, Masako Itoh, and Takumi Watanabe. 2005. "Tsunagari-kan" Communication: Design of a New Telecommunication Environment and a Field Test with Family Members Living Apart. *International Journal of Human–Computer Interaction* 19, 2 (nov 2005), 253–276. https://doi.org/10.1207/s15327590ijhc1902_6

[37] Florian 'Floyd' Mueller, Shannon O'Brien, and Alex Thorogood. 2007. Jogging over a Distance: Supporting a "Jogging Together" Experience Although Being Apart. In *CHI '07 Extended Abstracts on Human Factors in Computing Systems (CHI EA '07)*. ACM, New York, NY, USA, 1989–1994. https://doi.org/10.1145/1240866.1240937

[38] Stephanie Neumann, Richard Banks, and Marian Dörk. 2017. Memory Dialogue: Exploring Artefact-Based Memory Sharing. In *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '17)*. ACM, New York, NY, USA, 884–895. https://doi.org/10.1145/3027063.3052756

[39] Carman Neustaedter and Saul Greenberg. 2012. Intimacy in Long-distance Relationships over Video Chat. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '12)*. ACM, New York, NY, USA, 753–762. https://doi.org/10.1145/2207676.2207785

[40] Carman Neustaedter, Tejinder K Judge, Steve Harrison, Abigail Sellen, Xiang Cao, David Kirk, and Joseph Kaye. 2010. Connecting Families: New Technologies, Family Communication, and the Impact on Domestic Space. In *Proceedings of the 16th ACM International Conference on Supporting Group Work (GROUP '10)*. ACM, New York, NY, USA, 363–366. https://doi.org/10.1145/1880071.1880152

[41] Midas Nouwens, Carla F Griggio, and Wendy E Mackay. 2017. "WhatsApp is for Family; Messenger is for Friends": Communication Places in App Ecosystems. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. ACM, New York, NY, USA, 727–735. https://doi.org/10.1145/3025453.3025484

[42] Marianna Obrist, Carlos Velasco, Chi Vi, Nimesha Ranasinghe, Ali Israr, Adrian Cheok, Charles Spence, and Ponnampalam Gopalakrishnakone. 2016. Sensing the Future of HCI: Touch, Taste, and Smell User Interfaces. *interactions* 23, 5 (aug 2016), 40–49. https://doi.org/10.1145/2973568

[43] Leysia Palen and Paul Dourish. 2003. Unpacking "Privacy" for a Networked World. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '03)*. ACM, New York, NY, USA, 129–136. https://doi.org/10.1145/642611.642635

[44] Thomas Nelson Publishers. 1992. *Webster's 21st Century Book of Quotations*. Thomas Nelson Incorporated. https://books.google.com.au/books?id=mIck8lhsD5sC

[45] Toni Robertson, Tuck W Leong, Jeannette Durick, and Treffyn Koreshoff. 2014. Mutual Learning As a Resource for Research Design. In *Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium Papers, and Keynote Abstracts - Volume 2 (PDC '14)*. ACM, New York, NY, USA, 25–28. https://doi.org/10.1145/2662155.2662181

[46] Toni Robertson and Jesper Simonsen. 2012. Participatory Design: an introduction. In *Routledge international handbook of participatory design*. Routledge, 21–38.

[47] Kimiko Ryokai, Elena Durán López, Noura Howell, Jon Gillick, and David Bamman. 2018. Capturing, Representing, and Interacting with Laughter. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*. ACM, New York, NY, USA, 358:1—-358:12. https://doi.org/10.1145/3173574.3173932

[48] Samarth Singhal, Carman Neustaedter, Yee Loong Ooi, Alissa N Antle, and Brendan Matkin. 2017. Flex-N-Feel: The Design and Evaluation of Emotive Gloves for Couples to Support Touch Over Distance. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW '17)*. ACM, New York, NY, USA, 98–110. https://doi.org/10.1145/2998181.2998247

[49] Alessandro Soro, Margot Brereton, Jennyfer Lawrence Taylor, Anita Lee Hong, and Paul Roe. 2016. Cross-Cultural Dialogical Probes. In *Proceedings of the First African Conference on Human Computer Interaction (AfriCHI'16)*. ACM, New York, NY, USA, 114–125. https://doi.org/10.1145/2998581.2998591

[50] Joshua Tanenbaum. 2014. Design Fictional Interactions: Why HCI Should Care About Stories. *interactions* 21, 5 (sep 2014), 22–23. https://doi.org/10.1145/2648414

[51] Frank Vetere, Hilary Davis, Martin Gibbs, and Steve Howard. 2009. The Magic Box and Collage: Responding to the challenge of distributed intergenerational play. *International Journal of Human-Computer Studies* 67, 2 (2009), 165–178. https://doi.org/10.1016/j.ijhcs.2008.09.004

[52] Frank Vetere, Martin R Gibbs, Jesper Kjeldskov, Steve Howard, Florian 'Floyd' Mueller, Sonja Pedell, Karen Mecoles, and Marcus Bunyan. 2005. Mediating Intimacy: Designing Technologies to Support Strong-tie Relationships. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '05)*. ACM, New York, NY, USA, 471–480. https://doi.org/10.1145/1054972.1055038

[53] Thomas V Visser, Martijn H Vastenburg, and David V Keyson. 2011. Designing to Support Social Connectedness: The Case of SnowGlobe. *International Journal of Design* 5, 3 (dec 2011). http://ijdesign.org/index.php/IJDesign/article/view/710

[54] Peter Wright and John McCarthy. 2008. Empathy and Experience in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '08)*. ACM, New York, NY, USA, 637–646. https://doi.org/10.1145/1357054.1357156

[55] Peter Wright and John McCarthy. 2010. Experience-Centered Design: Designers, Users, and Communities in Dialogue. *Synthesis Lectures on Human-Centered Informatics* 3, 1 (2010), 1–123. https://doi.org/10.2200/S00229ED1V01Y201003HCI009

[56] Samantha Yglesias, Deborah Tatar, Steve Harrison, and Joon Suk Lee. 2016. Balancing Behaviors: Design-Relevant Phenomena in Couples' Argumentation via Different Media. In *Emotions, Technology, and Behaviors*, Sharon Y Tettegah and Dorothy L Espelage (Eds.). Academic Press, San Diego, 123–142. https://doi.org/10.1016/B978-0-12-801873-6.00007-8

[57] Rui Zhou, Zhonghe Wen, Muchao Tang, and Betsy DiSalvo. 2017. Navigating Media Use: Chinese Parents and Their Overseas Adolescent Children on WeChat. In *Proceedings of the 2017 Conference on Designing Interactive Systems (DIS '17)*. ACM, New York, NY, USA, 1025–1037. https://doi.org/10.1145/3064663.3064701