

Bespoke Booklets: A Method for Situated Co-Speculation

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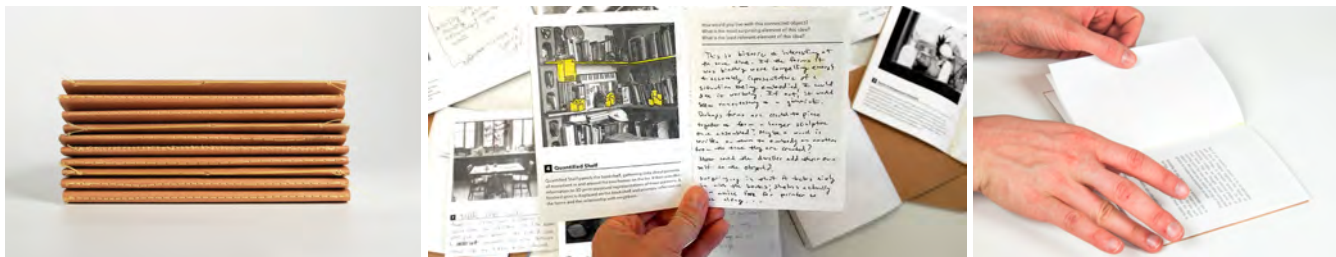


Figure 1. Covers and bindings; Collection of Bespoke Booklets; Introductory page.

ABSTRACT

We present *Bespoke Booklets*: a design research method utilizing booklets of situated, imaginary, and personalized conceptual sketches to co-speculatively envision alternative futures (in our case for domestic Internet of Things). The Bespoke Booklets create a space where designers and participants can co-imagine alternative futures while also engaging each other at the level of embodied experiences. After refining our method, we discovered it had many qualities previously championed by feminist HCI and STS theorists. To this end, we draw out, analyze, and critique our method using feminist concepts as a lens to emphasize four specific qualities: collaborative, post-functional, situated, and partial. We found that the booklets, as material artifacts, were a productive tool to generate a physical record of our co-speculation and a fruitful catalyst for research that reflects feminist theory, offering an example of how it can be used as a heuristic for design methodologies.

Author Keywords

Design methods; booklet; home; co-speculation; feminist HCI; feminist theory.

INTRODUCTION

As design and human-computer interaction (HCI) tackle larger-scale systemic challenges and address the accelerating integration of technologies into everyday life, new methods are being developed which seek diverse, critical and generative ways of materializing ideas and visions around possible futures. Speculative design [1,19], future studies [11], and research-through-design [26,61], as well as techniques like futuring, forecasting, and extrapolation offer a variety of tactics for envisioning and communicating (e.g.

[5,20,38,53]). Forming future visions can help uncover insights at two levels: 1) the creative process itself can be the source of novel ideas and more precise visions, and 2) when shared with potential users and stakeholders, those refined visions can lead to generative discussions and debates.

In this paper, we contribute to this growing field by offering *Bespoke Booklets*: a design research method where we use booklets to co-speculate and envision through situated, fictional, and personalized conceptual sketches. In brief, the Bespoke Booklets are co-created, handmade booklets including photos of participants' homes with sketched design concepts overlaid (Fig. 1).

The Bespoke Booklets method responds to contemporary discussions in speculative design and futures studies along two axes. The first axis draws a continuum between individual authorial voices and collaborative or co-creative approaches to the making of future visions. Individual voices are often seen in design fiction films or scenario writing [5], whereas a collaborative approach has roots in co-design and participatory design. In an attempt to engage communities in a co-imagining practice which is inclusive, bottom-up, and multidimensional, the Bespoke Booklets purposefully carve out space and time for a generative conversation about alternative futures between designers and participants.

The second axis outlines a continuum between abstract visions and situated engagements with potential futures. Design scholars and futurists Candy and Dunagan have argued that “we must bridge the *experiential gulf* between inherently abstract notions of possible futures, and life as it is apprehended, felt, embedded and embodied in the present and on the ground” [12:137]. Abstract visions often require more imagination for what futures would be (e.g. in science fiction or design fiction films), while embodied engagements rely on bodily and sensory experiences to showcase what a future might be (e.g. in speculative enactments [20] or material speculation [53]). As we will argue, the Bespoke Booklets position the creation and reflection of future

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DIS'19, June 24–28, 2019, San Diego, CA, USA.

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ACM ISBN 978-1-4503-5850-7/19/06...\$15.00.

DOI: <http://dx.doi.org/10.1145/3322276.3322311>

concepts closer to situated futures practices by being directly positioned in participant's homes, allowing for a more experiential engagement. The booklets also serve to communicate the knowledge and experiences of researcher and participant [24]: they guided us towards the more concrete and situated knowledge of our co-speculators while simultaneously guiding participants towards a more abstract engagement with possible futures.

The core of this paper is our analysis of how the Bespoke Booklets respond to the research question *How does the method of Bespoke Booklets support situated co-speculation?* Although we arrived at this method organically through refining our booklets based on reflections from an initial workshop, we soon discovered affinities between our revised method and feminist HCI and STS theory. Feminist concepts (e.g. [2,3,30,50]) allowed us to more deeply understand how our method is collaborative, post-functional, situated, and partial. In addition, this feminist analytical lens provoked a generative critique and reflection about the method: highlighting how the method could have been made more plural for the participants. This led to a second research question: *In what ways can a feminist analytical lens help reflect on the Bespoke Booklets method?* As a result, our contributions are two-fold. First, we offer a detailed description of the Bespoke Booklets method as a case of co-speculation and experiential engagement with futures. Second, with a feminist analytical lens, we position four qualities of the booklets: collaborative, post-functional, situated, and partial, as critical factors worthy of heightened consideration in HCI research and speculative design. Finally, our use of a feminist lens to reflect on a design method sets an example of how critical theory can be incorporated into the design process as a type of methodological heuristic.

CONTEXTUAL BACKGROUND: PILOT WORK

The Bespoke Booklet method was developed during a speculative exploration of potential visions for IoT devices in non-stereotypical homes [15]. The goal of this work was to challenge prevailing views of IoT by looking at a diversity of home contexts and formats. Such diversity of homes opens up definitions of 'the home' where permanence and immobility are expected, where social configurations exclude non-family dynamics, and where size and configuration are standardized. Our work is part of a broader trend in HCI research which seeks to explore a variety of homes and living situations (e.g. [13,34,39,40,57,58,60]) in order to reimagine what smart and connected homes might become. This work challenges HCI researchers and practitioners to design technologies for the home with more precision around 'whose home' and 'what home' is at the center of their work.

Pilot work: Typified Booklet of proposals

Before we outline the refined version of our method, we briefly share the iterative process that led us there and the lessons learned along the way. In our first attempt to design IoT devices for non-stereotypical homes we created a series of ideas for a variety of home types (including a cabin, a

retirement home, a multigenerational home, a hotel room, and more) with inspiration drawn from secondary sources (photographs, etc.). Our team (comprised of two undergraduate students in interaction design, one in industrial design, four master of design students, and one professor of interaction design) generated concepts that would accentuate specific qualities of these non-stereotypical homes, creating 13 finalized concepts in total. We aimed for simplicity and readability in the sketches and short descriptions, and embraced principles like humor and surprise in the concepts. We assembled the concepts into booklets where each spread featured the concept and description on the left page and a blank page on the right for feedback (Fig. 2).



Figure 2. Spread of the Typified Booklets.

To gather feedback about these concepts, we organized a workshop with five participants (including two design students, a computer science student interested in IoT, a musician, and a hotel manager). Participants received a booklet one week before the workshop and were invited to write or sketch ideas and reflections they had in relation to the concepts. During the two-hour long workshop, we directed a discussion around the fitness of the concepts to the homes we had selected, and how these specific homes and concepts might extend beyond idealized views of the home.

Lessons learned from the Typified Booklet

While our pilot work confirmed the value of using a booklet (including details such as its size, the level of fidelity of the sketches, and our material choices), and the value of using humor and critique in our concepts, it also revealed two main deficiencies.

First, few designers or participants had experience living in the types of homes the concepts were designed for (cabin, retirement home, hotel, etc.). While participants could react to the concepts we put together, their reflections were too often built on an imagined life in those homes. Second, the workshop format was not very conducive to understanding participants' own ideas of future bespoke IoT. While participants were encouraged to share ideas in the booklet and at the workshop, a lack of specific experience resulted in many opting out of that part of the study.

As a result, we decided to situate concepts within participants' individual homes rather than generic 'types of homes' in an attempt to avoid abstract archetypes. In addition, it also became clear that we needed to establish a protocol that supported a collaborative effort with the participants, to open space for participants' voices. These lessons informed our revision of the booklets as bespoke to individuals, and of our commitment to more embodied co-speculations with participants.

METHODOLOGICAL FOUNDATIONS

As we revised our method, we borrowed from traditions of co-speculation, experiential speculation, booklets, and sketching which we briefly review below.

Co-speculation

Co-speculation is a collaborative method within speculative design practices. Speculative design aims at creating near-futures based on natural extrapolations of existing technologies, or alternative presents built out of 'what-if' thought experiments which re-imagine the present within alternative histories [1]. Design researcher James Auger argues the benefit of speculation is that it decouples design from industry, leaving the designer free to respond to questions and discourse, and ultimately allow for increased agency towards considerations about the future. However, DiSalvo [17] argues that speculative design at times fails to address the political aspect of social contexts and to offer scaffolds that lead to action. Furthermore, while de-coupling from industry and asking critical questions of the future is desirable, critiques (e.g. [11]) of top-down, authorial or abstracted speculation point to the need for more collaborative approaches to speculation.

In response, co-speculation contributes to speculative practice by creating alternate presents and near-futures, but in ways that incorporate non-design experts. According to Wakkary et al., "*co-speculation is the recruiting and participation of study participants who are well positioned to actively and knowingly speculate with us in our inquiry in ways that we cannot alone*" [55:94]. Current examples of co-speculation include co-speculation with philosophers [55], with civics scholars [18] and with HCI experts about autonomous connected devices in the home [32,54].

Through a co-speculative approach, the Bespoke Booklets become a tool for non-hierarchical exploration. Although our work stays within the realm of the imagination, we maintain attitudes shared by co-creation—often understood as collective acts of creativity [45]. The research team works alongside participants to develop ideas, question assumptions, and establish possible paths forward.

Experiential speculation

In addition to revisiting who speculates (designer and layperson), futures and design scholars have also started to articulate the need for a less abstract and more experiential relation to speculation in order to create more diverse, nuanced, innovative and rigorous explorations of potential futures [11]. According to Candy and Dunagan, experiential speculation is essentially "*exploiting the continuum of*

human experience, the full array of sensory and semiotic vectors, in order to enable a different and deeper engagement in thought and discussion about one or more futures" [12:137]. The authors argue that speculations are often encountered at an intellectual level, and that we need to strategize differently to engage people at more visceral levels such as emotional, physical, or sensorial levels.

Inspired by this work, we explore how the Bespoke Booklets can also provoke experiential encounters with visions of the future. Our method relies on the histories of co-speculators in their homes, grounding research in specific embodied knowledge to guide speculation into their spaces.

Booklets as method

Booklets as research artifacts are currently finding purchase in the design community as an accessible way of communicating and sharing design research. For example, annotated design portfolios [9] group designs thematically in order to comment on lineages of thought and theory. Similarly, design workbooks [25] are collections of low to medium fidelity design proposals typically shared amongst designers in the inception phase of design. Workbooks can also be used as a tool for critical, participatory speculation as in Blythe et al.'s [7] workshop about future domestic technologies.

The booklet format has also been adapted to create investigative probes. Probes (e.g. [8,27,33]) are frequently used as a bridge between designer and participant to enable alternative modes of discovery in design research practices. Design researchers create material artifacts and instructions (e.g. booklets, list of photos to take, post cards, etc.) that participants can complete, and reflect on over a period of time. For example, Fox's 'Catalog of Partial Things', is a booklet containing ideas and proposals "*ranging from policy to product to infrastructural intervention*" [23:119]. The intention was to use the booklet as a way to continue the dialogue with participants after the workshop. Pierce et al. used zines to make the content of seldom-read privacy policies more digestible [41]. Zines, as alternative modes of knowledge transmission, have proven to be a relevant way of conveying and sharing research with interlocutors (e.g. [24]).

Sketching as method

The Bespoke Booklets rely on sketching as one of the main modes of engaging with ideas. Sketching is an established way of thinking through situations and generating new responses. According to Goldschmidt, sketching creates a dialectic between "*'seeing as' and 'seeing that'*" [28:131]: through the act of sketching, one can both see the visual representation of their ideas (seeing as) while also viewing the abstract concepts represented by the sketch (seeing that). This back and forth is also described by Schön as "*the situation's back-talk*" [46:79]: every time a new element is drawn, the situation has changed, offering the drawer a new space for thinking. Buxton [10] claims sketching is central to design as a way of externalizing thinking and as a strategy for fast and iterative problem-solving. He emphasizes the value of ambiguity in sketching, allowing sketches to be evocative and open to interpretation. Suwa and Tversky

further articulate how designers rarely sketch ideas that are clear, rather “they draw sketches to try out ideas, usually vague and uncertain ones” [51:342]. Openness, ambiguity, and interpretation make sketching an interesting method for conducting research as it opens a more flexible space for exchanges between researcher and participant. Design researchers have used sketching as a tool for communication between designers and non-designers [14,31] and in some cases with children [16,35,59].

In summary, the Bespoke Booklet method is embedded in a history of speculative design, more specifically in line with co-speculation as well as situated and experiential speculation. The method borrows its structured yet open-ended approach from probes, sketching, design workbooks, and zines to allow for private reflection and collaborative idea generation.

OUR METHOD: BESPOKE BOOKLETS

In this section, we describe in detail our method called Bespoke Booklets. The Bespoke Booklets are constituted of 10 to 12 situated, imaginary, and personally tailored conceptual sketches designed specifically for and with dwellers of non-stereotypical homes. We use the term bespoken to mean that each booklet was conceptualized and made specifically for one participant. As articulated above, the goal of the booklets was to deconstruct the archetype of the home by using diverse homes as the starting point for a multitude of domestic IoT futures.

0- Recruitment

We conducted two rounds of Bespoke Booklets. In the first round, we recruited eight people from our personal networks who lived in non-stereotypical homes. That round allowed us to test and slightly adjust this new approach (e.g. giving participants the opportunity to take their own photos during their home tour). In the second round, we recruited specifically outside our personal networks and used Craigslist as well as broad University lists. In the second round we assembled a group of eight participants that covered a broader range of homes. Together the two rounds offered diversity in participants’ educational background, occupation, and age. We connected via email to begin a dialogue aimed at better understanding the participants and their homes as well as to communicate our goals, agenda, timeline, and to answer questions or address concerns. After this dialogue, we set up a time to meet at the participants’ home. Participants were offered a \$25 gift card for their participation.

1- Home tour

Two design researchers visited each participant’s home. During the visit, we asked questions about the history of the home, domestic habits and routines, and surprising or unique elements about the home. We took photos of the home, capturing overviews, architectural elements, and artifacts that represented important aspects of participants’ lives. The researchers took most of the photos, however, towards the end of the visit we invited participants to take photos themselves to be included in the construction of the booklet. With our intention to co-speculate, this afforded participants an opportunity to further root speculations.

2- Sketches and booklet making

After the home tour, we returned to the studio, discussed what was observed in weekly meetings and identified unique characteristics for each home based on the home tour data. We used these characteristics as points of departure for imaginary IoT concepts that would be hand sketched, scanned, and then digitally overlaid on top of black and white photos taken of the homes. Our concepts were not focused on utilitarian solutions for the homes. Rather, they were humorous, critical, or delightful, and they were always positioned in the home visited and concerned with reflecting the specific nature of the home in question.

We made the booklets with the same size, paper, cover, and thread as the Typified Booklets. The booklets were composed of two sections. The first included 5-6 concepts imagined by our design team, one concept per spread, with a white page for focused comments on the right (Fig. 3). The second section was comprised of 5-6 ‘blank’ photos (photos without a sketch (Fig. 3)) where we invited participants to draw their own concepts *into* their homes. We left a white page on the right of each photo for a description of each concept.

3- Deploying the booklet

We gave the booklets to our participants and asked them to take some time (about 1-4 weeks) to reflect on the concepts designed for their homes and to come up with 5-6 ideas for other IoT devices that could exist in their homes. We asked them to sketch and comment directly in the booklet.

4- Exit interview: getting the books back

Semi-structured interviews initially focused on the booklet’s content, then broadened to questions about relationships with the home, the nature of the home, and finally thoughts about the method Bespoke Booklets itself.



Figure 3. Studio concept before participant’s reactions; studio concept with participant’s reactions; participant’s concept.

EXAMINING THE BESPOKE BOOKLETS

Analytical lens: Feminist concepts

We shifted our method from Typified Booklets to Bespoke Booklets in an attempt to have more situated co-speculations with participants. As we stated in the introduction, during our use of and initial reflection on the method, we noticed how the choices we made in crafting and deploying our booklets echoed feminist concepts such as participation [3,22,36], post-functionality [6,44], situatedness [30,50], and partiality [23,30]. In hindsight, our research agenda itself had a feminist perspective: it aimed at offering plural (not singular) and contingent (not universal) visions of the home, and at including the often-forgotten voices of a diversity of home dwellers in speculations about the future of IoT. It is thus unsurprising that the method we developed for this purpose aligned well with feminist concepts. We found feminist theorizing an inspirational approach to bring clarity to our analysis, and, as we will develop in the discussion, we found it to be a productive way to critique our method and reflect on how it could improve in future iterations. Furthermore, we draw inspiration from the ‘Catalogue of Partial Things’ [23], both for its format and how it engages feminist concepts and from Wong-Villacres et al. [56] who chose a feminist lens (specifically intersectionality) as a way to research opportunities for learning technologies in an Indian culture. We also draw from a growing discussion around feminist theory in HCI (e.g. [2,3,21,43,44,49]). As we unravel and explore each quality below, we start with providing analytical grounds before discussing how that quality emerged in our design rationale for making the Bespoke Booklets and presenting how participants experienced that quality.

Collaborative: Establishing mechanisms for co-speculation

The collaborative quality of the Bespoke Booklets refers to how the method purposefully builds space for participation both through back and forth exchanges with the booklet and in the co-speculative orientation of the exit interview.

Analytical ground

Feminist scholars have articulated the need to go beyond individualized perspectives and ways of designing, to instead value communal, collaborative, and collective design practices that cross expertise levels and interests [22,36,44]. In Bardzell’s [2] feminist HCI agenda, a participatory quality goes further than to just inform understanding (a standard goal among HCI practitioners) but to form concepts together, similarly to participatory design practices. In acknowledging that “*knowers are not substitutable for one another*” [2:1306], an exchange, or ‘alliance’ as Rosner [44] calls it, between researcher and participant is vital. To fully embrace this ideal means to establish research methods that creates a context able to encourage the surfacing of knowledges from many, all who are engaged in co-speculation. The value of participant knowledge is expressed further in Elsdén et al.’s work on speculative enactments: participants’ knowledge is not just a resource that can be mined, but instead should be invited “*to be in on the co-construct of fiction*” [20:5392].

Design rationale

The Bespoke Booklets enabled both active and passive forms of collaboration through a back and forth exchange of the booklet between researchers and participants. We aimed to build a rhythm between the actively communal moments of discussion (home tour and exit interview), our studio’s creative acts (choosing photos, sketching the first concepts), participants’ contemplative personal moments (receiving the booklet), reactive acts (filling the booklet’s first half), and active moments of reflection and creation (filling the booklet’s second half). This back and forth opened moments for each actor to leave marks, together building a patchwork of interventions in the booklets themselves.

We sought to establish participatory mechanisms in our method through the careful visual and material construction of the Bespoke Booklets. We chose the photos that would best support sketching: by looking at the space or artifacts they represented, but also by evaluating the visual quality of the photo and of white spaces that would allow easy sketching. We hoped the photos would help break the fear of the blank page, and we purposefully gave participants time on their own to reflect and imagine. In addition, the design decisions behind the Bespoke Booklets’ format (pocket sized) and material choices (everyday card stock and paper) were directed towards the creation of an artifact that would actively invite participation. We wanted our booklets to convey to participants our enthusiasm to work with them in a way that showed care but didn’t feel too precious to handle or draw in.

Participants’ insights

Our attention to materiality was noticed. Kate (participants’ names are pseudonyms) commented on how the booklet, its material makeup, construction and level of fidelity, supported further participation: “*the intentionality of the booklet and the binding... it made it feel considered ... and it’s not too precious enough that I wouldn’t want to get feedback on them or it feels like the right fidelity for this.*”

When choosing to create a physical booklet to contain the proposals we hoped it would travel with participants, be touched and manipulated. Charles reflects, “[you could have used] a google form. It’s probably more efficient and robust. They’re less prone to decay and being damaged, but like look, you guys can tell I handled that book a little bit. It got bent by my hands. I was able to write in it, so I marked it. I drew it, I carried it with me. It had more to me, felt much more human and decayed and scratched.”

Participation also happened through collaborative acts in the booklet. For instance, some participants mentioned how our sketches had inspired their own speculations. For example, participant June designed a concept that would build on and follow a concept proposed by the studio. The studio proposed a film projector that shared films from the 1930’s (when June’s apartment was still a cinema box office). June pushed the idea further by imagining that a holographic character would also appear during the projections. Participants were also free to rebut the suggestion that the area photographed needed anything new at all. Participant Susan pushed back

against making any changes to her living room, writing “*Peaceful as it is.*” Similarly, Grace’s response to the photo we provided of her trawler’s steering wheel was that “*I guess this one’s hard because it’s perfectly functional. I like it.*”¹

Finally, while much of the co-creation happened asynchronously as we passed the booklets back and forth, collaborative co-speculation culminated during the exit interviews. The Bespoke Booklets primed the participants to co-speculate with us and generate more ideas for connected objects. For example, Daphne’s design of a smart closet that deposited her shoes near her door changed through the exit interview eventually becoming a smart but selfish closet that tracked and influenced her expenses, advocating for new and more exciting clothes and shoes.

Seeking knowledge and participation from many viewpoints and co-creating with participants is an essential part of feminist theory, as well as an established design tradition, and something we sought to honor with the Bespoke Booklets. The booklet was the material link which persisted through all phases of active and passive participation and served as an invitation to imagine together.

Post-functional: a foundation for imagining

The post-functional quality of the Bespoke Booklets shifts focus away from the commercial usefulness of an artifact, allowing its other qualities to come to light and freeing the imagination to engage in more personal and adventurous visions of alternative futures.

Analytical Ground

Post-functionality can be seen as a feminist critique of solutionism: an emphasis on the solution often eclipses the need to understand and fully articulate a problem [6,44]. HCI researchers have developed a variety of techniques relying on silly or absurd representations to provoke a better understanding of issues rather than finding solutions to them (e.g. [6,37,42,47,52]). Blythe et al. propose that this provocative reframing of “*representation is crucial to how we imagine future technologies*” [6:1]. We argue that post-functional proposals, by focusing on qualities other than functionality, also aim at exploring and framing issues rather than offering universal solutions.

In addition to being post-functional, the Bespoke Booklets are also tools for defamiliarization [4]. Defamiliarizing participants’ homes was necessary because “*as perception becomes habitual, it becomes automatic. Thus, for example, all of our habits retreat into the area of the unconsciously automatic*” [48:6]. The Bespoke Booklets help participants step back and gain a fresh perspective on their homes by juxtaposing these silly, post-functional designs on top of the pictures of their homes.

Design rationale

Filling the first half of the booklet with post-functional and improbable concepts exemplified concrete ways to imagine domestic IoT beyond the current solutionist narrative of IoT

technology. Orienting ideation towards post-functional IoT opened up possibilities for highlighting unique qualities of each participants’ homes which we saw as personal, interesting, and non-stereotypical. For example, participant Penelope lives in a 198ft² apartment. She uses the ‘kitchen’ sink and cupboard during her morning routine because her bathroom has neither. When describing that area of her home she would unconsciously shift between calling it her kitchen and bathroom. With this unique multi-use characteristic of the space in mind, we imagined the ‘Competing Cupboard’: a cupboard where the dishes and cleaning supplies compete with the toothpaste and makeup remover for odorous dominance over the storage space. This concept was a playful representation of the need to overlap functions in a home where space is severely limited. Unburdened by the need to *solve* Penelope’s lack of space, we engaged in a more multifaceted exploration of her home, playing with elements of shared agency.

Participants’ insights

While some participants were at times more functionally oriented, others embraced the curious nature of the Bespoke Booklets. Oscar remarked: “*I really took to heart the light, fun, silly and unexpected.*” Many participants used a post-functional design strategy to push their imagination towards concepts that were truly related to qualities of their homes.

The particular layout of Kate’s apartment makes lighting a challenge in her kitchen. Kate used this to explore how to create a playful ambiance with her concept ‘Serenading Light Switch’. When Kate turned the light off, it would start to serenade her, “*it’s almost like it’s a little romantic -- if it’s off and like you have to light the candles in there.*” Similarly, the focus of this speculation is not the potential usefulness of future technologies, but what technology’s role might be in making Kate’s home *feel* more engaging. How this is technically achieved is inconsequential in a post-functional framework and therefore frees up the imagination to engage in more open-ended speculation.

When reacting to the studio’s speculations, participants were often surprised by their lack of practicality at first; Karl’s initial reaction when looking over the studio’s concepts was somewhat confused “*Yeah, like the purpose you were giving things... there wasn’t a lot of purpose.*” But the concepts’ strangeness catalyzed a conversation about what other values one might include in domestic technologies, opening up space for things like humor, playfulness, surprise, and needlessness. While discussing the studio concept ‘Shrimp Experience’ Karl delightedly expressed that “*it would be hilariously irrelevant to my life.*” The post-functionality of the original concept allowed Karl to speculate on and appreciate a novel interaction with technology in the home he had not previously considered even if it didn’t add much to his life.

¹ A high resolution version of each concept photo and sketch can be found as a supplementary materials file.

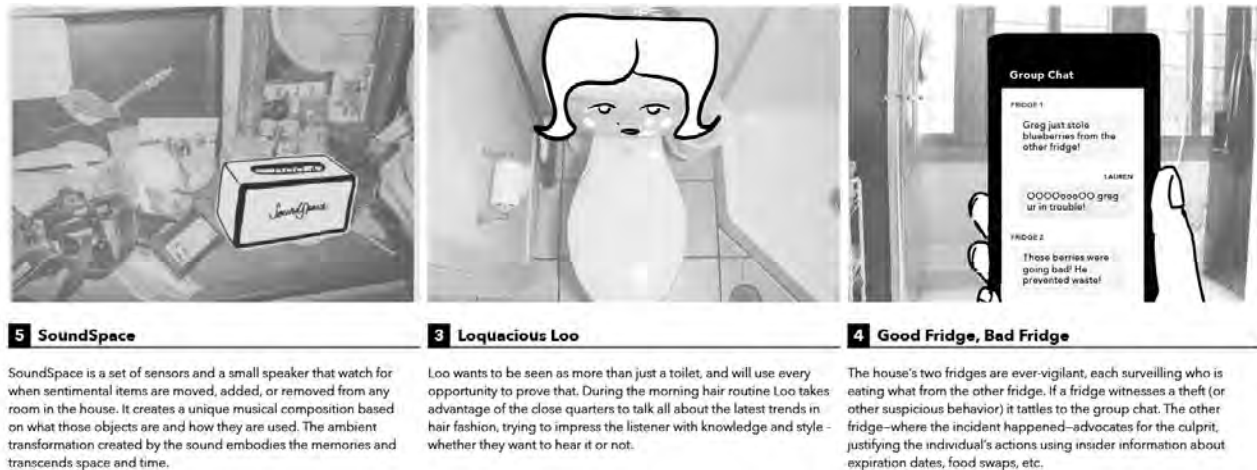


Figure 4. Excerpts from the Bespoke Booklets: SoundSpace, Loquacious Loo, and Good Fridge, Bad Fridge

Participant Oscar always considered his partner Lindsey's collection of sentimental rocks and shells a static and valueless assemblage in their small apartment. However, when discussing the studio concept 'SoundScape' (Fig. 4), an object that creates and plays ambient music from data gathered about one's knickknacks, Oscar began to imagine what new value and meaning might be afforded through this fanciful interaction: *"I think it would make the objects seem more alive...with a personality that changed overtime and so I could relate back to that change in personality...I could have this whole relationship with it, that I wouldn't normally have with one thing that stays the same all the time."* By introducing an unexpected and curious interaction, SoundScape brought renewed attention to—in other words, it defamiliarized—the static and valueless knickknacks in Oscar's apartment, shifting Oscar's many preconceived ideas on what was significant, and worthwhile. The Bespoke Booklet opened space to challenge those assumptions and imagine exciting relationships with future IoT devices.

Post-functionality, by removing common barriers like how things work or what problem they solve, opened a productive space for the creation of imaginative concepts that explore alternative views of IoT. The silly and absurd quality of the proposals (both ours and the participants') helped defamiliarize common assumptions about the home and IoT and supported the elaboration of more personal and situated views of future IoT.

Situated: Layering sketches into people's homes

The Bespoke Booklets quality of situatedness relies on creating bespoke concepts sketched exclusively for (and within) each participant's home.

Analytical Ground

Feminist theorists have long been concerned with articulating how human knowledge is never decontextualized or abstracted but is always situated and embodied. In her work on human action, Suchman [50] expresses how human agency is inextricably tied to the specific sociomaterial arrangements we are part of. As a result, human knowledge is learned, applied, and understood

in situ. In relation to the abstract-embodied continuum discussed in the introduction, the feminist construct of situatedness is pointing towards a more embodied, specific, and less abstract approach to engaging with visions of the future. Furthermore, Haraway argues against unlocatable and disembodied knowledge, warning against visions *"from everywhere and so nowhere"* [30:590]. The situatedness of knowledge also relates to a personal and embodied way of seeing: competent 'seeing' encompasses complex, multisensory embodiments not available to anyone outside the lived experience of an individual [29]. Situated ways of seeing, according to Haraway, naturally exclude other points of view, and therefore must account for that limitation through seeking new technologies for seeing, stating: *"vision requires instruments of vision; an optics is a politics of positioning"* [30:586]. Rather than assume the conditions of a 'home,' our method strove to seek out situated accounts of living and domesticity by relying on the physicality of each home and the participants' embodied knowledge of their experience in that space.

Design rationale: Studio Decisions

In the Bespoke Booklets method, the conceptual sketches are physically situated onto the black and white photographs of real participants' homes. While the line drawn concepts from the Typified Booklets were related to a type of home, they still displayed a quality of being 'nowhere and anywhere': a design for a cabin did not specify what cabin, where it was located, its size, its layout, who lived in it, etc. Instead, in the refined Bespoke Booklets method, the sketches overlaid onto participants' home photos are definitely 'somewhere'.

For instance, we compare two concepts addressing a similar topic: connected devices communicating with each other in a form undecipherable to humans. In the Typified Booklet, we designed the 'Connected Coffee Pot' for an imagined recreational vehicle (RV). Coffee pots in different RVs would communicate with each other when they crossed paths on the road or in campgrounds, highlighting the mobile quality of RVs. Conversely, in his Bespoke Booklet, 'Gabbing Gardens' was designed for Charles' carriage house located behind his landlord's home. The concept is a pair of

connected garden ornaments which also communicate by means unintelligible to humans. Here, ‘Gabbing Gardens’ served to open a discussion on the tension between the landlord’s tidy and systematic approach to gardening and Charles’ more artistic, organic, and intuitive gardening style. While the ‘Connected Coffee Pot’ oriented discussions towards general concerns and comments around the unknowable life of connected devices, ‘Gabbing Gardens’ constrained reflections and discussion to Charles’ current relationship to his specific garden and landlord, and the role connected devices might play in this specific situation.

One way we adhered to the situatedness of the method was through a careful attention to the photos we took during the initial home tours. We took photos of assemblages of meaning, areas of neglect, items of utility and beauty, the neighborhood and surrounding spaces, etc, knowing that these photos would later serve as the physical platforms to overlay sketches on top of. When photographing we also considered the impact of perspective, if an area or object was typically viewed while seated we would sit and take the photograph. The caution we took while photographing each space is central to how our method generated situated concepts. Not only did the photographs help us get oriented to our participants and their space, they also ensured a currently situated platform for all the designs.

Overlaying sketches on top of photographs also proved to be an embodied way of thinking about the homes and the IoT concepts, allowing us to tacitly recall nuances of the spaces discovered through the initial home tours. This enabled us to create some unique and personal concepts and to avoid designing from stereotypes or assumptions. For example, participant Susan, an empty-nester, lives on a houseboat where many built-in features create one-of-a-kind living spaces. We designed ‘The Reading Troll’ for her home which creatively stores literary memories and occasionally recites snippets of her children’s favorite childhood books. The troll lives in one of the many hidden nooks and crannies of Susan’s home, making this concept respond both to her home but also to a very personal aspect of her past and present life. In addition, giving participants an opportunity to sketch on top of images afforded them a situated and embodied thinking process when creating concepts. The Bespoke Booklets open space for participants to equally materialize, store, communicate, and work through ideas.

Participants’ Insights

The Bespoke Booklets’ situatedness enabled personal and meaningful co-speculations and engendered embodied responses from participants. For example, participant Karey admitted that imagining new smart home devices was an abstract and challenging task. However, she also remarked that situating her reflection into her own home, on top of photographs helped narrow and focus her engagement.

Similarly, when discussing her approach to designing concepts for the book, participant Daphne recalls “*I could visually see it in my head. I’m not the best like sketcher, but I think visually I could see it.*” For Daphne, when she sketched on top of the blank photos we took of her space, she

was able to start rendering the ideas in her mind. Both Karey and Daphne recognized the benefit of situating ideas in concrete places in their homes as a way to frame and materialize their explorations. Furthermore, Karey remarked that the ‘constraints’ we provided helped her “*come up with big ideas and then...distill them into, like, what is valuable and what isn’t.*” By positioning the abstract prompt to imagine new IoT concepts in her own environment Karey was able to imagine what felt like “big ideas” that also mattered to her everyday experience.

Lastly, by situating the Bespoke Booklets in individual spaces, and explicitly asking the dwellers of those spaces to read, touch, write in, and play with the booklets, participants could better envision, and tactilely respond to the ideas within. For instance, Penelope explained how she played out (bodystormed) a fictional dialogue between her and her toilet to see what it would feel like to engage with the studio concept ‘Loquacious Loo’ (Fig. 4).

To conclude, the quality of situatedness in the Bespoke Booklets method resides in the choice to work as co-speculators with people living in non-stereotypical homes and in producing booklets that include particular photographs of their homes as the support for speculation. Positioning sketches atop those photos allowed both us and the participants to generate new ideas about IoT that avoided stereotypes and assumptions, and instead were rooted in concrete everyday practices around the homes we studied.

Partial: Voicing personal perspectives

Together, the Bespoke Booklets present a variety of personal perspectives about futures in IoT: each partial view co-exists next to other partial views, each as relevant and valid.

Analytical ground

Feminist theorists often share an understanding that multiple unique (situated) perspectives co-exist and constitute the world. Haraway argues that perspectives or visions are also always unfinished, open, and partial: “*there are only highly specific visual possibilities, each with a wonderfully detailed, active, partial way of organizing worlds*” [30:583]. Haraway claims that specificity and partiality are a response to the current paradigm of universalistic objectivism, that “*only partial perspective promises objective vision*” [30:583]. Each Bespoke Booklet offers 10-12 partial concepts of domestic technologies: they are personal, contingent and rooted in one specific home. Finally, the quality of partiality helps shift from a disembodied distant eye to many eyes, all with equally valid perspectives.

Design Rationale

We purposefully designed the Bespoke Booklets to become a support for partial perspectives. By giving one unique booklet to each participant, we set the scene for highly diverse responses, and for co-speculations that stem from unique points of view. As a result, not all design ideas fit all of the different non-stereotypical homes. For example, we imagined the ‘Salmon Telephone’ for Grace, a young woman who lived on a boat. The Salmon Telephone consists of trained salmon who eat and deliver partially garbled

messages between different marinas. This speculative concept would have little use in a non-nautical home. Similarly, ‘Good Fridge, Bad Fridge’ (Fig. 4), a design for a large shared home with two refrigerators who tattle on food thieves in the household group chat, would never work in a small studio or van where there is barely room for a fridge at all. However, the partiality of these designs helped us explore concepts often overlooked when thinking of idealized homes. We value the diversity, and often contradictory, proposals that emerged from our approach.

Participants’ insights

One example of an exchange between researcher and participant where the partiality of the bespoke booklet enabled unique, co-speculative proposals for domestic IoT was in the case of Lauren, a student who lived in a large home with 7 other housemates. Lauren shifted our design called ‘Ceramic Secrets’ to more closely reflect her experience living in a shared home. ‘Ceramic Secrets’ is a small ceramic vessel that keeps secrets it is told and then repeats a random secret when the vessel is held next to someone’s ear. ‘Ceramic Secrets’ was intended to reflect the privacy of Lauren’s room (in contrast to the rest of the home which is communal), but, in our exit interview, Lauren changed the design to collect shared memories with her housemates. She explained: *“I can imagine this being used around and you know, we can have just like have memories about the house... We all say things in [the ceramic vessel] and then every once in a while, once a month or something you’d go up and like hear what everybody said.”* She went further to suggest that ‘Ceramic Secrets’ could also be left in the home for the next group of tenants to listen in on the memories of the former tenants, showing sensitivity to the way shared houses are often semi-transient homes. In this example, we see how Lauren has a unique perspective on her home life, instinctively including her community in her imagined use of the studio’s design proposals, as well as co-speculating alongside us to push designs closer to her lived experience in a shared home.

The partiality of the booklets, and their bespoke nature, was important for creating specific insights with understandable and visceral connections to the speculative IoT proposals for each unique home. The partial orientation of the Bespoke Booklets provided insights into the nature of homes that were not visible without embracing each participant’s perspective.

FEMINIST CRITIQUE

Our use of a feminist analytical lens gave us a framework to refine how we see subtleties about the Bespoke Booklets. However, as we worked through applying this lens to our analysis, we also began to use it as a heuristic to critique our methodology: we found a lack of plurality in how we disseminated and included participants in sharing and exploring our findings.

Potential for broader plurality

While we strove, as design researchers, to position the Bespoke Booklets as a method that seeks partial and situated perspectives which resist universal definitions of ‘home’, we later realized we had created a ‘one-way mirror’ of plurality

in our research process. While we could gain insight from an array of voices, participants were left with only their own voice and experience to reflect on.

Pluralism, by definition, is a refutation of the impulse to aspire to ‘universals’ in design. The quality of pluralism, according to Bardzell, refers to, *“design artifacts that resist any single, totalizing or universal point of view”* [2:1305]. One way to resist is to seek out and nurture many marginal voices to avoid inscribing technologies with westernized norms and practices. Pluralism also breaks open single categories (the ‘home’ in our case) to examine conflicting and divergent pluralities within.

The Bespoke Booklets successfully resisted a universal point of view as a research tool and gave our research team exposure to plural visions of the home which lead to rich lineages of ideas. However, we did not include participants in this pluralistic understanding of homes. While some proposals were irreconcilable, some proposals also displayed interesting new areas for exploration that we saw repeat across booklets. This allowed us to explore concepts thematically. One example of such a design lineage explored 3D ambient recording systems. The lineage began during the first round of research as a design to ambiently record the activity in a cabin with a 3D printer. We saw how the possibility to record ambient data in the home and physically represent it was transformed and appropriated to create ‘Etch-A-Roof’, which draws a picture of the scenery outside of the roof of the van every night, and ‘Vicarious Vermeer’, a frame that is repainted every time the owners bring outdoor sports gear into their small closet. While these ideas have a similar conceptual background, the plurality of the booklets allow us to see various materializations of the idea, broadening our understanding of the design space.

Without a feminist lens to reflect on our methods, we could have missed an opportunity to, in the future, include participants in pluralistic visions of homes to enrich their experience and participation as co-speculators. Participants knew that we were conducting this study with others. Some were curious to see the broader picture and to compare the variations in alternative futures that were created through the plurality of booklets. For instance, Karey mentioned: *“Yeah, I think you guys put these online like, like stripping out names, but like I would absolutely love to see what other people like come up with. I think that’d be really fun to have a little like... zines online”*. In a future iteration of this method, it is possible to imagine how participants might also start to see lineages, tensions, or themes emerge in ways that the research team might overlook. Sustaining participation and plurality throughout the project and analysis would allow for other layers of knowledge to be added, benefitting both the research team and the participants.

Material records of co-speculation: missed opportunity

Co-speculation calls for creating ways in which co-speculating participants can actively and generatively participate in a shared speculation. The Bespoke Booklets serve as a record of this asynchronous collaboration of taking photos, sketching atop those photos and commenting on

concepts, all enacted by our design studio and participants. The booklets, once filled, operate as a material support displaying an array of ideas shared between all co-speculators (us and the participants). Furthermore, the booklets also become tokens prompting our last collaborative brainstorms during the exit interviews.

In addition, the Bespoke Booklets as a material record of our co-speculations, become a new form of knowledge transmission between researchers and the field. Following Fox and Rosner's [24] call for action towards more experimentation with forms and ways to report back to the field, we see the Bespoke Booklets as an alternative mode of knowledge representation: one where designers' design experimentations are inseparably intermingled with participants' thoughts and creative processes. Yet, once the study came to an end and our analysis was completed, we put the booklets into individual envelopes and sent them back to each participant, separately. Participants had grown quite attached to the booklets and we were anxious to send them back. In hindsight, we see a missed opportunity for a dissemination that would have been more plural, one where participants could exchange with each other and see the plurality of speculated concepts about future domestic IoT. In contrast to the Typified Booklets workshop, perhaps a workshop here could have been productive and relevant: opening possibilities for participants to discover and discuss each other's ways of imagining personal future IoT while sharing reflections grounded in their own lived homes.

DISCUSSION

Above, we presented the Bespoke Booklets method by articulating our design intentions and participants' insights. We found our Bespoke Booklets became unique, multifaceted probes that allowed space for private reflection as well as collaborative imagination and speculation. Situating sketches in participants' homes supported embodied reflection and response, while the imaginary nature of the concepts encouraged defamiliarization, resisted solutionism, and suspended disbelief. Furthermore, the feminist lens also supported a critique of the Bespoke Booklets, showing potential for encouraging more plurality in future iterations of the method.

Co-speculator: a feminist demarcation

In this paper, we used feminist theory to focus our analysis and to better articulate the specific elements of our method that led towards co-speculation. In this light, we can now draw even closer ties between feminist values and situated co-speculation as well as cast a critical eye on our methodology, finding room for improvement in the future. We observe how co-speculation—which aims to bring designers and laypersons' knowledge and particular expertise on the same platform to create a context propitious to imagination—is fostered by the feminist values of embracing partial knowledge as basis for objectivity, and of recognizing the need for participation to reach generative ideation. Similarly, we notice how experiential speculation—which engages participants in thinking about futures through their senses and bodies to bridge the abstract

inevitability of conceptual design—is nurtured by the feminist orientations of recognizing the power of situated knowledge and of blurring the boundaries of mind and body through embodiment.

In engaging with feminist concepts, we also bring more definition to the term 'co-speculator'. The Bespoke Booklets method allowed both researchers and participants to become co-speculators—each with their partial expertise and experiences—who collectively engaged in the shared project of envisioning futures of domestic IoT. As co-speculators, each knowledge bearer imagines, envisions, and designs; mirroring similar formats within the booklets, each inspiring and building off one another. This role of co-speculator adopts a clear meaning in this light, one which responds more precisely to Rosner's query "*How do we inquire in concert with those in the design setting?*" [44:87]. While the designer or researcher is responsible for creating the playing field upon which co-speculators can engage in knowledge exchanges (as in co-creation) as well as for communicating design research findings (as in all design and research), the designer or researcher too assumes the role of co-speculator. Within the space created, participants and designers alike are supported and encouraged to speculate together as neither designers nor participants but in a new configuration: as co-speculators. Although we do not mean to paint the Bespoke Booklets method as one where participants are equally as empowered as designers and researchers, we believe our analysis illustrates how this method makes space for moments of equality and representation such as defined and called for by feminist theorists.

CONCLUSION

We presented a novel method for situated co-speculation: the Bespoke Booklets. With a feminist analytical lens, we described how the method was collaborative, post-functional, situated, and partial. The lens also allowed us to reveal how we could improve on the plurality of the method. We presented examples from our design studio's perspective as well as from the participants' experiences in the context of applying the Bespoke Booklets method to a project about IoT design for non-stereotypical homes. While we chose domestic IoT, we encourage HCI researchers to adapt this method and analytical lens to a variety of topics aimed at troubling and diversifying views of the future.

The Bespoke Booklets are a modest step towards establishing a toolbox of methods that allow designers and HCI researchers to investigate a diversity of futures around technology together with participants. This method aimed at celebrating situated and partial knowledges in designers/researchers and in participants, while also manifesting conceptual futures in an embodied and felt way to decrease the abstractness of futures discussions.

ACKNOWLEDGEMENTS

We are grateful for the participants—our co-speculators—in this project. We also thank Aubree Ball, Ioan Butiu, Nouela Johnston and Jeremy Viny for their participation in the research project, as well as Daniela Rosner, Sarah Fox, and Kristin Dew for their thoughtful feedback.

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