

FROM BRAINSTORMING TO BODYSTORMING: CO-CREATION WORKSHOP ANALYSIS USING APPLIED VIDEO ETHNOGRAPHY

HUMAN BEHAVIOR AND DESIGN RESEARCH

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ABSTRACT: The purpose of the study is to understand how to better design a provocative financial planning toolkit that aims to 1. build trust and empathy between financial advisors (service providers) and clients (service recipients) and 2. facilitate constructive and meaningful conversations around the ambiguity and complexity in longevity planning. We conducted four rounds of 60-minute co-creation workshops with eight participants from various design disciplines to work in pairs to generate four concepts and documented their interactions, covering verbal and non-verbal behaviors. In the study, we focused on behavioral observation and followed the modified conversation-analytic talk-in-interaction research approach—applied video ethnography (Higginbotham & Engelke, 2013; Enfield & Levinson, 2006; Pink, 2004) to 1. capture participants' behaviors, 2. analyze non-verbal interactions, and 3. represent the insights. The study concludes with five learnings: 1. The intention of collaboration can be projected through body language including gesturing with hands, palms, fingers, arms, and upper bodies. 2. Paper (and other prototyping material) is an accessible, tangible, and shareable medium of collaboration to shape ideas collectively at a relatively low cost. 3. Participants use eye contact to transmit their self-confidence, exchange ideas, and read their collaborator's eye contact and facial expressions to receive their feedback, concerns, and thoughts. 4. Participants' tone of voice is not only about content discussion but also emotional expression. 5. The need to create a better shared co-creation desktop space naturally emerged between the two participants.

Keywords: Ethnographic Research, Co-creation Workshop, Behavior, Design Process, Financial Planning, Service Design

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1. INTRODUCTION

The purpose of the research is to uncover the implications of designing a financial planning toolkit using observational methods. We explored the verbal and non-verbal interactions of two senior designers with different design expertise by discussing the following questions: 1. How do they collaborate and exchange ideas within a limited amount of time (~45 minutes) and with restricted resources (e.g., paper, Post-It notes)? 2. How do they communicate through making paper prototypes? 3. How do they assign, change, and refine tasks and roles during the co-creation session? In the study, we defined the term “senior designer” which means they have at least 4-5 years of design experience in industries across different cultures. To make the research more concrete and easier to explain to our participants, we used the question: how might we envision future financial planning toolkits and services for an aging population as a starting point to observe and document participants' verbal and non-verbal behavior in response to the three research questions above? Due to the project scope, we emphasized behavioral observation in the study.

2. LITERATURE REVIEW

2.1 CO-CREATION WORKSHOP AND BODYSTORMING

We defined a co-creation workshop as a field for ethnographic study (Lee, 2022a; Lee, 2022b). We followed the modified conversation-analytic talk-in-interaction research approach—applied video ethnography (Higginbotham & Engelke, 2013; Enfield & Levinson, 2006; Pink, 2004) to 1. capture participants' behaviors, 2. analyze non-verbal interactions, and 3. represent the insights. We redesigned the co-creation workshop to control its theme, structure and flow, time (60 minutes), number of participants (two people per session), and documentation (Zoom cloud recording and interview transcribing, GoPro 360 camera, Sony Camera, and iPhone time-lapse). Consistency of co-creation workshop facilitation can better help us analyze its result scientifically. The essence of a co-creation workshop is participation, making, prototyping ideas, and teamwork (Lee et al., 2023). Therefore, the observation and analysis will focus on participants' communication and interaction to translate the ideas from 2D concepts to 3D prototypes. We introduce the term bodystorming to describe participants' body language to conclude the things we want to observe during co-creation workshops.

We analyzed participants' body language by breaking it down into five identified items: hand, palm, finger, arm, and upper body. We defined four observation criteria—distance, direction, movement, and angle—and applied them to analyze the items (Table 2). There are various ways to conduct bodystorming with participants, but the intention remains the same: in general, achieving the hypotheses' goals, ideal design outcomes, or futurist scenarios by making participants experience product designs and services through their physical bodies and multi-sensorial experiences, including touch, smell, hearing, seeing, and talk (He & Hsu, 2022).

2.2 BODYSTORMING EXAMPLES

There are two iconic case studies about bodystorming. In 1960, the founder of McDonald’s wanted to optimize the flow of back-of-house operations to enhance the revenue of the business by making it faster and more efficient. He and a few employees repurposed a tennis court, using chalk to draw out the floorplan of the kitchen to pretend that they were making burgers and delivering them to customers (Hancock, 2016).

In 2015, IDEO collaborated with Lufthansa to redesign its long-haul business-class service. One prototyping approach was using chairs to create the in-flight seating experience (IDEO, 2015). Designers, researchers, and clients arranged different layouts of the space easily and quickly by moving chairs around to discuss the user experience at a low cost in time and materials. Murphy discussed the concept of collaborative imaging to explore the relationship between talk, gestures, and material objects in the field of architectural practice (Murphy, 2005).

3. RESEARCH METHODOLOGY AND EXPERIMENT OVERVIEW

In the study, we recruited 8 senior designers as interviewees from industrial, communication, and interaction design, branding, and business—and we paired them into 4 teams to participate in an approximately 60-minute co-creation workshop at MIT AgeLab, providing accessible prototyping materials: letter-size paper, Post-its, scissors, cutting mat, and foam core board.

We selected one team (Team 1) to observe the interaction between 2 senior designers: how they collaborate to co-create concepts and transfer ideas. We considered Team 1 the suitable team to observe and analyze, since Team 1 has a more complete co-creation process, demonstrating the stages of inspiration, ideation, and implementation (Figure 1).



Figure 1. The setup of a co-creation workshop space at the university lab and 4 teams to participate in the experiment.

In analysis, we focus on both the content of the conversation (audio and transcripts) from both participants, and their collaboration (video and screenshot) to transfer ideas to each other. Due to the project scope, we only focused on behavioral observation. Thus we marked the key timestamps in ATALAS.ti by capturing 57 screenshots as visual evidence to decompose the participants’ behavior (Friese, 2019).

4. RESEARCH RESULT

4.1 THE INTENTION OF COLLABORATION CAN BE PROJECTED THROUGH BODY LANGUAGE

One obvious finding is that participants naturally use their body language to amplify the points they want to make (Table 1).

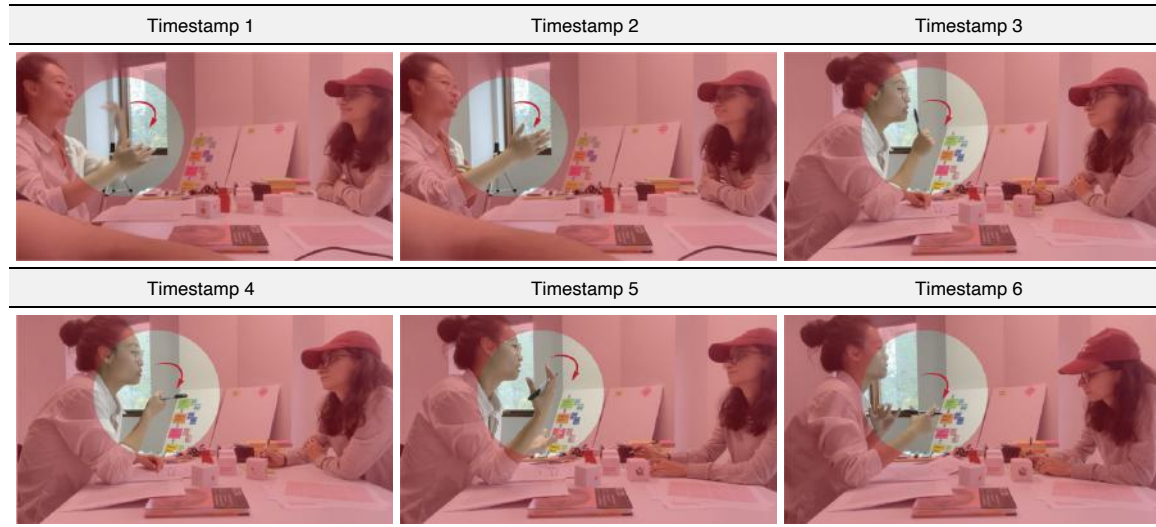


Table 1. The direction and movement of participant's palm can be interpreted as a direct way of communication.

We analyzed participants' body language by breaking it down into five major identified items: hand, palm, finger, arm, and upper body. We defined four observation criteria—distance, direction, movement, and angle—and applied them to analyze the five items. The details of observation notes, five identified items and the brief definition of four observation criteria are shown in Table 2.

Observation Criteria	A. Distance	B. Direction	C. Movement	D. Angle
Brief Explanation	Space or space change between identified items.	Whether the items have formed a directional message.	Length of time the items are in movement in a certain direction.	Angles or angle change between items and horizontal point of reference.
Identified Items				
1. Hands	A-1: We didn't find a significant distance change of both hands, since most participants' "hand expressions/movements" show their direction, movement, and angle.	B-1: We view participants' hands, palms, and fingers as interconnected parts, which can cause the swing direction of their arms and upper body to adapt to achieve the tasks.	C-1: The movement between two hands becomes more frequent and longer while participants want to explain the concepts to others.	D-1: The angles between hands and arms vary creating a strong yet natural momentum to enhance the participants' vibe and overall gesture.
2. Palms	A-2: The participants' palms are not applicable to discuss the distance for analysis; we investigated their direction and movement.	B-2: We observed that participants show the directions of the palm from inward to outward repeatedly when they want to emphasize the importance of the idea.	C-2: The movement of the participant's palm is relatively short and fast, since the main shift is the directional change from inward to outward.	D-2: The participants' palms are not applicable to discuss the angle for analysis; we investigated their direction and movement.
3. Fingers	A-3: When participants want to convince others, the distance between fingers will widen to make it look more	B-3: Participants' index finger is an intuitive way to point out the direction and call more attention to the	C-3: We think it is a small movement compared with the other four identified items and we focus on the	D-3: The participants' fingers are not applicable to discuss the angle for analysis; it makes more

	powerful and dramatic.	conversation.	space between fingers for analysis.	sense to integrate the discussion of angle into the distance, direction, and movement.
4. Arms	A-4: The participants' arms are not applicable to discuss the distance for analysis; we investigated their movement and angle.	B-4: It is relatively difficult to tell the directional change from the movement of participants' arms in most of the video footage.	C-4: The change in the movement of participants' arms is obvious, since it immediately transforms the projective size of the participant's body in front of another collaborator.	D-4: Participants' arms will have relatively large angles when they discuss with others in a stable condition. The frequency of change of angle is also higher when they address some critical points.
5. Upper Bodies	A-5: The participants' upper bodies are not applicable to discuss the distance for analysis; we investigated their direction, movement, and angle.	B-5: Since mostly the two participants sat in their seats, their upper bodies didn't show significant movement with direction. Most are front and back swings when they are trying to emphasize the key points.	C-5: Compared to the speed of their hands, palms, and fingers, participants' upper bodies slowly move back and forth like "breathing" movement.	D-5: Participants' upper bodies will either lean toward the person indicating they are listening or in the opposite direction showing they are receiving the message.

Table 2. Observation criteria and identified items (red font means not applicable in the study).

It is interesting to see how participants project themselves through five intensified items. In general, the movement and behavior change from the participants' hands, palms, fingers, and upper bodies are subtle especially when we only observe and capture the interaction of the two from the video (Figure 2).

Therefore, five (A-2, A-4, A-5, D-2, and D-3) descriptions marked in red text in the matrix (Table 2) are not applicable or we didn't capture them comprehensively or we simply can't document the information only through video and audio (e.g., how do we capture fragrance, room temperature, team vibe through video recording). Since all the observation notes and data are based on Team 1's 60-minute co-creation session, for future study, we can compare the result with the other three teams to generalize research insights for the future participatory session.



Figure 2. The tilted angle and movement of the upper body can indicate the level of engagement between the team during the co-creation session.

4.2 PAPER IS AN ACCESSIBLE, TANGIBLE, AND SHAREABLE MEDIUM OF COLLABORATION TO SHAPE IDEAS COLLECTIVELY.

We found that participants naturally used tangible material—paper, Post-its, and pens—as accessible media to shape their early concepts. Especially in the Team 1 video, we found that the participants kept exchanging paper with written messages or concepts to transfer their knowledge physically.

In addition, the form of paper is cut, modified, or shaped to move closer to their envisioned ideas or design solutions (Figure 3). One great outcome is the paper prototype with the features of visibility and tangibility that naturally enable participants to view it as an obvious prompt to provoke more discussions, challenge their solutions, and open the conversation to build others' ideas.



Figure 3. Tangible material becomes a critical asset to foster productive team collaboration and make communication transparent and easy to understand during the co-creation workshop.

4.3 PARTICIPANTS USE EYE CONTACT TO TRANSMIT THEIR SELF-CONFIDENCE AND EXCHANGE IDEAS.

We are interested in observing participants' eye contact during the co-creation workshop (Figure 4). This is also relatively hard to capture, since the camera was set up on the side of participants' working areas, which only recorded two-thirds of their faces. We can study some of them based on the video footage paired with their conversation and actions.

From the Team 1 video and audio, we synthesized that participants' eye contact transmits a sense of self-confidence regarding their early-stage design solutions with their body gestures and paper prototype. When they shared their ideas enthusiastically, they are not just looking at the physical artifact in their hands; they interact with their collaborator first by looking at their eyes. We viewed it as a sign of self-confidence, delight, and excitement of coming out of new ideas. Reading people's eye contact is an effective way to receive a collaborator's facial expressions, concerns, or questions.



Figure 4. Participants' eye contact was captured during the co-creation workshop (red lines indicate the possible directions of participants' eye contact).

4.4 PARTICIPANTS' TONE OF VOICE IS NOT ONLY ABOUT CONTENT DISCUSSION BUT ALSO EMOTIONAL EXPRESSION.

Participants' tone of voice is also relatively hard to capture and read, even though we successfully recorded their discussion to get the content correctly. The analysis of participants' tone of voice will be better understood in the context of their conversation and interaction, which can easily build empathy around the scenarios. Overall, the voice's volume, emotional expression, and contextual tone are like emotional catalysis to foster the positive vibe of collaboration. In the Team 1 video, we found the collaboration vibe, but it is possible that can also make the conversation less productive, or even worse if participants don't align the goal and the mission with trust.

When the participants are prototyping, the way they express their message is to create a relatively safe condition that is conversational and accessible. Surprisingly, we observe participants' voices have clear ups and downs when they expressed the design intention and told stories to help build a seamless collaboration vibe in the space. It is less about having a gentle voice and more about the expression that helps another collaborator be more empathetic and envision the scenarios that they co-created.

4.5 THE NEED FOR MORE A SHARED CO-CREATION DESKTOP SPACE NATURALLY EMERGES BETWEEN THE TWO PARTICIPANTS.

From the Team 1 video, we observe that an open and collaborative space naturally formed between two participants while making prototypes, using prototyping materials, sketching, and exchanging ideas (Figure 5). Most frequently used materials and tools such as letter-size paper, Post-it notes, tape, and scissors were placed in the middle of the shared area, whereas the reference books, wooden blocks, and toys were moved aside to make more shared space in the middle.

Part of the reason is that the original seating and tables were not movable furniture and the room for the workshop was not spacious enough to move furniture around. For the participants, the shared space of the desktop area was under their control.

Unsurprisingly, through the co-creation process, we observed the need to create a sharable area between two people emerged as a critical condition to enable more effective collaboration.



Figure 5. Shared co-creation table space naturally, dynamically, and gradually emerged during the team collaboration.

5. FURTHER STUDY

This is an early-stage study to understand the interaction and communication of co-creation between two participants with different design expertise, including their verbal (in the previous research memo report) and nonverbal behavior. The design intention is to help us build key considerations about how to create a provocative and conceptual financial planning toolkit with services. Due to the scope of the project, we only analyzed one group video in-depth to analyze and decode their behavior, interaction, and conversation through a co-creation approach. For further study, we can also consider recruiting participants that are not just from design backgrounds. Also, we can look at their demographic information including income level, educational background, location, and even culture difference.

However, we suggest the following areas for further studies. 1. Analyze the co-creation workshop result from Team 2 to 4 and compare them with Team 1 (Table 2) to discuss the advantages, disadvantages, and learnings to generate research insight and evaluate if we can generalize insights integrated into the five key learnings and scale and populate to more universal design principles of describing, facilitating, and enhancing people's interaction, communication, and collaboration in the context of co-creation workshops. 2. Beyond Table 1, what other possible observation criteria (e.g., fragrance, room temperature, team vibe) and other measurable identified items (e.g., the movement of participant's head) can we extend to make the matrix more comprehensive, applicable, and valuable? Do we need to add extra identified items to better describe nonverbal behavior: facial expression, emotion, or mood? How do we describe and measure these new observation criteria beyond documenting them in the text, visuals, video, and audio?

6. DISCUSSION AND CONCLUSION

Having analyzed participants' interaction and bodystorming from the Team 1 co-creation workshop video (Table 3), we came up with five learnings: 1. The intention of collaboration can be projected through body language including the gesture of hands, palms, fingers, arms, and upper bodies. 2. Paper (and other prototyping material) is an accessible, tangible, and sharable medium of collaboration to shape ideas collectively at a low cost. 3. Participants use eye contact to transmit their self-confidence, exchange ideas, and read their collaborator's eye contact and facial expressions to receive their feedback and concerns. 4. Participants' tone of voice is not only about content discussion but also emotional expression. 5. The need to create a better shared co-creation desktop space naturally emerged between the participants.





facilitating the team discussion	self-representing	enhancing collaboration by creating space
		
protecting ideas and building boundaries	emphasizing ideas and amplifying thoughts	brainstorming and digesting ideas
		

Table 3. There are various ways to read participants' hands gesture: facilitating the team discussion, self-representing, enhancing collaboration by creating space, protecting ideas, building boundaries, emphasizing ideas, amplifying thoughts, brainstorming, or digesting ideas.

These help us return to our original research question: how can we design better collaborative conditions, immersive interaction, and communication within teams to facilitate participants to work together seamlessly and productively and exchange ideas with limited time and resources? From the study, the expectation of hosting and participating in a successful co-creation workshop should require and generate 1. productive and effective team discussion, 2. converging and diverging design process, and 3. tangible outcomes with invisible service or experience design considerations.

Therefore, we think that deeply understanding participants' interaction and communication under co-creation to explore their intention and motivation can empower us to move the co-creation workshop or similar participatory activities beyond brainstorming (and strategy) to bodystorming (making, creating, and prototyping) seamlessly integrating participants' verbal and nonverbal behaviors. Through much more understanding and further experiments of verbal and behavioral analysis, we can help envision the core value added to various design roles such as design researchers, design managers, and design strategists.

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