

A Nature HCI Approach to Intergenerational Icebreaking

James Barber

Department of Computer Science
Virginia Tech
Blacksburg, Virginia, USA
jamescbarber32@vt.edu

Aaron Ye

Department of Computer Science
Virginia Tech
Blacksburg, Virginia, USA
aaron@vt.edu

Yiting Wen

Department of Computer Science
Virginia Tech
Blacksburg, Virginia, USA
yitingw20@vt.edu

Austin Allen

Department of Computer Science
Virginia Tech
Blacksburg, Virginia, USA
austinma@vt.edu

Abstract

Technology and nature are often viewed as separate domains, yet their integration has the potential to foster deeper connections between generations. In this study, we explore how asynchronous video storytelling using the Marco Polo app can help connect older and younger adults while enhancing engagement with nature. Over a two-week period, participants recorded and exchanged short outdoor video reflections, creating discussions on personal experiences and memories tied to natural settings. Through analysis of participant diaries, interviews, and video interactions, we found that storytelling served as a useful icebreaker, with nature acting as a catalyst for meaningful intergenerational communication. Our findings highlight the role of place, time, and community in shaping these experiences, revealing both the benefits and limitations of asynchronous communication in fostering emotional connections. These insights inform the design of future digital tools to integrate storytelling, nature, and intergenerational engagement, ultimately strengthening social bonds through technology.

CCS Concepts

• **Human-centered computing** Human computer interaction (HCI).

Keywords

Storytelling, nature, intergenerational engagement

ACM Reference Format:

James Barber, Yiting Wen, Aaron Ye, and Austin Allen. 2025. A Nature HCI Approach to Intergenerational Icebreaking. In *Creativity and Cognition (C&C '25)*, June 23–25, 2025, Virtual, United Kingdom. ACM, New York, NY, USA, 5 pages. <https://doi.org/10.1145/3698061.3733250>

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C&C '25, Virtual, United Kingdom

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ACM ISBN 979-8-4007-1289-0/25/06

<https://doi.org/10.1145/3698061.3733250>

1 Introduction

In today's rapidly evolving digital world, two critical questions emerge: How is intergenerational allophilia affected by AVS icebreaking in the nature? and How can our methodology and tools be improved to foster intergenerational allophilia? As society becomes increasingly tech-driven, these questions are not just theoretical—they are essential to fostering inclusivity and sustainability in human-computer interaction (HCI). Our project seeks to address both challenges. Utilizing Marco Polo, an asynchronous video sharing app, we engaged with two older adults (both over 65) to explore nature based icebreaking. We utilized storytelling to foster a natural and meaningful experience. We designed our methodology to work with the differing schedules of our college workload and the older adults daily activities. On odd days (Monday, Wednesday, Friday), we recorded and shared videos of our outdoor explorations, reflecting on the emotions and memories they evoked. On even days (Tuesday, Thursday), we responded to the previous day's videos, fostering conversations about nature and technology in a comfortable, asynchronous format.

This method yielded insightful results. Our participants became more comfortable with digital communication, reducing technological barriers that often isolate older generations. Simultaneously, as researchers, we gained a deeper understanding of how technology can enhance human connections with nature. Through Marco Polo, we have demonstrated an approach that not only integrates technology into nature but also strengthens intergenerational bonds, paving the way for a more inclusive and connected society.

2 Background

We build off previous Nature HCI, icebreaking, video sharing, and sociology research. Our aim is to contribute a unique approach to intergenerational icebreaking that will prompt future research. The goal of this research is to break down intergenerational bias through a combination of nature, icebreaking, and storytelling. While previous researchers have explored this topic [28], we uniquely use the medium of asynchronous video sharing to accomplish this goal.

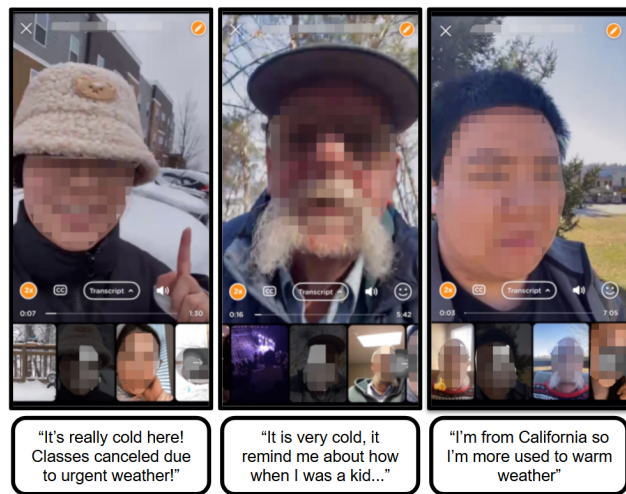


Figure 1: We divided the six participants into two groups, each consisting of two younger adults and one older adult. The members of each group engaged in a Marco Polo group chat, as illustrated above. Group members were prompted to describe the nature around them and tell a story. The text beneath each image is paraphrased from the video transcripts.

2.1 Nature HCI: Overview of the Jones et al. Framework

Many researchers have created technology that engages with the outdoors [13]. Our unique contribution to the field of HCI is a Nature HCI approach to icebreaking. As outlined in our methodology, we used the Jones et al. frame to describe our Nature HCI experience [12]. This model breaks down Nature HCI research into three main categories each with three subcategories, see Figure 2. This model is built on the philosophical foundation of Borgmann: technology is an agent that reduces engagement with reality, specifically nature [4]. Each of the features of this framework can be described as increasing or decreasing its respective natural affects. For example, does the technology increase or decrease the feeling of solitude in nature? We aimed to use this framework to describe our results and to situate this work within the field of Nature HCI.

2.2 Icebreaking through Storytelling

Humans are social creatures, who suffer when lonely and isolated [10]. This reality necessitates the study of tools that will encourage socialization. One such tool is ice-breaking which stimulates connection by speeding up group formation, relaxing social atmospheres, and increasing the outcomes of group work [11]. We are interested in the cross over between storytelling and icebreaking due to both methodologies ability to foster connection [11, 20]. We lean on previous work examining the intersection of ice breaking and storytelling [17]. An effective icebreaker encourages participants to enjoy themselves by discarding formality, status, and authority [1]. This atmosphere can be manufactured with the assistance of technology. Examples of this include wearable technologies, [14], mobile applications, [23], and touch initiated devices [21]. We aim

to contribute to previous Nature HCI research looking at story based icebreaking [28].

2.3 Intergenerational Allophilia

Our measurements of success differ from other icebreaking studies. We attribute this to our Nature HCI framework for evaluation as well as our allophilia, positive feelings between age groups, metric. Intergenerational bias is well-documented, with older adults viewing younger generations as antisocial and unintelligent [24], and younger adults perceiving older adults as incompetent [5, 16]. These biases harm both age groups, who internalize negative stereotypes [26]. While technology often divides generations [19], technological communication can unite age groups [18] and weaken the effects of negative stereotypes [3]. To better understand our participants, we employ the Wagner allophilia model [27]. Wagner et al. adapted Pittinsky, Rosenthal, and Montoya's measures to evaluate allophilia between younger adults (18 - 25) and older adults (65+), focusing on affection, comfort, kinship, engagement, and enthusiasm [27]. While our number of participants limits the statistical significance of our allophilia measures, our results informed by this measurement.

2.4 Asynchronous Video Sharing

In recent years, video sharing has become a part of our daily routines. Millions of users publicly share videos on video-sharing platforms like Facebook and YouTube. Privately, videos are shared on video applications such as FaceTime and Snapchat. HCI video-sharing research sets out to understand the user interactions with video-sharing tools [2]. Researchers interested in enhancing the user-tool interaction look at a wide variety of factors such as effective loading symbols [15], understanding creators with disabilities, [8], content-based voice navigation [6], and minimizing video delays [9]. Research has also considered the importance of human-human interaction: video-sharing speech patterns [25], long-distance relationships over video chat [22], AI-powered conversations [7], etc. Our research is a combination of focusing on the user's experience with an AVS tool while also considering the relationship between the sender and their audience.

3 Marco Polo

The Marco Polo app is an AVS platform that facilitates the exchange of video communications among users. It enables users to record and send video messages to individuals or groups. Video viewers can only respond with a limited number of emojis or by recording a video. Emoji responses are not seen by the video recorder until after the video has been sent. These emojis can be seen on the thumbnail of the sent video. The majority of the interface icons seen in Fig. 1-3 are behind a paywall. For example, our participants did not have access to 2x video speed or taking notes as they watched videos. It should be noted that participants did have access to a selection of voice modifications and video filters.

4 Participants

Our methodology for data collection focused on the app Marco Polo, an asynchronous video-based chatting system for individuals too busy for a long call. In this specific context, we focused

on handling the relationship between the older and young adults. Specifically, we included two older adult, age 65+, participants and 4 younger adults roughly in their mid-20s. Prior to the beginning of the study, participant consent was received. In our experiment, two teams were created, consisting of 1 older adult participant and 2 young adults. The older adult participants were compensated with \$25 gift cards, while the younger participants were compensated with course credit. We did not collect digital literacy data and acknowledge that this would have contributed to a more rigorous understanding of our participants. We will refer to the younger and older adults using the numeric code to maintain anonymity: Younger Adult 1 (YA1), Younger Adult 2 (YA2), Younger Adult 3 (YA3), Younger Adult 4 (YA4), Older Adult 1 (OA1), Older Adult (OA2).

5 Methodology

We conducted a user study evaluating nature based icebreaking through storytelling using the asynchronous video sharing application Marco Polo. We structured our methodology to answer two questions: How is intergenerational allophilia affected by AVS icebreaking in the nature? and How can our methodology and tools be improved to foster intergenerational allophilia?

5.1 Duration and Tools

The duration of our user study was 2 weeks, specifically recording on weekdays. We recorded 3-5 minute videos using the Marco Polo application. We tried to complete our videos before 8 p.m. so as to not inconvenience other members of the team. On Mondays, Wednesdays, and Fridays, we were to record a video in nature, taking it in and discussing either something we saw that day or what the environment reminds us of in our past. On Tuesdays and Thursdays, we responded to our group member's videos. On "responding days" we first watching their videos, and then responding with our opinions and expanded on their video content. See Figure 1 for an example of our Marco Polo group chats.

5.2 Data Collection and Evaluation

We collected data through daily diary reflections, group discussion, age group allophilia surveys and older adult participant semi-structured interviews. The daily diary reflections were completed by the younger adult participants and followed a template. This template was split into diary entries on recording days and responding days with questions focused on what elements were recording, for how long, and notable instances. Our semi-structured interview with the older adults were performed by members of the opposite group. We did this to remove bias in the interview and to encourage the older adult participants to speak freely.

The collected data was subjected to thematic analysis. We first broke our diary reports interview notes into work activity notes. We then categorized them according to the Jones et al. framework [12]. These categories, combined with our age group allophilia survey responses, we the focus of our group discussion. Our data collection and evaluation were structured to answer our research questions: How is intergenerational allophilia affected by AVS icebreaking in the nature? and How can our methodology and tools be improved to foster intergenerational allophilia?

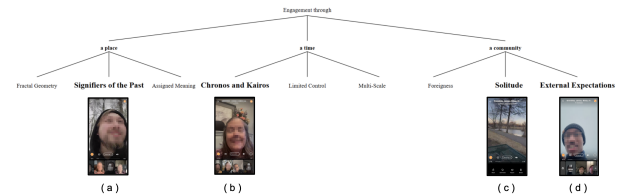


Figure 2: We used the Jones et al. Nature HCI framework to describe our results [12]. The bolded labels represent the main categories in our results. (a) This image shows YA2 telling a story about how an apple tree reminds him of his grandmother; (b) This image shows OA2 telling a story about how time seemed to stop on a trip to the beach; (c) This image shows YA1 recording an empty park and the feeling of being alone in nature; (d) This image shows YA1 discussing the external expectations of the study and how they interfere with his own expectations

6 Findings and Discussion

We organized our findings and discussion into two parts. The first part is a description of our results through the lens of the Jones et al framework. Due to space constraints, we have included the most relevant framework results as seen in Figure 2. The second part is focused on our allophilia survey and results. Our aim is to describe our findings and discussion to explore how intergenerational allophilia is impacted by AVS icebreaking in nature.

6.1 Place

Our results indicate that "place" had a significant impact on participants' experiences. Different physical environments stimulated participants' memories of the past and gave them unique meaning. The following are our key findings within the framework of "place":

6.1.1 Signifiers of the Past. Many participants recalled past experiences in specific natural settings. For example, YA1' experience at a local pond, "Reminded me of my first year at Virginia Tech when I saw the [pond] and heard about it from tour guides" in Diary Entry Recording 2, while YA2 recalled close times with his grandmother prompted by an apple tree, and YA4 recalled his life back home through the warm climate of California, "*Being someone from the California Bay Area, we basically have no weather besides clear skies and a full day of sun*". These symbols are more than just natural landscapes; they are triggers for the participants' personal memories.

These symbols illustrate that natural environments are more than just physical spaces: they carry the emotions and memories of the participants. Through design, we can utilize these symbols to enhance the user's interactive experience with nature. For example, adding symbols with personal meaning to a virtual nature environment may allow users to immerse themselves more deeply in the experience.

6.2 Time

Time played an important role in the participants' experiences, especially the *chronos* and *kairos* nature of time. The following are our main findings within the framework of "time":

6.2.1 Chronos and Kairos. Participants' perceptions of time in the natural environment often differed from actual clock time. For example, YA4 mentioned during the video recording that he sometimes lost track of time, causing the video to be longer than expected, "I got pretty into I was talking about and realized while I definitely gone over 3 minutes, I didn't know how long I had been going." YA1 reported, "watching the snowfall brought back memories of childhood excitement", which allowed him to ignore the passage of time, further supporting the concept of *Kairos*. This subjective experience of time (*Kairos*) was particularly pronounced in natural environments, suggesting that participants were more likely to enter a state of "mindfulness" and ignore the passage of time.

Thus, our design should consider the subjective time experience of the user and not incorporate too many timers or time cues that can disturb the immersive state of the user. For example, the system can have flexible time management capabilities that allow users to freely immerse themselves in their experience in a natural setting without the fear of time constraints.

6.3 Community

6.3.1 Solitude. Solitude is when participants intentionally avoid interacting with others in nature and spend time alone. For example, when YA1 was recording his video at a local park, he said "The quiet and calm atmosphere of the park helped me set the tone for my story." This solitary experience allowed him to better reflect on his childhood memories. Moreover, YA3 was "using my cellular data to watch everyone's videos, but the sound of everyone talking was still very laggy" because of the heavy snowfall. This demonstrates that the experience of being alone in nature can also be emotionally challenging.

Our design should help users find a balance between solitude and socialization. The design should allow users to find solitude opportunities in nature, such as providing distraction-free features to block message notifications. At the same time, the app should also provide users with the necessary social support, such as equipping them with a small AI assistant to support virtual companionship.

6.3.2 External Expectations. External expectations represent to a large extent the expected outcome of the app from all the stakeholders, so it mainly determines the direction of the software developer's feature design and development. For example, YA3 mentioned that she felt the need to share some nature-related stories while recording her video, although that wasn't always her first choice. She said: "I think it's more of a natural element than an outdoor one." This external expectation (e.g., assigned to share nature stories) influenced the content and experience of her recording. Additionally, what most interested YA2 "wasn't an outdoor view but the events people talked about," which proves external expectation also influenced users' responses to others.

The future design should respect users' personal preferences and avoid imposing too many external expectations. For example, by providing flexible topic options (e.g., nature, philosophy, literature,

astronomy), our platform can allow users to choose to join online communities on related topics according to their interests and needs by recommending relevant communication groups based on users' preferences.

7 Design Implications

In normal settings, participants' experience of time generally deviated from actual clock time. For example, YA4 said, "I got pretty into what I was talking about and realized while I definitely gone over 3 minutes, I didn't know how long I had been going." This suggests that he would rather ignore the passage of time when recording. Therefore, a timer can help users have more control over the video length and avoid lengthy narrations. Although a timer can affect the user's perception of time in nature (*Kairos*), we believe it is an acceptable trade-off, especially when the video length is constrained at 5-10 minutes, and can help users focus more on the critical content.

Participants often had difficulty starting and ending conversations. For example, YA3 mentioned, "I didn't have time after a busy day to go anywhere else before 8:00 because I didn't have a car either." This suggests that she felt time pressure while recording the video and had difficulty finding the right topic to start a conversation. Therefore, our system can provide some ice-breaking tips (e.g., topic suggestions or question guides) to help users start the conversation more easily. At the same time, the end of the conversation should not just be "ghosting", but a natural transition, for example, by prompting the user to summarize or share their feelings to avoid sudden interruptions.

Participants often needed prompts to guide their narratives while recording their videos. For example, YA3 mentioned, "I mentioned natural selection in the animal kingdom and natural selection in humans in today's video. I think it's more of a natural element than an outdoor one." This suggests that she needed some thematic cues to organize her narrative while recording the video. Therefore, the system can provide nature-related topic prompts (e.g., "Share your favorite outdoor activity" or "Describe a nature scene that moves you") to help users find the entry point for recording videos more easily. In addition, multi-language support helps non-native speakers express themselves more fluently.

8 Conclusion

We set out to explore AVS in nature's impact on intergenerational allophilia. Over a period of two weeks we shared videos on Marco Polo with our older adult participants. Our results were described using the Jones et al Nature HCI framework. We found that our methodology was an effective icebreaker and served as a catalyst for intergenerational allophilia. Our implications for design and insights will inform future intergenerational Nature HCI research and prompt creative solutions to intergenerational bias.

Acknowledgments

We would like to thank Natalie Andrus and Dr. Scott McCrickard for their invaluable support and contributions to this research.

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