

Designing Collective Experience: A Research-through-Design Framework for Gameful Multisensory Interaction

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Abstract. This study investigates how multisensory and gameful interaction can be mobilized to shape collective embodied experiences within contemporary media environments through an interactive installation, *Garden of Balloons: Synaesthetic Play and Collective Perception*, which is designed around shared multisensory play. Through touch, scent, sound, and visual feedback, participants engage in collective activities that form the basis of this research-through-design (RtD) investigation. As participants move and play together, they begin to respond to one another in ways that create moments of shared attention and connection. Drawing observations, video recordings, and participant reflections, this study reflects these moments and derives a set of design principles for future multisensory and gameful experiences. At a time when many everyday interactions take place through screens and digital platforms, the findings suggest that multisensory gameful systems can create opportunities for people to pay attention to one another and share experiences in the same space. Moreover, interactive art becomes more than a medium for expression. It can also provide moments for people to connect, participate, and experience a sense of togetherness.

Keywords: Multisensorial experience design, embodied art, gameful design, affective interaction.

1. Introduction

As digital and interactive artworks become immersive, audiences are often invited to move, listen, touch, smell, and act with others as part of the work itself rather than being positioned as detached viewers. This supplement, in addition to visual observation, raises a question: how do these artistic installations generate meaning, emotion, and social connections? Dourish addresses this question through the concept of embodied interaction, arguing that meaning comes into existence within a particular social and material context. Bodily engagement and practice are part of the process by which meaning is produced [1].

The power of multisensorial experience in shaping engagement is increasingly a topic of discussion among artists and researchers. For example, a synesthetic design study by Deutsch shows that translating music into color can increase the audience's perception and response towards the surroundings [2]. Hansen further connects this dot to the evolving digital media ecology today, where affect does not register in digital images but is generated from the interaction between the body and the digital images [3]. Embodiment is not a gift for the artistic experience but the stable for how people feel and understand the experience.

Adding to the background, fragmentation appears between the individual's experience and society, especially in contemporary urban living and advanced digital media ecology. Although social media platforms enable networked participation, the connections are often structured by "affective publics." This term, borrowed from Papacharissi, points to people being mobilized by shared expressions of sentiment rather than sustained collective structures [4]. And what contributed to the fragmentation is that the formation of affective publics is fluid and emotionally driven, producing temporary feelings of connection without long-term relational grounding.

In response to this condition, a growing interdisciplinary group of artists and researchers seeks creative practices that reintroduce embodied, shared perception and collective engagement. For instance, Li describes the "collective emotional healing function" of sensory theater. In this performance research, audiences perceive the "breath and rhythm of others" through multisensory

staging, and shared sensorial immersion enables participants to experience togetherness not only through narrative but also through co-present bodily perception [5].

Although scholars such as Li have examined multisensory interaction and embodied experience, existing research has paid less attention to how gameful structures organize these elements into collectively meaningful engagement with social connections. Hence, this study addresses this gap and asks how multisensory and gameful interaction can foster collective affect and shared agency. This study draws on the development of *Garden of Balloons: Synaesthetic Play and Collective Perception*, a multisensory installation designed around collective play. Bringing together touch, scent, sound, and visual interaction, the project explores how shared sensory experiences can encourage participants to attend to one another, coordinate their actions, and experience moments of connection. Through this design process, the study introduces how social and emotional relationships can shift through shared participation. It also proposes a set of design principles for multisensory gameful experiences and reflects the role of interactive installations as spaces for collective engagement.

2. Theoretical Foundations of Embodied Multisensorial Art

2.1. Synesthesia and Perception Theories in Artistic Representations

An experience in which the boundaries between the senses become blurred is synesthesia. While it has long been studied as a perceptual phenomenon, it has also inspired artists and designers seeking to create connections among various sensory forms. Research suggests that these cross-sensory relationships can deepen both perception and emotional engagement, allowing experiences to be felt through multiple sensory channels at once [6].

Multisensory design involves more than the simultaneous stimulation of different senses. People comprehend and act in response to the environment through experiences that register the body in multisensory ways, and both Hansen and Gallagher deem bodily perception the core medium for producing one's experience and perception [3,7]. In their view, multisensorial design's values lie in the body's interaction with the environment, which then organizes and shapes sensorial experiences. Filimon's work further demonstrates that senses, whether visual, auditory, or tactile, can sustain participants' emotional investment in interactive environments, thereby making the experience more immersive [8]. This transition mirrors Dourish's embodied interaction concept, viewed through an interaction lens, in which audiences engage with the multisensorial artistic piece with their bodies and thereby participate in the production of meaning [1]. Manning also proposes that the body should not be a fixed entity but a dynamic process of production and change through movement and relational encounter [9]. In other words, the synesthetic process won't stop at the level of perception but continues to function in constructing a relational network of sensory cues among the individuals involved in the experience and their surroundings.

Cross-sensory art practices, or "multimedia syncretism," in Filimon's term, intersect human sensory curation with spatial elements, allowing the senses to interact with one another and becoming a trend in the field as digital technology develops [8]. In such an environment, audiences become active participants in shaping the experience, which is why immersive installations emphasize rhythm, materiality, and other sensorial stimuli.

2.2. Bodily Perception of Audiences

The field of embodied cognition and performance studies views perception as the product of bodily engagement with the surroundings, in which experience emerges from this process rather than from a cognitive process after perception. Gallagher discusses this perspective in relation to the enactive theories of embodied cognition, in which meaning arises through dynamic engagement rather than detached observation [7]. Under this theory, the audience perceives, acts, reacts, and reflects throughout the experience because the designed environment enables them to be active participants rather than passive viewers. The body is an interface that gives rise to perception, emotion, and

thought, not merely the medium in which perception occurs, as Manning describes in the previous section [9]. In artistic contexts, such as dance, studies in synesthesia and embodied resonance suggest that audience participation shapes the experience itself more than helping audiences interpret the work. Specifically, Piccolo Álvarez describes embodied empathy as a mirroring process: audiences observe and absorb the performer's rhythm and movement through their bodily responses, then unconsciously reproduce the performance [10]. This process echoes with what Gallese describes as embodied simulation theory [11], and both highlight that perception is not purely observational. The process of simulating others' behavior and emotions internally is the definition of perception, and the root of emotional experience stems from shared sensory and physiological conditions. The literature reveals that the body is not a medium that passively bears sensorial stimulation, but the source of perception and emotion, an actor in the construction of experience. Such a framework leads this study to understand multisensorial arts as a bodily engagement-driven interactive system in which audiences' participation with the designed environment is integral to the artwork's experiential formation and activates the piece's unfolding.

2.3. Potential of Blending Multisensorial and Embodied Experience

Building on these perspectives, recent research has increasingly examined the affective and psychological potential of multisensory and embodied interaction, specifically in how synesthetic and multisensory practices influence emotional and social experience beyond aesthetic appreciation [5,8]. Rather than operating at the level of isolated perception, multisensory environments can influence how participants feel, relate, and synchronize with one another within shared space.

When sensory cues are closely coordinated, participants may begin to share rhythms of attention, emotion, and response. This echoes Anderson's concept of "affective atmospheres," which posits that emotions flow between the body, environment, and interaction, rather than being confined to the individual [12]. Similarly, Masumi argues that emotions operate at the level of consciousness through intensity, movement, and sensation before entering structured cognition [13]. These ideas collectively point to a view of multisensory art in which collective emotions are generated through experience rather than direct representation.

What happens in *Garden of Balloons: Synaesthetic Play and Collective Perception* demonstrates this perspective: throughout the experience, there is no storyline to evoke cognitive emotions. Participants understand the collective efforts through practical actions such as popping balloons, adjusting pace, and observing others' behavior. In this process, their individual actions interfere, and their connections are formed not through dialogue but through practice.

Many contemporary multisensory artworks likewise rely on both sensory stimulation and viewer participation, in which meaning emerges from how they interact with one another during the experience, adding to the tradition of what passive viewers see or hear. In *Garden of Balloons: Synaesthetic Play and Collective Perception*, participants move through the space together, adapting to the ever-changing rhythm and experiencing bodily movement. These interactions create opportunities to connect without verbal communication.

3. Gameful Experience and Participatory Mechanisms in Interactive Art

3.1. Translating Gameful Design and Motivational Mechanisms into Artistic Experience

Gameful elements, such as museum or art installations, prompt engagement and sustain emotional investment to varying degrees. Many contemporary interaction designers use gameful elements to enhance audience engagement. Deterding's definition of gamification, or the term "gameful design" in this study, surveys the trend of applying game mechanisms in non-game contexts [14]. However, the elements that are gameful in games, such as rule-based mechanisms and scoring systems, have the potential to translate into other forms in artistic practice. The key to this translation is to consider building a consistent loop of relational participation between the participant's interactions with the surroundings and the surroundings' feedback. The word surroundings here refers to both other

participants and the environment. This translation of gameful functions serves more than just entertaining purposes, as it influences how participants respond to their surroundings in the shared environment, shaping their actions as well as the relational structures with those surroundings.

As Isbister notes, games provide a “useful vehicle for generating prototypes of new constellations of people and sensing and output technologies” because they emphasize moment-to-moment interaction and emotional experience [15]. This study understands this use of gameful design as a strategy for organizing and structuring relationships among participants and for exploring new forms of social and embodied engagement. To elaborate, embedding a gameful system through the design of rhythmic coordination and sensory feedback in multisensorial environments activates curiosity. It motivates participants to engage with the experiential process, thereby fostering a shared, bodily- and sensory-driven social interaction space through collective participation.

Many gameful systems rely on a combination of goals, challenges, pacing, and feedback to drive engagement. These elements are often associated with the flow experience, which Csikszentmihalyi describes as a state of deep immersion in an activity [16]. In a flow state, one’s attention is highly focused, and a common sign is that participants in the activity may lose track of time. In interactive art, designers can encourage this experience through well-designed tasks and controlled pacing of multisensory feedback. For example, *Garden of Balloons: Synaesthetic Play and Collective Perception* offered participants a way to engage with collective struggle through the activity itself. There was no narrative explaining what cooperation or artistic experience should look like. Instead, participants had to find their own rhythm while responding to the changing pace of the interaction and the actions of those around them. At certain moments, attention shifted away from individual performance toward the group as a whole. These moments of connection emerged through participation rather than discussion.

To elaborate on the emergence of the connection, observations during the installation revealed that timing and physical effort became shared concerns, as signified by participants continually adjusting to one another without speaking, creating brief connections through collective action. Hence, how participants behave and coordinate with each other in the space contributes to the formation of a multisensorial experience. In *Garden of Balloons: Synaesthetic Play and Collective Perception*, the use of gameful elements encourages participants to interact with the surroundings and construct a collective experience. Specifically, a shared challenge and the rhythmic mechanism of interaction prompt participants to adjust their actions and attentions, considering others’ movements. Participants can instantly perceive how their actions impact the space through sensory changes in the surroundings. This feedback loop connects participants to their surroundings and strengthens awareness of the effects of their collective actions.

3.2. Emotional and Social Functions of Gameful Design in Multisensory Spaces

When an interaction incorporates gameful and multisensorial environments, it influences people’s approach to connecting with the surroundings and unwraps the intended interaction. Collaborative and rhythm-based system studies show that shared activities can prompt participants to pay attention to each other’s behavior and coordinate with one another [17]. This social connection is not automatic; it develops through continuous interaction and responses that accompany adaptations in collective participation. This perspective views a gameful system’s functions as not limited to entertainment, where the designed structure itself is a relational framework that artists and researchers can use to organize and induce social interactions. For immersive installations, elements such as sound, bodily movements, and special senses play a role in shaping emotional experience, but this emotion does not emerge from an individual’s internal. Brennan addresses this affect as an atmospherically flowing and transmitting power among bodies rather than a private state sealed in individuals [18]. Based on this understanding, the timing of multisensory responses can organize the process of participation, fostering coordination among participants and setting the conditions for emotional flows. When participants respond to changes such as rhythm and spacing, emotions can move across individuals’

borders, circulate within this shared environment, and form a collective perception and affective experience.

Murgia [19], Curwen et al. [6], and Sun and Huang [17] discuss multisensorial participation from different angles. Still, these studies share a key aspect of collective affect's formation: the emergence of emotional responses is shaped by interactions with the surroundings, not by an individual's inner life alone. In this process, attention, timing, and responsiveness stand as the variables that influence the experience. Similar collective affect happens in *Garden of Balloons: Synaesthetic Play and Collective Perception* as well, when the participants sense others' behavioral changes and adjust their own movements to participate accordingly. These subtle adjustments accumulate as the activity progresses, gradually leading to a collective rhythm and fostering a sense of collective involvement. Therefore, the installation translates gameful design's goal-driven system into a framework that prompts the formation of relationships by organizing the conditions for interaction and guiding participants' coordination, thereby enabling collective participation and shared affective experience.

4. Collective Flow as a Social Interactive Game for Audience Participation

Psychological studies define flow as an individual's mental state [16], but other studies began to examine how collective experiences develop similar mechanisms. For example, Sun and Huang indicate that a shared flow could emerge when participants adapt to and synchronize with patterns of attention or rhythms of action [17]. In such an emergence, whether in performance arts, concerts, or installations, participants take action around the same experience within a similar temporal condition and sensory environment.

In the discourse on collective participation, rhythm is a recurring concept, as it involves sensorial cues in interactive installations such as musical tempo, the speed of visual presentation, or the frequency of spatial transformation. Sun and Huang indicate that a shared rhythm can help participants to maintain their attention and coordinate each other's behavior because it provides a temporal organizational framework that not only shapes the atmosphere but also impacts when the participants will take action, what they will react to, and how they comprehend the changes in the surroundings [17]. Along the same lines of synchronization, Piquero Álvarez further explores the process by observing audiences' reactions to rhythmic audiovisual movement and reveals the connection between sensory spars and bodily reactions [10]. Other scholars examine how touch and smell evoke memory and emotional associations from a multisensorial perception perspective [5,6]. All these studies show that multisensorial experiences interconnect embodied resonance and cognitive responses.

In a performance study, Fischer-Lichte put forth the concept of the performative feedback loop, arguing that, under bodily co-presence, participants continuously impact one another, and this participatory effect becomes an essential mechanism of power, propelling the performance [20]. This theory is enlightening for understanding collective flow because synchronization doesn't occur at the beginning of a collective activity but emerges as participants gradually become aware of their surroundings and consistently respond to shared environmental conditions. How environmental sensory cues impact the distribution of attention, coordinate participants' behavior, and shape collective interactions in a shared space is the shared core inquiry in these different studies. The installation *Garden of Balloons: Synaesthetic Play and Collective Perception* translates this logic into a structured multisensorial interaction system where sound and projection provide a rhythm that guides participants' attention, scents accumulate with the progression of the interaction, which also marks the participation from earlier in the activity, and touch becomes a bodily participation and emotional release's direct medium. When these sensorial elements interact, participants pay attention to both the installation's physical changes and changes in others' behavior. In this process, a shared rhythm emerges, eventually giving rise to coordination and collective participation.

4.1. Methodology

This study's methodological framework is Research-through-design (RtD), which means that the installation is not the final artifact of the study; rather, the process of inquiry in developing the installation constitutes the study. The design practice and the research proceed simultaneously and shape each other. The study adjusts the rhythmic feedback system of the senses in space and curates participation, making the design process an approach to producing knowledge and deepening inquiries into multisensory and collective experience.

Observations made during the installation's exhibition session are considered evidence for analyzing how participants' actions and reactions influence and are influenced by the surroundings. Nonetheless, this study neither sets a standard for evaluating participants' performance nor specifies any goals for completion. It examines how participants achieve synchronization through coordination in response to rhythmic feedback or interactions within the space. The study analyzes two sources of material: video recordings of the exhibition session and notes documenting participants' reflections. This study expanded on the notes taken immediately after the exhibition to capture immediate conscious inputs about the experience. In contrast, the video recording captured real-time interactions during the session, supplementing the unconscious conditions of collective participation. The study uses an iterative approach to analyze the materials and identify parallels with concepts in the literature review [21]. It did not code categories before material analysis; instead, it found recurring patterns, such as hesitation, sensory awareness, and coordination with other participants during the iterative process.

This study summarizes these patterns into a design framework with principles to demonstrate how multisensorial and gameful interactions can prompt the production of collective affective experience. The goal of the study was not to produce generalizable findings, but to identify design insights that may be useful in future work on multisensory and participatory interaction and gameful experience [22]. Participants voluntarily engaged with the installation during a course-based exhibition session, and all observational materials and reflections used for analysis were collected with participant awareness. The installation relied heavily on participant involvement. What happened during each session depended on how participants responded to one another, to the sensory cues embedded in the work, and to the changing conditions of the activity itself. Participation, therefore, formed part of the research process rather than serving only as a means of evaluation. Consistent with RtD approaches, knowledge was generated through designing, observing, revising, and reflecting on the work as it developed [22, 23].

5. A Design Framework for Gameful Multisensory Collective Experience

Both theories in the literature and observations in design practice help this study identify the design conditions that support shared participation in multisensory gameful interactions. These conditions form a framework that emerged from the development and analysis of the installation *Garden of Balloons: Synaesthetic Play and Collective Perception*. However, the framework is not necessarily a universal formula for producing specific outcomes. It highlights recurring patterns that may help designers consider how collective experiences take shape through interaction. This study builds a framework with three core principles: sensory coupling, embodied interaction, and temporal structuring, because the combination of these principles systematically stimulates the senses, enables bodily participation, and organizes time to shape participants' collective experience of an artistic installation. The study establishes principles during the RtD process that result from patterns emerging from the iterative installation and the recollection of the research and exhibition process in this study.

5.1. Sensory Coupling

In *Garden of Balloons: Synaesthetic Play and Collective Perception*, the relationship among different sensory cues shapes participants' experiential process, in which different senses interact

within the body and transform input from the surroundings into outputs through participants' actions that influence the surroundings.

5.1.1. Aligning Multisensory Experience

During the exhibition session, participants rarely treat different sensory cues separately because changes in the surroundings that stimulate the senses layer on top of one another. When a participant strikes a balloon, a popping sound occurs, the installation's visual form changes, and the balloon releases a scent. This compound sense influences how participants perceive the installation, as when an artistic installation engages multiple senses, it prompts participants to adjust their attention and actions to integrate the sensory information into a coherent response.

5.1.2. Effort–Sensation Transformation

Gameful design's value is not limited to traditional game mechanisms in the rules, such as score-based rewards. For an interactive experience, actions produce visual or sensory consequences within the installation itself, forming a gameful system of its own. During the exhibition, participants returned to the activity without prompting, suggesting that the installation's changing condition remained engaging through its own structured gameful feedback loop, such as striking an object that releases scent, generates sound, or leaves traces on the structure.

5.1.3. Residual Sensory Traces

Fragrance lingered in the room, marks accumulated on the object's surface, and sounds from the group's earlier actions shaped a representation of collective efforts. The participants referred to these lingering traces when discussing the installation afterward as “the space remembers.” The sensible residues bring the acts of embodiment into the changes of surroundings.

5.2. Embodied Interaction

In *Garden of Balloons: Synaesthetic Play and Collective Perception*, participation depended on movements of approaching the object, striking it, stepping back, and returning to the group. Because no controllers or screen-based interfaces were used during the activity, the installation demonstrated that interaction occurred through embodied movement within the experience itself.

5.2.1. The Body as Interface

Interaction depended on the physical movement that remained visible to everyone in the room, which became part of the shared activity. Because participation relied on active bodily movement, one person's actions were easily observed by others and could affect them.

5.2.2. Collective Synchronization

The timing of participant actions varied at the beginning of the experience. Some people approached the object immediately, while others hesitated, waited, and observed before taking a turn. As the activity continued, differences in pacing became less noticeable, and participants began taking turns, striking the object with smoother transitions between strikes, and asking questions at similar intervals or reacting to the same audiovisual moments.

5.2.3. Open-Ended Play Structures

Participants received only minimal instructions, such as the basic turn-taking structure, before the activity began. There was no prescribed way to approach the object with the intention of creating a non-judgmental space. Some participants struck the object repeatedly, while others waited for timing cues, such as when the background audio tempo closely matched the strike, before acting. They also appreciated each other's approach to the experience. Therefore, participants inherit the openness of the play structure, thereby opening themselves to the experience and to each other.

5.3. Temporal Structuring

Temporal structuring refers to how interaction unfolds over time—during the development of *Garden of Balloons: Synaesthetic Play and Collective Perception*, pacing, repetition, and rhythmic feedback played an important role in shaping participant behavior. Rather than functioning as a neutral background, structured timing influenced how participants coordinated their actions, anticipated future interactions, and responded to environmental changes.

5.3.1. Rhythmic Feedback Loops

Responses from the installation followed participant actions almost immediately. Popping sound, movement within the structure, or change in scent might follow a strike. The participants can easily connect their own actions to changes in the surroundings as cause-and-effect feedback, because these changes occur almost simultaneously.

5.3.2. Experiential Narrative Arc

Even though the installation activity did not provide narrative instructions, the participants moved among waiting, acting, and reacting throughout the session, making the experience dynamic, unfolding the process, and forming a narrative on its own. Specifically about the evolving process, the collective actions make balloons pop and gradually build a stronger scent in the space, creating noticeable shifts from moment to moment and forming an experiential narrative arc.

5.3.3. Durational Curation

Even though the background music's tempo remained the same and every participant followed the routine of waiting for their turn, acting, returning to the group, and waiting again, there were rhythm changes in the process. Specifically, regarding participants' investment in their actions, some moved with a full range of motion from the beginning of the session. In contrast, others hesitated and observed the eager participants for several rounds before joining the activity. This emotional synchronization is a process, and people took time during the collective activity to observe others, comprehend the approach to interaction, and adapt to the rhythm of the space that forms this synchronization.

This framework represents patterns that emerged during the development of the installation, and each principle within it focuses on different aspects of design and influences one another. At the same time, they all point to the question of how we might create conditions for people to participate in collective activities eagerly, respond to their surroundings, and form shared experiences. In this way, the framework emphasizes coordinating sensory cues, bodily action, and temporal structure to propel relationship-building among participants by fostering awareness of the surroundings. The framework is not intended as a prescriptive model, but as a set of design considerations that may be useful for future work in multisensory and gameful interactions.

5.4. Project Overview: Rethinking Pain, Play, and Collective Growth

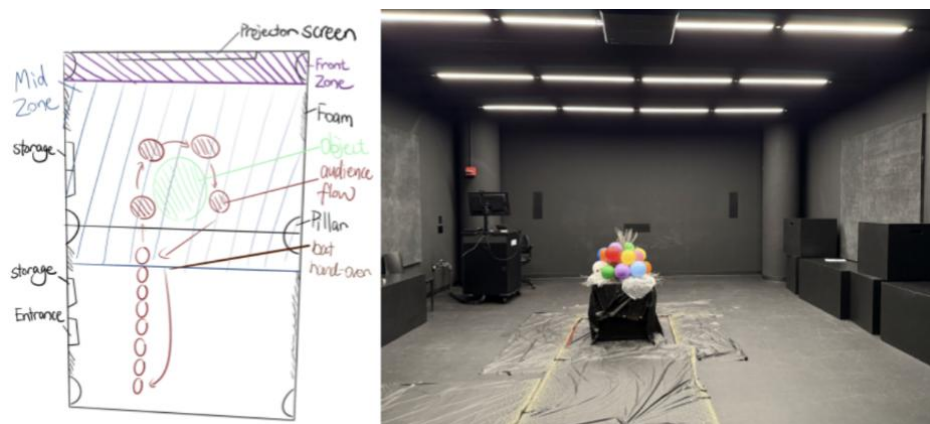


Figure 1. Spatial configuration of the installation environment

Garden of Balloons: Synaesthetic Play and Collective Perception was developed during this RtD project as an interactive installation exploring multisensory participation in a group setting. The installation was presented in a blackout room designed to accommodate approximately 15 participants at a time (Figure 1). Suspended near the center of the room was a piñata-inspired object containing balloons and scent materials (Figure 2). Textured floor surfaces were distributed throughout the environment. During the session, participants approached the object individually, struck it, and then rejoined the surrounding group while waiting for another opportunity to interact. The activity followed a repeated sequence in which participants waited with the group, approached the central object when it was their turn, struck it, and then returned to the surrounding space. However, the pace and intensity of participation varied from group to group. No competitive goals were introduced.



Figure 2. Piñata-inspired interaction object with embedded scent-release structure

Balloon components burst during use, producing sharp popping sounds that stand out against the background audio and signal to participants the other's presence. Repeated strikes gradually altered the appearance of the central object and highlighted the participants' active role throughout the experience. Scent materials placed inside the structure released fragrances at different points during the session. Participants entering later in the activity encountered conditions that differed from those present at the beginning. The smell in the room became stronger over time, and marks on the object accumulated as more people interacted with it.

The turn-taking structure resembled playground games in which participants repeatedly perform the same action while waiting for others to finish. A music video was projected throughout the session and remained visible from most areas of the room (Figure 3). Participants responded to it differently, with some timing their actions to match the music, while others appeared to pay closer attention to nearby participants than to the screen.



Figure 3. Participant interaction during synchronized audiovisual gameplay

5.5. Feedback, Limitations, and Future Prospects: The Formation of Social Reconfiguration

There were differences in how people invested their actions in the participatory activity. As mentioned, some participants were hesitant and began by observing before engaging. Even by the end of the activity, the difference in how hard each participant struck the object remained. However, as the session progressed, especially in later rounds, many participants began to approach the

installation and interact with a similar rhythm. The video recording analysis showed greater synchronization, with differences reduced compared to the earlier rounds of the session. During the earlier rounds, participants enter the space with curiosity, and the collective resonance has just begun to form when the sound of popping balloons elicits instant reactions. Some participants in line looked over at the central objects, and the people who had just struck the balloons chatted and laughed together, sharing the stress-relieving feeling of popping a balloon. The emergence of these reactions allowed the participants to build connections with their surroundings. One participant described the experience as: “It felt like we suddenly started playing together instead of waiting for others to finish,” showing that the installation transforms an individual’s existence in a space into a collective interaction in a shared rhythm.

The scent element triggers a special reaction in the installation because it is designed to accumulate based on people’s engagement with striking the object. The later in the session, the more scent marks fill the space, and the clearer the participant’s previous actions become. When participants feel this mark of their actions, they gain awareness of their surroundings because they are actively forming the experience, and the scent or changes in the object’s visual form show them the process of forming this installation art. One participant commented, “You can feel what everyone has done before you.” Similar remarks appeared in several reflections collected after the exhibition sessions.

Waiting for one’s turn creates a pause that allows participants to process sensory inputs and respond with outputs. While waiting, some participants watch the background projection video, and some observe other participants to adjust their adaptations to the space. Sometimes people pause during their turns to pay attention to changes in their surroundings, such as the dramatic deformation of an object, which is also a sign of a change in their action rhythm.

This collective activity requires bodily participation through physical movements in the space, including walking to the central object and striking it, which highlights the embodied experience but also poses a limitation for some potential participants with mobility difficulties. Therefore, future versions of this inquiry could adapt various forms of interaction to overcome this barrier, such as using XR technologies to create a more digital environment, while further discussing how multisensory activities can operate in blended realities and how they impact the formation of collective experience and participatory coordination.

6. Conclusion

This study uses *Garden of Balloons: Synaesthetic Play and Collective Perception* as a case to explore how multisensory and gameful interaction connects individuals through shared experiences. The findings show that sensory feedback through rhythm and collective play creates conditions for participants to communicate with the surroundings in an interactive artistic installation. Participants’ gradual synchronization in their collective interaction with the installation shows that they are constantly perceiving and reacting to their surroundings. However, this study does not attempt to offer a universal solution; instead, it presents design principles as starting points for future studies and offers a gameful perspective on multisensorial interactions. These principles form a framework that highlights how relationships, participation, and shared presence shape experiences. To demonstrate that gameful systems organize behaviors beyond the personal level into a space that fosters collective experience and social connections, this study emphasizes how people perceive, act, and interact within such environments. As a result, this study’s findings, including observational insights and the proposed framework, contribute to ongoing decisions in digital creativity and interactive artistic design, with expandable perspectives for future studies, such as gameful multisensorial applications across different technical environments or participatory scales. These further research possibilities explore how multisensorial and gameful designs foster shared experiences and support deeper social connections among people under the mediated and fragmented social environment.

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