Towards A 2nd Person Perspective on Bodily Play

Florian 'Floyd' Mueller
Exertion Games Lab
RMIT University, Melbourne, AU
floyd@exertiongameslab.org

Zhuying Li
Exertion Games Lab
RMIT University, Melbourne, AU
zhuying@exertiongameslab.org

Rich Byrne
Exertion Games Lab
RMIT University, Melbourne, AU
rich@exertiongameslab.org

Eshita Arza
Exertion Games Lab
RMIT University, Melbourne, AU
eshita@exertiongameslab.org

Kurra Harshitha
Exertion Games Lab
RMIT University, Melbourne, AU
harshitha@exertiongameslab.org

Mario Boot
Exertion Games Lab
RMIT University, Melbourne, AU &
University of Amsterdam, NL
mario@exertiongameslab.org

Tuomas Kari
Exertion Games Lab
RMIT University, Melbourne, AU &
University of Jyvaskyla, Finland
tuomas@exertiongameslab.org

Yash Mehta
Exertion Games Lab
RMIT University, Melbourne, AU
yash@exertiongameslab.org

Abstract

Recent HCI work on digital games highlighted the advantage for designers to take on a 1st person perspective on the human body (referring to the phenomenological "lived" body) and a 3rd person perspective (the material "fleshy" body, similar to looking in the mirror). This is useful when designing bodily play, however, we note that there is not much game design discussion on the 2nd person social perspective that highlights the unique interplay between human bodies. To guide designers interested in supporting players to experience their social bodies as play, we describe how game designers can engage with the 2nd person perspective through two design tactics based on two of our own play systems. With our work, we hope we can aid designers in embracing this 2nd person perspective so that more people can benefit from engaging their bodies through games and play.

CSS concepts

• **Human-centered computing → Ubiquitous and mobile computing design and evaluation methods** • *Human-centered computing → Interaction design*

Author Keywords

Body; Play; Social; 2nd Person; Whole-Body Interaction; Exertion Games.

Introduction

Within HCI's game design community, there is an ongoing interest in the intersection between interactive technology and the human body (for example see [16, 21, 23, 24, 26, 35, 39]). This is fueled by technological advancements such as Nintendo's motion-sensitive game controllers allowing for bodily play, wearable technologies such as activity trackers supporting sports-turned-games, and sensors in mobile phones enabling playful physical activity. However, despite these advancements, critical voices have emerged that argue that the field has not yet fully grasped a deeper understanding of the human body and how to design technology for it (for examples see [8, 9, 21, 22, 24, 28-30, 32]). In particular, the critiques have lamented an overly simplistic perspective on the human body [8], where players' bodies are regarded as simply alternative controllers (on the same conceptual level with joysticks, keyboards and gamepads) for interactive game content. The problem with this view is that it obscures the fact that if we talk about human bodies, we are not only talking about physical bodies, but we are also talking about living human beings.

To help game designers go beyond this simplistic perspective of the human body as a controller, in this article we introduce a phenomenologically-inspired perspective of how human bodies interact, which we call the 2nd person perspective, complementing the 1st person "lived" perspective and the 3rd person "material" perspective that highlights the "fleshy" body (similar to looking in the mirror) [25].

We extend prior theoretical work in this area by articulating what this 2nd person perspective can mean for game design. With the aforementioned advancements in technology, we believe that the game design community now has a unique chance to develop digital games and play that not only support players to *use* their bodies to play together but rather as an opportunity to experience their social bodies *as* play. This builds on the idea that we need to consider that humans not only *have* bodies but *are* bodies [25].

We make a contribution in the form of discussing the 2nd person perspective for the game design community. We argue that this 2nd person perspective on the human body can be a valuable design resource for bodily games that are played by more than one player. To support this claim, we examine two existing social bodily game systems of our own. With these systems, we articulate a set of design strategies on how designers can utilize the 2nd person perspective to facilitate engaging social games and play experiences. We wrote this article to aid practitioners interested in designing social bodily games as well as for researchers who aim to understand social bodily games and seek a framework to structure any analysis. With our work, we aim to support designers creating engaging social bodily games and play, so that more players profit from the many associated benefits of engaging their bodies through games and play.

Related Works

Isbister [10] argued that social play is fundamentally different from single-user play and proposed that we need specific design knowledge for multiplayer games. To facilitate the development of such knowledge, Mueller et al.'s social perspective [26] can be seen as a

Figure 1. Balance Ninja – a social game using galvanic vestibular stimulation.

response to this: the authors propose the notion of "relating body" that describes how bodies relate to one another (inspired by van Manen's "Relationality" [20] that is an important dimension of the lived experience) in order to sensitize designers to a specific social perspective. Mueller and Isbister brought their expertise together [15] to develop a set of movement-based game guidelines, one of which stresses the opportunity to "facilitate social fun": the authors argue that the highly visible body movements can entice bystanders to join the game. Here we extend this work by providing a perspective beyond bystanders through which designers can examine social bodily play.

Mueller et al. [28] introduced a perspective of human values from sports philosophy to advance the field of bodily play, however, they mostly focus on solo exercise experiences. Similarly, Wilde et al. [37] and Loke et al. [19] proposed a dance-inspired perspective, and although their systems are used by multiple dancers they are often not considering social bodily experiences, such as when one dancer lifts another. Seif El-Nasr et al. have highlighted unique patterns in social games [33] while Mueller et al. [6] have explored bodily interactions that occur between people, such as when dancing together, and have in consequence proposed a perspective of bodily interplay. Our work builds on this and presents an orthogonal perspective to the bodily interplay dimension. Segura et al.'s work on the "joy of movement" depicts social play scenarios [32] to support co-located bodily play [31], similar to the work by Wilson [38], while Isbister et al. highlight the potential of wearables to facilitate this [13]. Marshall et al. [24] suggested that we need to see the human body from more than one perspective. Consequently, Tholander et al. [36] proposed that

designers should consider both instrumental and experiential perspectives. This was extended by Mueller et al. [25] who suggested the phenomenological terms of "Körper" and "Leib" as a way to tackle different perspectives on the human body in game design. Our article extends this prior thinking by elaborating on the 2nd person perspective that complements the prior 1st person and 3rd person perspectives that the Leib and Körper notions depict. In particular, we use the 2nd perspective to highlight the potential for game designers to engage with an experiential understanding of other people's bodily play experiences. As such, the 2nd perspective helps us to sharpen our focus on how to support player's experiential understandings of the Leib experience of *other* players.

Example game and play systems
We now investigate two existing game and play systems that exemplify our thinking. Based on our experiences of designing, playing, exhibiting and reflecting on these games, we articulate an initial two strategies on how designers can utilize the 2nd person perspective illustrated with our examples. The strategies have emerged through an iterative process in which thinking about the aforementioned concepts has also influenced our design practice in return. This process has been previously used successfully to develop a framework about sensing movement [2], proxemics play [27] and bodily play [25]. By engaging with such a process, we believe we are able to paint a vivid picture that is abstract in nature yet close to design practice.

Balance Ninja
Balance Ninja [4] is a two-player digital game that aims to facilitate an engaging vertigo experience [5]. In
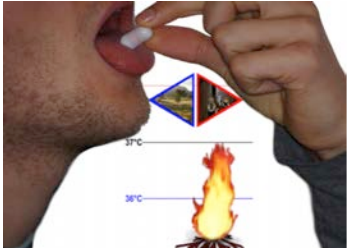
Figure 2. The Guts Game – a social game using ingestible sensors.

Balance Ninja, players must battle to keep their balance whilst under Galvanic Vestibular Stimulation (GVS) triggered by an opposing player (fig. 1).

Both players stand on their own wooden board that rests on a beam. They both wear a GVS system, a safe way of affecting one's balance by applying a small current (+/-2.5mA) to one's vestibular system. Electrodes placed behind each ear deliver the current and the user feels a pull towards the anode and also feels a loss of balance in that direction. Players also wear a tight-fitting pouch attached to their chest containing a mobile phone and the accelerometer readings taken from the phone affect the other player's GVS system. For example, if player 1 leans to the left, the GVS of player 2 creates a pull to the right for player 2 (and vice versa). The more player 1 leans, the greater is the level of stimulation applied to player 2.

The objective of the game is to cause the opposing player to lose his/her balance and either step off the board or touch the board to the floor. Players are free to "attack" at any time. A point is awarded to the winner of the round and the first player to reach five points wins the game.

Examining Balance Ninja from a 2nd person perspective highlights the following: Players experience a sensation of vertigo as a result of digital means, however, this sensation is triggered by another person. Sensations are localized [34], here, this localization comes from another person (like someone else touching you), however, the "strange" and intriguing experience comes from the fact that this sensation is delivered wirelessly over the local network, without participants touching each other (i.e. pushing you so you lose your balance).

Guts Game
The Guts Game is a two-player mobile game, centered around a set of game goals that requires players to change their body temperature that is measured with an ingestible sensor (Fig.2) [3, 18]. It is a pill-like device, which when swallowed, wirelessly transmits body temperature data as it travels through the digestive tract for approximately 24-36 hours. On players' mobile phones the target body temperature is represented by the height of a frying pan above a fire. The animated flame represents the player's current temperature. There are several tasks the players are faced with throughout the day, and upon completion of the task, the player receives points. The goal of each task is to change the body temperature to move the top of the flame as close as possible to the frying pan. The game supports social interaction: the two players can challenge each other using photos and text and also exchange strategies they employed to reach shared challenges.

Strategy 1: Use malleability of bodies' boundaries to intertwine them

This strategy is concerned with the extent to which the play system uses the individual malleability of our bodies' "boundaries" to intertwine multiple bodies. The children's game "the 3-legged race" operates as a useful example. In this game, two children stand hip to hip and use a scarf to tie together the inside ankles of their right and left leg respectively. They then run a race, competing against other pairs. Initially, they will start walking slowly and awkwardly, falling over and tripping, but quickly their bodies' malleable boundaries

are "merging" into one "shared" third leg and the players are able to run as one body.

Slatman highlights [34] how our bodies have boundaries, however, these boundaries are malleable: an example is a walking stick of a vision-impaired person where this person's body boundary includes the stick. Similarly, a person wearing a hat can (after wearing the hat for a while) gracefully enter a low walkway without much conscious effort. As such, a body's boundary is malleable. We highlight to designers that they should consider drawing on this malleability in order to intertwine bodies in novel and intriguing ways.

Balance Ninja reminds us of traditional balancing games where players face each other trying to balance on a small plank. In order to make it more challenging, the players are often equipped with props such as a broom or toy sword that allows them to disturb the balance of the other player. However, this bodily action often causes the player him/herself to fall, resulting in much laughter. In Balance Ninja, players do not have such a "shared object" [6] that draws on the malleability of their bodies, however, the networked system that connects bodily movement with GVS control functioned as such: a player's body boundary was extended through the chest-mounted mobile phone to the vestibular sense of the other player, intertwining the players' bodies in a playful way.

The Guts Game plays with the malleability of the body's boundary through the ingestion of the pill and the resulting data being transmitted to the other player: before swallowing it, the pill is separate to the human body, however, once swallowed, it becomes part of the body and players cannot separate from it until excretion. The data arising from the body, i.e. the temperature data, is then shared with another player, intertwining the two bodies involved. Players commented on how they felt the game play was not happening on the screen, but rather "inside" them.

Strategy 2: Support bodily mimicry

This strategy is concerned with the extent to which a play system supports players in engaging with bodily mimicry. Barsalou et al. articulate how perceiving bodily states in other human beings produces bodily mimicry [1]. For example, if a person scratches his/her nose during a conversation, then the person sitting opposite to him/her is also likely to do the same. This is important for game designers to consider because we know that if two people smile in response to a playful event, it can facilitate each other's expressiveness and emotional experience [17]. Furthermore, if a player perceives facial expressions of emotions, it activates this player's facial muscles that correspond to the perceived emotion (in [17]). It has also been suggested that mimicking serves a social function, for example, people like each other more if they mimic each other and mutual liking can foster relationships between people [1]. In other words, because the other player also smiles, the player's enjoyment is increased [7].

Bodily mimicry can widely happen in play experiences of board games, however, we point to digital games which are designed to be played on the living room's TV, where the position of the screen demands players' orientation facing forward, away from each other. This is cemented further by sensing technologies such as camera-based skeleton tracking (as made popular by the Microsoft Kinect) that works best if players are facing in the same direction, rather than facing each

other. Such setups hinder opportunities for perceiving bodily states and hence opportunities for bodily mimicry (which innovate research games have aimed to address [11, 12, 14]).

Balance Ninja supports bodily mimicry, as the physical setup of the game (two balance boards opposite each other) positions the players so that they face each other. There is no screen (besides the screen that shows the score after each round) that might draw the player's visual attention away from the other player. Players must closely observe their game partner, as they cannot perceive any game state except through looking at the other player: in particular when the player is beginning to lose control of his/her balance (that is visible to the other player through facial expressions and the flailing of arms and legs). As such, the game aims to support a player's experiential understanding (Leib perspective) of the other player's bodily experience by allowing them to experience the other player's off-balance through their vestibular sense. A player's balance is the result of the visual, proprioceptive and vestibular system working together, here, a loss of balance is made visible to the other player (supporting mimicry) and then further stimulated through the use of the GSV system.

In the Guts Game, players are in the same room when the game starts, where they take the pill and listen to a narrative that frames the gameplay (about a parasite in the player's body that is affected by body temperature), hence they have opportunities to engage with bodily mimicry. Once the two players go their separate ways, the ability to share pictures with one another (such as when they achieved certain game tasks) is an opportunity to engage in bodily mimicry:

participants indeed shared pictures of themselves with various facial expressions (depending on whether they achieved their tasks). We propose that in addition to pictures, including a videoconferencing ability might have supported bodily mimicry even more.

Conclusion

Interaction design and, in particular, game design have an ongoing interest in the convergence between interactive technology and the human body, fueled by technological advancements. Yet, recent scholarly work suggests that the field has only just begun to fully understand the various perspectives through which designers can see the human body. To further the field, we introduced the 2nd person perspective as a social view to complement the previously articulated 1st and 3rd person perspectives on the human body and we also began to articulate some implications for design.

In summary, our work aims to contribute to the emerging intersection between the human body and interactive games and play. We believe that for a successful combination of technology and the human body, we need to move beyond seeing the human body as just an alternative input device and recognize that we not only *have* a body but also *are* a body and that this body is a social one. We hope that with our work we are able to support designers with a starting point for better play design and aid in facilitating the many benefits of engaging players' bodies through games and play.

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