Exploring the Combination of Point-of-view and Tenses in Movement-based Design Processes

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Abstract: Our work presented is grounded in Movement-based Design and used for creating solutions with movement as a focal point. Several researchers utilise the moving body in their design for embodied products such as ubiquitous computers and interactive prototypes. The recognition of the moving body is seen in embodied design approaches with a body-centred focused design supporting and encompassing human experience. We believe that incorporating the moving body at the centre of the design process is required to create a future of sustainable movement related to technology, e.g., exertion games, VR or general health and fitness solutions. To understand the nuances of a movement-based design process, we see a need to go beyond the specific design methods. Designers need to approach the complex problem from multiple perspectives. To nuance our movement-based design process, we use the Svanæs and Barkhuus framework to categorise the body-centred design process in two dimensions: Tenses and Point-of-view. The aim is to learn how Point-of-view and Tenses can be utilised to increase the value of the Movement-based Design Process. The empirical material generated in this project stems from two Movement-based Design workshops, each with its own scope: workshop one, the creation of outdoor fitness equipment and workshop two, the creation of technology-based motion games. Both workshops were filmed, and selected participants were interviewed subsequently. The analysis indicated how Point-of-view and Tenses have distinct qualities when interpreted through the framework combined with the empirical material. Point-of-views: 1st-person perspective is used to create insights that are to be shared. 2nd-person perspective is used when two users are designing. 3rd-person perspective creates a distance for analysis. Tenses: Past tense was utilised by watching recorded videos. Present tense creates a feel of here and now, and the future tense was aimed at looking forward in time. The workshops went through several phases, each with its distinct way of working with movement. We wrap up with recommendations for designing a movement-based design process guided by point-of-view and tenses: Start and stay in the 1st-person, let the group share insights, let the participants distance themselves, and the use of tenses should be explicit.

Keywords: Movement-based; Design; Point-of-view; Tense; Design Process, Embodiment, Exertion Games

1. Introduction

The body moves in all aspects of life, and even when it is not moving, movement is happening (Angheloiu et al., 2020). Several researchers use the moving body in design for embodied products such as ubiquitous computers and interactive prototypes (Svanæs & Barkhuus, 2020; van Dijk, 2018; Levisohn & Schiphorst, 2011; O'Brien & Mueller, 2007). Movement is also used in embodied design approaches with body centred design supporting and encompassing human experience via embodied design methods (Höök et al., 2018; Wilde et al., 2017; Svanæs & Barkhuus, 2020; Loke & Robertson, 2013; Höök et al., 2016; Loke & Robertson, 2011).

These approaches and methods have a sensing body in common and a body filled with past experiences, present feelings and aims towards the future. Most importantly, the authors recognise the significance and meaning of the body as a core element in solving complex movement-centred design problems either alone, in a group or through analytical work. Our firm belief is that movement is required as a core element in embodied design to create a future of sustainable movement related to technology such as exertion games, game-based learning, VR or general health and fitness solutions, as proposed, for instance, by Mueller and Young (2018). To design for engaging, exciting and sustainable movement concepts, it is required to incorporate and understand the moving body as the centre of the design process. Thus, we are currently searching for design methods specifically using the moving body, although we are challenged in utilising of the specific method and we, therefore, see a need to go beyond the specific methods.

To understand the nuances of a Movement-based Design Process (MbDP), we see a need to move beyond the specific design methods. Designers need to approach the complex problem of creating future solutions from multiple perspectives and values (Smeenk et al., 2016). The perspectives of point-of-view and tenses are presented by Svanæs and Barkhuus (2020) as a lens through which we can understand body-centred design. Point-of-view and tenses are more valuable as perspectives than using a specific design method for the overall design process (Smeenk et al., 2016; Tomico et al., 2012). The framework proposed by Svanæs and Barkhuus (2020) creates possibilities of understanding by developing a MbDP through applying these perspectives on the

body and exploring from which point-of-view and tense the insights are created. The aim of this paper is to expand the possibilities of future Movement-based Design Processes by using insights gained from applying the lenses of Point-of-view and Tenses in design.

We present how 1st, 2nd, and 3rd-person points-of-view (POVs) have distinct qualities. We found that 1stperson perspective is used in creating insights that must be shared to evolve. 2nd-person perspective can be used when designing solutions including more than one user and was used in sharing insights. 3rd-person perspective creates a distance to analyse the situation. Tenses describe the use of, both past, present, and future. Past tense was used by watching recorded videos. Present tense creates a feel of here and now, and future tense is aimed at looking toward an unknown opportunity.

The paper is laid out as follows. Firstly, we present the theoretical lens through which we understand our design process. Secondly, we present our methodology and methods. Next, we present two cases in which we used movement-based design. We then present an analysis of how points-of-view and tenses were visible in the two workshops. The analysis is divided into phases, with each phase representing a distinct point-of-view and tense being used. Finally, we make recommendations based on our analytical work.

2. Theoretical frame for understanding our design processes

To recognise the nuances of Movement-based Design Processes, Svanæs and Barkshuus' (2020) framework is applied to explore the body as a resource and to make explicit key insights created by the participants. The framework is designed as a 3x3 matrix of two body dimensions: point-of-view and tense.

2.1 Point-of-view in movement-based design

In MbDPs, point-of-view describes the use of three distinct perspectives on the body: 1st, 2nd and 3rd-person (Svanæs & Barkhuus, 2020).

The 1st-person perspective is the person-as-me, described as the body that is me living my life through my perspective (Tomico et al., 2012). This perspective is drawn from the lived body, coined by Merleau-Ponty (2014). The 1st-person view is observed when users focus on themselves and their work. From the 1st-person perspective, users explore their own space independently and develop movements or ideas by themselves without (knowingly) sharing their knowledge with other users.

The 2nd-person perspective is the interpersonal body, the body as you (Svanæs and Barkhuus, 2020). According to Merleu-Ponty (2014), "In creating an awareness of another bodily self, you also create the same awareness in my body." From the 2nd-person perspective, the body is seen as a social phenomenon interacting with other bodies and displaying an innate bodily empathy (Tomico et al., 2012). The 2nd-person perspective is observed when users perform or observe an action to share knowledge or be inspired, either by sharing an artefact, an idea, or a (mirroring) movement.

The 3rd-person perspective is the body seen as an object, the aesthetic body. This is the body one sees in the mirror or the body is seen from the outside (Svanæs & Barkhuus, 2020). Utilising 3rd-person perspective creates a distance to the field in which you are to gain insights by analysing the field (Tomico et al., 2012). The 3rd-person perspective is applied when users view actions to change the action after having analysed it. The 3rd-person perspective is observed when users talk about tweaking an idea to evolve the idea and when users analyse other participants' movements for improvement rather than sharing knowledge, as is the case in 2nd-person perspective (Svanæs & Barkhuus, 2020).

2.2 Tenses in movement-based design

Svanæs & Barkhuus (2020) use tenses to understand what premise creates insights. As a designer, you can be aware of your body in the present. You can also remember the past and how it felt to be you, and you can look to the future and imagine yourself in the future and how that could feel (Svanæs & Barkhuus, 2020). Tenses are applied to describe whether a particular method creates insights from what happened in the past (a memory approach), what is happening now (increasing the awareness of the here and now), or what might happen in the future (focusing on potential and possible outcomes). The three tenses provide the basis for analysing work in MbDPs and from when insights were created, e.g., if the user looked at future possibilities or worked from past experiences.

3. Methodology and study design

We applied a multiple case-study research design to describe, analyse, and understand the users' engagement and actions in the two design workshops. The case study method explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time through detailed, in-depth data collection involving multiple sources of information and reports a case description and case themes (Gustafsson, 2017). Using the multiple case-study design process, we gain a greater understanding in MbDPs. Thus, we aim for the investigation to be illustrative of the phenomenon in depth. This qualitative approach requires tools to be used within the contexts (Gustafsson, 2017) as we did in our facilitation having artefacts to be used by the participants. For data generation, we used observation, video recording and interviews. The process of the two workshops produced insights for several different design mock-ups, and in designing these concept proposals, we sought knowledge into and developed the MbDP.

3.1 Methods

To generate data needed to identify key themes and the nuances of the movement-based design process, observations, video observations and interviews were chosen (Thorpe & Olive, 2016).

3.2 Observation

In the first workshop, we participated on equal footing with the users testing movement-based design, and in the second workshop, we distanced ourselves from the process to facilitate. For both workshops the participants were relatively homogeneous and consisted of 20-25 participants who all work with/study movement. Observation provided data on the users' body language, on group dynamics and on how Point-of-view was used in the MbDP. We analysed the MbDP by observing what the users are doing. Hence, we cannot distinguish whether insights were created from the past, present or future tense.

Both workshops were video recorded using wide-angle lenses, encompassing the relatively large area the users designed in, to access details which would otherwise elude our senses and to provide details in social interactions (Heath et al., 2010). The observations revealed two themes. The collaboration between the users was different than planned, and the use of tense was hard to grasp in situ. We explored these themes in semi-structured interviews with five users.

3.3 Video analysis

Transcription of video recordings and the analysis that followed were informed by Heath et al. (2010)'s threestep protocol for reviewing video material. We started with a preliminary review and catalogued the video by transcribing basic activities. We then performed a substantial review looking at distinct phenomena. The organisation of the users' process was further characterised through Svanæs & Barkhuus (2020) framework. To gain insight into the tenses, we interviewed users from each workshop.

3.4 Interviewing users

The purpose of the interview was to create a conversation that invited the users to share accounts of their experiences (Smith & Sparks, 2016). We prepared two pieces of observation footage for each interview and presented the footage to the users. Afterwards, we asked each user to elaborate on what happened in the video. The footage represented a situation where the user did something of interest, e.g., if the user went from working alone to working in a group or played with or presented an artefact for the group.

We analysed tenses by combining the empirical material from the interviews with the suggested characterisation of Point-of-view from video footage.

4. Design cases

The first design workshop was created in collaboration with KOMPAN (a Danish company designing playgrounds and outdoor fitness equipment), and the second workshop was created for The European Conference on Game-Based Learning 2020 (ECGBL2020).

4.1 Designing next-generation outdoor fitness equipment

We were asked to help design Kompan's future playful outdoor fitness equipment. SDU students and designers from the company were divided into five groups (25 participants in totalt); the authors participated in two groups. The company emphasised that the concept must include both a "fun" and "exercise" value and have a

diverse appeal regarding age, gender, weight, and skills. The target group was men and women aged 15 to 50 years. Five mock-ups of outdoor fitness equipment were produced.

4.2 Designing technology-based exercise games

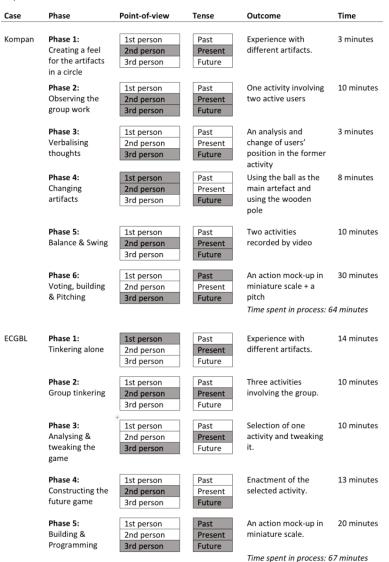
As part of ECGBL2020, we organised a hybrid workshop in which online and physical participants collaborated with attending professors and Sport Science students from the local university (20 participants in total) to ideate and make technology-based exercise game prototypes. The workshop ended with two technology-based exercise games, which were reflected on by the participants.

5. Point-of-view and Tenses in Movement-based Design Processes

5.1 Analysis outcome in short

The analysis of our Kompan workshop and an ECGBL workshop uncovered how users utilised Point-of-view and tense (marked in grey). An overview of the process analyses is presented in Table 1. The process phases are visualised by associated Point-of-view and tenses, and states outcomes and allocated time in the workshop.

Table 1: Each workshop with associated Point-of-view, tense, outcome, and time



6. Case 1: The next generation of outdoor fitness equipment

The scope of the workshop was to create new ideas for Kompan's next-generation outdoor playful fitness equipment. The group was placed on and around a steel bridge built with webbed rope (See Figure 1).

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Figure 1: The bridge of webbed rope

6.1 Phase 1: Creating a feel for the context and artefacts

The group gathered at the bridge (See Figure 1) and utilised the 2nd-person perspective to gain new ideas from observing and responding to each other's movements (actions) in the present tense. As one user of the group recalls during the interview: "We just got on the same wavelength and vibes together without much talking". Phase 1 ended with the users moving toward the bridge after having created a feel for the artefacts in 2nd-person – present tense.

6.2 Phase 2: Observing the group work

Phase 2 consisted of two different activities being developed. The users placed themselves under the bridge in two smaller groups. One group is observing, and one is moving. Phase 2 was an equal mix of 2nd and 3rd-person perspectives. The movement was done by two users playing and sharing insights in a 2nd-person perspective, while three users observed the activity from a distance in a 3rd-person perspective. The observing users are seen in the video footage introducing themselves to the activity via artefacts and changed from 3rd-person to 2nd-person. The moving users tinker with the activity as it progresses while working in the present tense. Alongside the users working in 2nd-person – present, the observing users work in 3rd-person – future as they observe a future activity being played. The observing users analyse the moving users using the 3rd-person – future to evolve the activity into a "better" fit for the situation. Phase 2 ended with one activity physically involving all users.

6.3 Phase 3: Verbalising thoughts

In phase 3, the group utilised the 3rd-person perspective – future tense by verbalising tweaks to the activity. The verbalisation is a way to create a distanced standpoint using 3rd-person perspective. The group passes the ball to each other in a volleyball style—passing, enacting a future ballgame, and using future tense. Phase 3 ends with two users standing on the bridge catching the ball, having also recorded their own activity.

6.4 Phase 4: Change of artefacts

During phase 4, the activity develops from revolving around a ball and tinkering with a wooden pole. The group uses 2nd-person perspective mixed with 1st-person perspective to redefine the activity. The process has a few active users moving and being in 2nd-person – present in the main activity. While some users played with the ball, one user tinkered with the wooden pole in the background, creating a feel of 1st-person – present. The wooden pole is introduced to the users standing on the bridge, which changes the activity. Phase 4 ends with having changed the primary artefact from using a ball to using a wooden pole.

6.5 Phase 5: Balancing & swinging

Phase 5 consisted of two activities, one person crossing the bridge and another working through the bridge. Having introduced a wooden pole, two users are observed holding the wooden pole with rope moving across the bridge, working in a 2nd-person – present and future perspective. The activity evolves as the group verbalise thoughts involving both moving and observing users. Tweaks are done as the balancing activity progresses, such as waiting to throw the ball to help the two users balance and not throwing at full speed.

The users create a future activity while observing each other enacting the activity. Having recorded the balancing activity, two members lie down on the bridge and stick their arms through the braided rope. This second activity was created utilising both 1st and 2nd-person perspectives, as one user recalls in the interview, "There were these holes, and we can actually lie down on the braided rope". The user had created a new feel by lying down. Another user mentions a "common feeling of the situation" in the interview. This user imitates the user lying

down and, in turn, creating the next activity. In this activity, the users lie down, hold the wooden pole, and swing it back and forth. The users had developed a solution by sharing experiences and creating a shared feel of here and now applying a 2nd-person perspective – present tense. Phase 5 ends with the group having recorded videos of two developed activities (one from phase 2).

6.6 Phase 6: Voting, building prototype & pitching

The last phase consisted of three design methods: having the users watch recorded solutions, create a mock-up, and pitch their final solution. The users applied a 3rd-person – past perspective by watching themselves on the recorded video. From a distance, the users analysed the best solution without the need to empathise with movement. One user mentions this distance in the interview by saying, "The concept looks different on video."

When the group builds the mock-up, the work continues in the 3rd-person perspective having to work with objects such as DIY-material like paper, tape, and glue. The users we observed were working on creating an object and a pitch, which would help the group explain their solution to others working in the future tense. Phase 6 ended with all the groups presenting their solution to each other.

7. Case 2: The creation of technology-based motion games

The aim of this workshop was to create technology-based motion games as part of an embodied workshop.



Figure 2: The context in which the process occurs

7.1 Phase 1: Tinkering alone

In phase 1 the users started by working alone to get a feel of a self-chosen artefact. The users move with, on and over their chosen artefact in the context (See figure 2). Working separately, the users create a feel, right here and now for themselves, being in 1st-person - present. Phase 1 ends with one user gathering three hula hoop rings and pulling the rope through them.

7.2 Phase 2: Group tinkering

Phase 2 had three different activities from the 2nd-person perspective. The group shared insights from the previous phase and created an activity resembling tug-of-war over two hurdles with a hula-hoop ring in the middle. The users empathically observed how each user responded to the "dangers" of the wooden ring and changed to a plastic ring working from insights created in 2nd-person - present. The group subsequently moves around, helping each other get the hula-hoop ring to pass the metal bars (See Figure 2) while utilising a 2nd-person – present perspective. The activity evolved a third time keeping the mechanics of moving as a team. The group is observed to pick up a wooden baton and hold it between two users while manoeuvring across the context holding the baton in their hands, connecting the two users. This last activity of phase 2 also utilised 2nd-person – present. Phase 2 ends with the group continuing their work with wooden batons.

7.3 Phase 3: Analysing & tweaking the game

Phase 3 consists of a group discussion utilising a 3rd-person perspective. Due to time constraints, two participants leave the process. The group proceeds with their work on the baton game from phase 2. The group verbalises ways of tweaking the activity from a 3rd-person perspective. After a conversation, one user walks to the metal bars and asks, "Should I just try and walk it?" The other user responds, "either go over or under, just go under", to which another user says, "go to the one behind him". The group utilised a 3rd-person perspective as they analysed the games witnessed. They talk about the game as it happened in the past. The focus of the

conversation is to change the form of the game, here and now, thus utilising present tense. Verbalising the game by talking about whether to walk under or over the obstacle, the group continues work in 3rd-person – present, analysing the game as it proceeds. Phase 3 ended with the group having selected one activity and tweaked it.

7.4 Phase 4: Constructing the future game

Phase 4 consists of playing and recording an activity. One user is observed placing mats, sprint blocks, and discuses, while the other user moves around in the metal bars near the placed artefacts. The users act, talk, do movements and tinker while placing the artefacts. They utilise the 2nd-person – future perspective, thus enacting a possible future together. Afterwards, the moving users return to the start and ask, "Okay, guys. How did it look? I think we need to try with another team." As facilitators, we are invited to try the activity as the opposing team to the two users, enacting a future scenario utilising 2nd-person – future. Phase 4 ended with the group recording a video of the physical learning game created with the facilitators participating.

7.5 Phase 5: Building & programming

Phase 5 consists of three design methods: analysing the game, building a mock-up, and starting a computational thinking process. The group analysed the recorded video of the activity with the intention of building and programming the game into an action-mock-up (a small-scale replica of the game with functioning technological sensors and actuators). The group utilised the 3rd-person – past perspective by analysing the activity for changes. While making the mock-up, the group employed present tense as they analysed the object(s) here and now. Future tense was utilised while enacting the activity via the mock-up. Phase 5 ended with a group reflection on the process, having built a mock-up.

8. Concluding remarks, learning points and recommendations

In the following section, we conclude and provide discussions and recommendations looking further into the use of point-of-view and tenses for future movement-based design processes.

Analysing the two movement-based design processes through the lenses of Point-of-view and tenses helped us understand how the perspectives had been used in designing with movement.

Generally, both 1st, 2nd and 3rd-person perspectives have distinct qualities used in distinct design phases in the design of playful fitness equipment and in the design of exertion games. The 2nd-person perspective we observed being used when the design participants were designing solutions including more than one user and through their sharing of insights. Working in 1st-person creates insights that had to be shared to evolve. In the Kompan workshop, the 1st-person perspective was used to introduce new ideas to the group. In the ECGBL workshop, the 1st-person perspective laid the foundation for the 2nd-person perspective. In both workshops the 3rd-person allowed the users to distance themselves to analyse the situation.

In both workshops past, present and future tenses were utilised. The Past tense was mainly used to look at suggested solutions by watching recorded videos in both workshops. Present tense was utilised in almost every phase of both workshops and seemed to be the main tense in which the users worked. Future tense was mainly used towards the end of the ECGBL workshop as the users had already designed some of the work. Whereas, in the Kompan workshop the future tense was present from phase 2 until the end of the workshop.

In reflecting upon our work, we see that Point-of-view and Tenses has been an implicit part of our movementbased design processes. We now recognise the value of using Point-of-view and Tenses in working with movement-based design activities. As such we will explicit use Point-of-view and Tenses in future movementbased design processes and in the following section we present our recommendations.

8.1 Start and stay in 1st person.

In future workshops, we recommend utilising the 1st-person perspective more extensively, thereby ensuring insights created is from a felt, lived experience based on current and past experiences when designing for sustainable movement. In the Kompan workshop, 1st-person Point-of-view was used sporadically, while in ECGBL2020, we utilised 1st-person to a larger extent before sharing knowledge. In their paper on Moving and Making Strange, Loke and Robertson (2013) use 1st-person perspective in three out of seven steps, making this perspective a larger part of their design process than we did in our MbDP. Focusing on 1st-person perspective ensures that the essential felt and lived experience of movement is considered in future design (Loke &

Robertson, 2013). Likewise, Tomico et al. (2012) argue that utilising 1st-person perspective provides a commitment and intrinsic motivation; thus, design participants gain a sense of responsibility for the process.

In both workshops, we began the process by utilising 1st-person perspective, having the users work alone and with their own approach towards artefacts in the given context. Much like Loke & Robertson (2013), the users quickly move from 1st-person onto 2nd-person, only returning to 1st-person sporadically. Having used the 1st-person perspective more extensively in the movement-based process could have benefited from the intrinsic motivation and the users' commitment to a larger degree.

8.2 Let the group work together but...

We recommend using 2nd-person perspective in more than one design phase. The sharing of insights is valuable and exchanging information between users provides opportunities for evolvement of the design (Tomico et al., 2012).

In the interviews, participants expressed a sense of excitement upon working together. Segura et al., (2016) point toward the value of embodied design as creating high engagement, arousal and positive emotions when working together by shaping space to support mutual orientation, awareness, and communication. In both workshops, the groups tended to go back and utilise the 2nd-person perspective working collectively. Each time a group worked in either 1st or 3rd-person, they would return to share their knowledge with the group.

This sharing of knowledge was done in three ways: 1) participants verbalised their insights to each other to evaluate, 2) participants evolved the past activity and 3) members of the group let go of their activity and joined up in pairs or, as a whole group, gave up their own work. However, Loke and Robertson (2013) and Segura et al., (2016) recommend utilising 1st-person perspective before sharing insights to ensure that the essential felt and lived experience of movement is considered. This could be done by making sure to separate the participants in the facilitation.

8.3 Let the participants distance themselves

Like Segura et al., (2016) movement-first approach our recommendation for the future movement-based design process is to utilise the 3rd-person perspective in the last part of a workshop to create a distance between the users and their proposed solution as late as possible and to facilitate as much intrinsic motivation as possible.

Utilising the 3rd-person perspective users can distance themselves from the process by analysing the others. In our workshops, this was done either by verbalising their thoughts or commenting on movement as it unfolds to make it better. According to Tomico et al., (2012) the 3rd-person perspective can provide a holistic view of the situation by having the users distance themselves and look objectively at their solution.

8.4 Tense in movement-based design should be clear

We recommend future movement-based design processes make the purpose of tense clear for both the users and the facilitator creating the process. Thus, designers should make more conscious choices as to when insights should emerge. Past tense supports insights usually taken for granted and makes them mouldable for the design process. Generally, the design process is seen as a discipline oriented toward the future that rests on the conditions of the past (Soro et al., 2019). When users work with the interplay of future and past, they is explore a feeling of here and now, working subconsciously with their own past experiences while trying to define the future (Svanæs & Barkhuus, 2020).

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