

# Wagging<sup>1</sup> the Form Baton<sup>2</sup>: An Analysis of Body-Movement-Based Design Patterns in Nintendo Wii Games, Toward Innovation of New Possibilities for Social and Emotional Experience

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## ABSTRACT

In this paper, we present an analysis of body-movement design patterns in Nintendo Wii games, toward innovating new possibilities for social and emotional experience.

## Categories and Subject Descriptors

H.1.2 Human Factors

## General Terms

Design, Human Factors.

## Keywords

Body-movement-based design, video games, social and emotional experience.

## 1. INTRODUCTION

The Wii gaming platform, released in December 2006, has been lauded in the gaming community and in the popular press for introducing physical play to a broader gaming audience [7]. Attention has been devoted to the health benefits of the additional movement, and the value of the platform to nontraditional audiences such as senior citizens, but there has not been systematic and detailed analysis of the kinds of design choices that are being made in crafting game gestures themselves.

Recently, researchers in the CHI community have begun to conduct studies demonstrating that physical games increase engagement [1] and social interaction [8]. These studies point to general effects based on presence or absence of body movement in gaming, but do not dissect at a finer-grained level of detail what sorts of motions create what sorts of effects and why.

Our research approach is to use an understanding of social psychological and communication findings about sociality and emotion as a lens for better understanding how specific design choices can impact players [5]. In the present project, we are working to create a taxonomy of the sorts of body movements and gestures employed in popular and well-regarded Wii games, toward building a more detailed understanding of what

seems to be effective and why. In particular, we are interested in which sorts of movement mechanics create social and emotional engagement and enjoyment for players.

Game designers have known for many years that engaging the whole body in thoughtfully crafting game mechanics can lead to powerful social connections and positive emotional experiences [3; 10]. In recent years, game studies scholars [2] have begun to articulate a framework for understanding how game mechanics can promote certain beliefs and worldviews. It is our belief that game designers can consciously craft whole-body interactions that encourage social and emotional engagement and connection, and we are interested in uncovering any existing patterns along these lines toward advancing them in our laboratory with our own game mechanic explorations.

## 2. RESEARCH STRATEGY

We are examining games that have been best sellers and/or well reviewed by the gaming press. We have also asked Wii developers (such as the Producer of Boom Blox at Electronic Arts) to recommend games with interesting movement mechanics that we should examine.

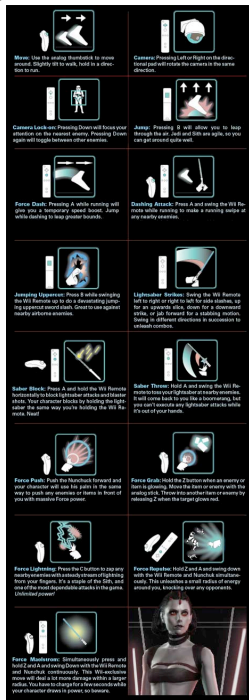
The first-wave list of games includes: Wario Ware Smooth Moves, Mario Party 8, Boogie, Star Wars: The Force Unleashed, Metroid Prime 3: Corruption, Wii Sports, Super Mario Galaxy, Super Monkey Ball: Banana Blitz, and Okami. The games represent a mix of genres—rhythm games, party games, and action/adventure games.

For each game, we are using a combination of user manuals, web-based walk-throughs and press explanations (e.g. Figure 1b.), and play of our own, to create a list of the movement-based mechanics in the game. Then we make notes as we play, about each movement mechanic. We describe how the particular mechanic fits into the overall game feel, goals, backstory, and any underlying rhetoric that can be discerned (using Bogost's notions of procedural rhetoric). For example, here is a brief initial description of a specific movement-based mechanic. In Star Wars: The Force Unleashed, you can fling an object or a person to the ground, using a hurling motion with the nunchuk part of the Wii controller (typically held in the left

<sup>1</sup> Wagging is a derogatory term for swinging the wiimote back and forth as a game mechanic, e.g. when handling the light saber in Star Wars: The Force Unleashed.

<sup>2</sup> Wario Ware Smooth Moves christened the wiimote the 'form baton' in their humorous instructions to players about how to hold it in various positions to execute gameplay maneuvers (see <http://www.youtube.com/watch?v=ab4dse9AMPM>.)

hand, see Figure 1a). This motion feels forceful and aggressive, and represents one of the fantasy powers that Jedi Knights have in the Star Wars universe—to use ‘the force’ to act on the physical world. Using the nunchuk for this mechanic allows the player to focus the wiimote main controller (held in the other hand at the same time) movements on the operation of his/her light saber, a primary combat weapon in the Star Wars universe. Interestingly, in the films themselves, hurling people to the ground is a mind-powered activity, requiring no physical movement at all. But in the game, using a forceful movement of the nunchuk seems to amplify and make more satisfying the exercise of this particular power.



**Figure 1. The Wii controller (a.) consists of the ‘nunchuk’ (on the left) and the ‘wiimote’ (on the right). (b.) GamePro online included this player control taxonomy in an article about Star Wars: The Force Unleashed (see <http://www.gamepro.com/article/previews/173628/star-wars-the-force-unleashed-page-3-of-5/>).**

We are working toward generating a bottom-up set of dimensions and characteristics of the mechanics, that can help us build a foundation for exploring heightening social and emotional engagement and enjoyment through designing our own mechanics, or combining and extending those we’ve observed.

### 3. SOME PRELIMINARY ANALYSIS

The analysis work is ongoing and not yet complete, and the extended taxonomy of movement mechanics would not fit into this position paper format. Here are a few preliminary

insights from the analysis process. The plan is to bring the completed analysis and insights to the workshop itself, to share with colleagues in this area.

### 3.1 Kinesthetic Mimicry

(see [http://onlyagame.typepad.com/only\\_a\\_game/2007/01/kinaesthetic\\_mi.html](http://onlyagame.typepad.com/only_a_game/2007/01/kinaesthetic_mi.html) for a nice overview of what this term means and its history in computer gaming). This represents an overwhelming majority of the movement mechanics in the games we are analyzing. Movements such as pulling a block carefully out of a pile (Boom Blox), shaking ants off of a banana (Wario Ware), clapping and other hand-based dance movements (Boogie), were very common among the games examined thus far. This makes sense, given the positioning of the Wii platform as something that allows you to feel as if you were really there, to be more immersed in gameplay through simulation. (For a discussion of the dangers of this approach, see <http://avantgame.blogspot.com/2007/01/wii-warning-do-not-simulate.html>.) Some games create very humorous effects by using a realistic motion in a surreal situation. For example Wario Ware Smooth Moves, in which you pluck a nose hair from a nose or use a hand fan to blow enemies off a mountain top, makes the player laugh in response to executing a real world action in a ridiculous fantasy context.

### 3.2 Piecemeal Versus Full Body Motion

It is rare to find movement mechanics that flow seamlessly and effortlessly in a full body manner. Wii sports is a notable exception—the boxing, tennis, and bowling games all seem to elicit more smooth, full body motion from player (see for example this videoclip posted on Youtube:

<http://www.youtube.com/watch?v=TvHrF0cpx7o&mode=related&search=>). More common are part-analogs, such as waving one’s hands to the beat in a particular pattern (Boogie), without regard to what the feet are doing, or holding down a button to pick up someone and then fling them using movement (Star Wars: The Force Unleashed). In many cases, the game mechanics combine button presses with movement, which mitigates the feeling of full body absorption.

### 3.3 Tensions Between Precision and Loose Movement Style in Design

The traditional console gaming paradigm is precise control, using joysticks and button presses. Introducing the wiimote opens the possibility for looser movements as game actions, and it seems that designers are still grappling with how to combine these two paradigms in crafting game mechanics. The casual and party games that we have been analyzing include more novel, loose movement-based mechanics, whereas the games in adventure/action categories often combine loose and more precise, traditional control schemes, with varying degrees of success. These issues come up in reviews of games in this genre.

### 3.4 Much Room for Innovation in Game Mechanics and Their Relationship to Social and Emotional Experience

One example of the potential: some games we’ve played have cooperative modes, but none has a control scheme that makes use of interpersonal distance and coordination using one controller, an experimental mechanic that we plan to prototype. Also, there is little use of the potential for the physical feedback loop (emotion incitation through movement mechanics that

invoke movement by the player that normally accompanies the target emotion—see [4]). This is a design possibility that we have already begun to explore in our group [6].

#### 4. CONCLUSION

This close analysis of existing movement-based game mechanics in commercial Wii games should provide valuable insight to those interested in designing whole body interactions. Our lab group will use this analysis to aid in the evolution of a design pattern language for movement-based game mechanics, and to push the envelope with our own movement mechanic prototypes. We imagine that these explorations may also be of value in broader HCI contexts, such as the development of interaction schemes in virtual worlds or with accelerometer-enabled mobile devices. We are looking forward to attending the workshop and sharing our insights with those interested in advancing the state of the art in whole body interaction.

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