Break the Game: A Practice-based Study of Breaking and Movement Design in Video Games

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ABSTRACT

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As players go through a circular pattern of experiencing games they pass through: observation, interpretation, hypothesis making, decision-making then finally acting upon decisions. Their successes and failures help the player construct an understanding of the game world, and as a result increases their confidence in their ability to make informed decisions when faced with *game play* challenges. In order for a player to be emotionally absorbed by the game's story they must be fully immersed in the action. In order to achieve this, all aspects of the game must reinforce the narrative design and sculpt a world in a way that makes the player feel as if they were living in the shoes of the character/avatar. When successfully applied this allows the player to have an emotional experience at which point they are more likely to fully invest in the story of the game through autonomous, authorial, and asynchronous play. This thesis proposes that the control scheme design for games with gesture interfaces which require a more global embodiment from the players should actively reinforce the narrative and in so doing reflect the feel of the game more completely.

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Qualifying myself as an insider in Breaking:

"B-boys and B-girls are people who are attracted to a practice that they view as complex and powerful and sophisticated and spiritual." (Schloss, Foundation 156)

I have been a b-girl for over fifteen years and have maintained a consistent, focused practice as a breaker and choreographer. I have judged battles at prestigious international events and toured my dance company of b-girls and our breaking-inspired choreographies to international urban arts festivals. As a soloist/dancer I have battled and trained extensively both nationally and internationally. To give back to my community, I organized large-scale breaking events and ran a dance studio for seven years that served as a hub for breaking in Montreal.

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Abbreviations

GUI is a common shortening of the term graphic user interface and refers to the graphic interface the user interacts with that is the bridge between them and the game.
UI user interface
NPC is a common shortening of the term non-player character that means any characters in the game not controlled by the player, but ones the player interacts with.
DC Dance Central
JD Just Dance

Glossary

Breaking is the dance of break-dancing or b-boying as it's also commonly understood. In my thesis I have decided to use the term *Breaking* instead of *break-dancing* or *b-boying* for two reasons, one because breakdancing is generally considered a term coined by the media and is not what the form is known as within the culture; and two, by excluding B-boying the form remains gender neutral. There are excellent researchers wrestling with gender in breaking but this discussion is outside the scope of this thesis.
Breaker is a person who dances break-dance that also upholds a tie to the larger break community.
B-girl or b-boy a female or a male breaker used interchangeably with breaker
Battling is a competition and there are several different kinds of battles such as: one on one, two on two, crew battles, seven to smoke, bonnie and clyde etc…
Gesture games, or movement games are video games developed for specialized consoles with controllers that use more natural movement

Chapter 1: Introduction

A brief history of Breaking

Breaking was created by African American youth in the Bronx, N.Y., during the late 1960s and early 70s. However it was soon adopted by Puerto Rican youth who embraced the form and helped develop it into the global phenomenon it is today. At that time, young people living in Bronx were searching for positive ways to express themselves within a climate of gang warfare. Music and dance became their much-needed outlet and hip-hop music and breaking evolved out of the ashes of this overlooked and unsupported neighbourhood.

Kool Herc is widely credited as the founder of hip-hop music, which greatly influenced budding b-boys/b-girls to expand and develop their dancing vocabulary in parallel with the evolution of the musical form.[1] In an effort to stop the violence in the Bronx, Afrika Bambaata, one of the three 'Kings of Hip-hop' created the Zulu Nation. "Movement was literally at the heart of the organization, in the form of the Zulu King dancers and later on the Zulu Queens", as Chang expresses in his book Can't Stop Won't Stop, "Zulu Nation was returning the Bronx to an era of style, celebration and optimism." (Chang 101) However, even though the emerging Hip-hop culture was bringing 'style, celebration and optimism' to the neighbourhood, from outside the culture the participation in the hip-hop arts or lifestyle was often misunderstood and viewed as deviant behaviour.

Breaking and street dance in the media

The mainstream movie *Flashdance* is an early example of breaking represented in the media and while heralded within the global Break community as important to the spread of hip-hop worldwide only two minutes of the film featured breaking performed by members of the Rock Steady Crew.

Recently another slew of films with a renewed fever for street dance have been released. The films pit formal codified forms like ballet and contemporary

dance against street dances/breaking and usually within a narrative involving a love story between dancers from opposite 'sides of the tracks' – the street dancer's role nearly always portrayed by a man and the formal dancer's role by a woman. This storyline is a non-critical reiteration of the argument over the validity of street versus formal dances as well as a formulaic gendering of the forms. The movie *You Got Served* was marketed as a narrative about 'breakdancing' and yet the scenarios represented are far-fetched and culturally inaccurate. Of importance in this example is how the styles of dance under the banner of hip-hop were misconstrued; the term 'breakdancing' is often problematic because it has become a media diluted, umbrella term that incorrectly includes popping, locking, electric boogaloo, all of which are *funk styles* that were developed separately (Schloss 60).

Hip-hop dance is also a term that is often used when speaking about breaking and while both are rooted in hip-hop culture, they are each unique, and wildly different forms (it's like equating jazz dance to tap).

In much the same way b-boys and b-girls are very protective of the title given to practitioners of their dance and culture. In order to be a b-boy or b-girl one has to do the foundational movements of the dance: top-rock, footwork and freezes (defined later), as well as demonstrate a general investment in the culture. This represents the essentials of calling oneself by this title (Schloss 60).

When compared historically to rap music, Breaking and graffiti are notably absent from mass media, as Joseph Schloss wrote in *Foundation* "B-boying was an advertisement with no product"(5). He goes on to say that academic scholarship often focuses on Hip-Hop through the lens of mass media, however true "B-boying doesn't really exist in the mass media"(Schloss 9). The differences between how practitioners of this dance *experience it* and how the mass media *represent it* are vast. He also points out *Breaking is something that needs to be experienced*; Breaking vernacular is physical and it must be danced in order to be understood, the term 'hip-hop culture' also suggests something that is lived rather than bought and sold (Schloss 5). Gesture video games have made it possible to create a dance

product although the experience of dancing in such games is still far removed from the lived experience.

Commodification of street dance

Hip-hop fosters diversity, and competition is inherently understood as an open call for critique especially from within the culture itself; that is what battling is all about. It's a demand to have your work taken seriously by testing it against the work of others (Schloss 3). A reflection of mass media's ongoing relationship with urban dance are the many reality television programs about dance competition. Often solo hip-hop dancers, breakers (among dancers of other styles) or full crews showcase their talents to win a prize. This trope, of the dance crew striving for a grand prize, has existed in the narrative of dance films for quite some time but now has become wildly popular on television as a consumable format.

Reality television shows, such as America's Best Dance Crew, regularly feature hip-hop and breakers engaged in competition, but here competition is not a call for critique in the same way as in hip-hop culture. The battle between contestants on this show is less about strategy, musicality, freestyle, and execution, which is what street dance battles are usually about (especially in breaking) and more about entertainment value.[2] Even though there is a precedent in the European breaking scene for the judged showcase as a system for eliminating contestants[3], the format of ABDC, while showcasing b-boys and b-girls, deviates from the parameters of the cherished cultural forum of the breaking battle.

Another new advent in dance commodification is dance video games. What these television shows and video games have effectively done to *street dance* is distance them from hip-hop culture (the lived experience) for the purposes of accessibility, distribution and creating a fetishized sellable product.

Biting and the recipe for imitation learning through media

In Rap music, sampling bits of music or lyrics is normal practice and is generally seen as a way of paying respect to the older generation artists. This

ideology trickles into b-boying where the ethics of sampling are governed by the concept of biting. In breaking**,** biting or to bite, essentially means to take someone else's intellectual property, in this case someone's dance move(s), but it can also be thought of as a citation, when applied correctly.

The popularization of breaking in the media, and readily available video footage courtesy of sites such as YouTube have contributed to a shift in how the next generation of dancers learn. Nowadays budding breakers have access to an endless supply of videos online, featuring b-boys and b-girls from around the world. While video footage have been an essential method of learning and global distribution of this form the proliferation of media materials has increased the likelihood of the appropriation of intellectual property, in the form of an individual's dance movements, being learned verbatim by another dancer. Learning verbatim, or biting, is considered a problem because breaking places so much importance and value on personal style. Performing imitated moves also contributes to a codification of the dance form and a collateral 'snuffing out' of creative evolution - the foundation upon which this form was built.

Biting, or plagiarism, has several ethical guidelines. To make a 'bite' acceptable, credit should be given to the person from whom it was learned and to the originator of the movement, *if those people are not the same*. B-girl Rockafella, in the book *We B-girlz*, refers to this as 'payback' that is due to the communities where the dance originated (Cooper, Nika and Rokafella 10). Also if someone comes into a community to learn *breaking* it is considered inappropriate to just take the knowledge and leave without giving something back in exchange.

On the other hand some practitioners believe that everyone is a 'biter' or that there is no such thing as a biter in the sense that it's an accepted method of learning and passing on information from generation to generation (Aby and Ness). It should be noted that Aby and Ness made sure to qualify their statement about biting by saying that once a move is learned, the dancer must then modify it in order to make it 'their own'.

In the beginning there were no formalized *breakdance* classes, instead an informal pedagogy based on peer-to-peer or mentor to student approach was embraced. As a result students preserved the legacy of their mentor/teacher by performing their moves and emulating their style and dance philosophy.

Today it is generally deemed acceptable to *bite* as a way of learning a new movement, however, as stated earlier, after it's been learned the dancer has a responsibility to change it somehow to adapt it to their style so it is no longer identical to that of the person they learned it from, lest be accused of *stealin*g from another dancer. It is at this point where media becomes particularly culpable. The proliferous nature of biting in today's climate of readily available media has muddied the transactional exchange of paying tribute to where, and who, you learned from. The distancing effect of mass media also removes much of the risk of being called out for biting by a fellow dancer. In this way technology also contributes to the codification of improvised dance forms by recording and thereby allowing replaying and repetition.

Codification and Commercialization

Over the years I have noticed a change in how the newer generations of breakers are dancing; a trend Jacob Lyons, B-boy Kujo, calls the YouTube style:

> Everybody watches the same videos online and everybody ends up looking very similar…It used to be that you could tell what city a B-boy was from by the way he danced. Not anymore…most people don't listen but continue watching the same videos and dancing the same way. It's what I call the 'Youtube style' (Bboy Magazine).

While the use of distributed media such as YouTube, movies and games as a learning tool has contributed to a globalization of breaking, it is also responsible for changing what the dance is about.

In 2006 B-boy Storm of Battle Squad crew, released an instructional video to teach footwork fundamentals as a reaction to what he encountered as he toured and taught internationally. On his website, Storm says he noticed people were missing important parts to their dancing and didn't understand the true nature of the dance, rhythm and proper execution of fundamental moves (Robitzky).

Storm's response to the newer generation's dancing can be seen as a push back from an older generation breaker laying down a claim for authenticity. Ian Condry also cites a similar example when original Rock Steady Crew member and current president, B-boy Crazy Legs, visited Japan to judge a battle and perform. "Crazy Legs offered a critical response to the battles...He was not completely happy with what he had seen. Crazy Legs thought there had been too many 'power moves' and not enough attention to footwork" (67). Breaking was introduced to Japan through films and Condry went on to say he felt in that situation "respecting the pioneers was trumped" by what it took to win the popular vote of the audience (67). The efforts of these two *breakdancing* pioneer's, to align the newer generations with the foundation of breaking, seems to be losing the battle against the powerful influence of media, which reinforces the disparity between the generations of breakers. In my research I look at how dance video games, through their design and interfaces, contribute to a fetishization of street dances through physical imitation of cultural signifiers. I argue that the way breaking is portrayed in video games is a reiteration of the way dance is misrepresented in most films and reality tv shows and point out the ideological gaps between specific dance games as informed by my practice as a b-girl.

Dance video games

In my thesis research I focus primarily on the subcategory of dance gaming, primarily for the Xbox Kinect, although some other relevant examples are used. I analyze mimetic interfaces and the role player imagination plays with the aim of sussing out problematics surrounding imitation as learning especially when game narratives cross the boundaries of cultural misrepresentation. I also attempt to

qualify choreographies in dance games as ergodic texts[4] and why playing dance games might be more aligned with reading dance than dancing. Considering this as a design problem, I am inspired by the inherently competitive and improvisational structures of breaking to find ways to depart from mimicry and strict choreography. Thinking about movement from the perspective of street dance also helped me to understand the state of simultaneously being choreographer and dancer and how I might elevate dance-game players from embodied readers to the equivalency of co-authors. I explore these ideas using my dance practice, relevant literature, a close study of commercially available dance games as well as practice-based research into choreography in games

My first experience working in video games was in 2007 when I was employed as a choreographer on Boogie Superstar, a Nintendo Wii game produced by EA. My job entailed suggesting choreography influenced by dance styles that were currently popular. However I was not included in the final decision of what movements would or would not be in the game or on the sequencing of the 'choreographies'. As a result final gameplay felt frantic, the movement phrasing and rhythms disjointed and the animations stiff.

How the dance elements and the game elements were combined failed to achieve player immersion because too many of the game mechanics required breaking from the dance script. Movements unrelated to the dance such as: to shake the controller vigorously, circle the controller while held high in a 'lasso" type movement; or point to the side, up or down to win points and achievements, made the experience feel disjointed and pulled the player's focus too far away from the feel of dancing. Needless to say Boogie Superstar was not a super hit but it did inspire me to think about how I could more constructively use my knowledge as a dance professional in game development. Player movement is integral to all game play as it links the real world of the player to the virtual world of the game through the controller – both a traditional controller as well as gesture controllers (Kirkpatrick, Controller, Hand, Screen: Aesthetic Form in the Computer Game 136) -

it seems appropriate therefore for movement professionals to be more involved on design teams especially those tasked with producing digital movement games.

Gesture video games are designed to have easy learning curves and broad appeal, they also boast a player demographic ranging from the very young to the very old. Commercially available games in this category are generally defined as games made for the Nintendo Wii, Xbox Kinect or Playstation Move (although recently some movement games have been designed for mobile platforms). The birth of these specialized controllers successfully demanded a more global embodied commitment from players by utilizing mimetic/imitative, or natural movement control schemes. With the added benefit of these controllers being considerably more intuitive, thanks to the closeness to already familiar movements, games for these consoles are generally heralded as being easier to learn and to play than say games that require navigating a multi-buttoned, handheld controller. Imitation interfaces are also deemed to be better and a more efficient method for learning skills that may be transferrable to real life (Jenson and de Castell 5)

In partial fulfillment of my degree requirements I have developed the initial parameters for a position I call, *Movement Designer*. Since Boogie Superstar I have worked on a handful of video games under this title, focused on movement analysis, interface and control scheme design as well as in a secondary role as dance consultant. The projects I undertook in order to complete the practical portion of my degree were all part of a process meant to test my movement design concepts for video games.

In this section I have laid out some of the research problems in how breaking was being represented through new media focusing the scope of my study on the medium of dance video games. In the following chapters I will analyze dance in video games and gesture towards methods that fill in the gap in the production of dance games, as I see it, with the job of Movement Designer. Chapter 2 discusses my methodology of practice-based research. I offer detailed case studies of a game design internship and my approach to breaking freestyle, developed from years of

training as a b-girl and teaching at my dance school *Studio Sweatshop*. Chapter 3 will go through a close reading of two games, *B-boy* and *Dance Central* with reviews of relevant literature on mimicry in games, notation as performance, hypertext and authorship in games. In this section I elaborate on my research into breaking as a form and expand on how popular media has traditionally misrepresented street dances. Chapter 4 will discuss my four design projects, *Hacking DC, Dance Karaoke, Game Choreography,* and *The Cipher Game* and their relevance to the fields of games and dance and conclude this chapter with an account of my professional work as a movement designer in the games industry.

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[1] B-boys and B-girls would primarily dance on the break of the song. Kool Herc developed a method of using two of the same records to continuously bring back the break thereby prolonging the time during which the breakers would dance.

[2] A typical choreographic challenge is on ABDC would be promotional throwbacks to other forms of popular culture such as emulating popular music videos from the past decade or choreographing to a hit pop song.

[3] Battle of the Year, one of the longest running Break battles in started in Europe and since the beginning has featured a showcase to eliminate crews down to the final four. It is now common practice for European break events to host performances alongside battles but has only recently become part of some North American break events and is still rare. Interestingly in the film Planet B-boy, a documentary about the 2006 BOTY, one of the organizers suggested part of the initial reasoning behind doing shows as the battle was to encourage B-boy crews to make choreography so they could better market themselves to make money as dancers. The movie "Battle of the Year" was based on the documentary of BOTY competition and the narrative insinuates the event was started in the USA rather than in Europe. A clear misrepresentation of the history of the event.

[4] Ergodic literature was a term coined by Espen Arseth.

Chapter 2: Methodology

For this research/creation thesis I employed a practice-based research methodology informed by three distinct yet complementary sources: *practice-based research into freestyle dance* and *game design, games* and *literature*. These sources were used to evaluate the following concepts:

1. Imitation interfaces as methods of learning.
2. Visual notation and aural cues of dance in games.
3. Authenticity in video games specifically relating to hip-hop performing arts.

In this interdisciplinary research, games were an invaluable source of knowledge; I logged over 300 play hours and organized informal game nights to play Kinect games in a social setting. My selection of games was motivated by a desire to become literate in video games and in order to better understand the field. I chose games that were regarded as pivotal to the history of video games, highly popular, had outstanding game design, particularly well-done interface designs, used dance as a thematic and incorporated social play.

I contextualize my practice-based research with two case studies: the *Grand/Funcom Internship* in game production and my time as owner of the dance studio, *Studio Sweatshop*, and show how these two sources of practical research contributed to my theory of *movement design* for games. This document should be considered as a partial claim of my contribution to knowledge in the field of dance gaming and only complete when experienced in tandem with the associated design projects.

Game Design Practical Research: The Grand/Funcom Initiative

In the summer of 2012 I participated in a 10-week student internship at the Montreal game studio, Funcom supported by Grand[5]. Our team of 10 students was tasked with the challenge of making a local-multi player game for PC. We were a small team so I ended up working in several different roles: game design, narrative design, 3D modelling and animation, as well as GUI design. This was my first experience taking a game from concept through to the level of a playable prototype. While the game we made was not a dance game I was able to try out my ideas on how movement could influence game design and subsequently, player experience. The game was a local multiplayer for up to four players using either keyboards or game controllers. I hoped to exploit the social aspect of local play by seeing how the players' bodies could be more directly implicated in the game, and how to get the players interacting with each other in real space. I was able to achieve this to some degree in the narrative design.

Narrative

Doing the job of narrative design gave me an opportunity to test *peer review* as a method of assessment in social play. Players were posed questions, triggered by examining objects in the game, that required them to evaluate their teammates gameplay or to make moral decisions to either save or sacrifice a teammate etc… My goal was to incite discussion between players, calling to attention their mutual presence in real space. This goal was somewhat successfully achieved and with more time and testing I believe pushing the narrative in this direction could have enriched the local multi-player experience. It also revealed the soundness of a peer judging system where players evaluate each other's performances as well as their own, as a qualitative judging rather than a quantitative one.

User Interface

Working on the interface design provided a valuable insight into how this component can make the overall game experience smoother or more frustrating. I

learned during the internship that game designers and programmers often have a love/hate relationship with the Graphic User Interface or GUI. When it is done well the player shouldn't even notice it is there because it is integrated seamlessly into the game while communicating essential feedback to the player. For example: if the attacks on enemies are inflicting damage, how much health the player has, the cool down on attacks, progress through the level maps, menu selection etc…. The goal of UI should be to bring the avatar and the organism together by designing interface solutions that help to immerse the player in the game. Feedback contributes to a sense of achievement, and simply put, it makes the game more fun if players know that what they are doing is working.

Following this logic I learned that a good game must have predictable results, as confirmed by Swink in his book *Game Feel*, "when the controls seem random, continuing to play seems pointless. There's no point in practicing if the game just gives a random result" (298). Unpredictability does not encourage a person to stay and explore the environment because there is no clear learning curve or incentive. Interestingly enough this doesn't mean predictability needs to be limiting, a "… predictable result should reveal as much about the possibilities you haven't tried as about the ones you have" (Swink 300).

For me this sparked the research question regarding how feedback is given in dance games. For example, Dance Central is very good at telling the player where they aren't but not as good at telling them where they actually are in space in relation to where the game requires them to be. Incentive to improve is hinted at by the interface, by indicating where the player's body is going wrong, but does not quite give the player enough usable information to improve. However when compared to all of the other dance games currently on the market, Dance Central gives players the most feedback and most complete tutorials and should be applauded for their efforts in this respect. This research shed a light on the significant role that the user interface plays in creating a bridge between player and game and the effect this has on how the player performs.

3D modeling and animation

During the internship at Funcom I taught myself to use 3Ds Max and built 80% of all the 3D assets in the game, i.e. the items that one picks up during the game events, or that players buy in the store. I also designed several of the enemies in the game and for this I had to learn about rigging and animation. Learning about the technical means by which avatars are constructed exposed me to the fascinating ideology of *humanizing* avatars and animations. For example in order for models/avatars to be perceived as human-like, they have to be dirtied up, otherwise their features and movements seem unnatural.

This information helped me to understand the path of movement in dance games as it flows from a motion-captured human body, inherently imperfect, mapped onto the body of the avatar, purposely imperfect, back onto the body of the player who is imitating the body of the avatar. I believe this is unstable embodiment and asks the player to strive for a model of unattainable perfection - in the perfect repetition of the dance score and by mimicking the 'humanized' avatar. I argue this is a less exciting and less useful method for training players to be dancers of social forms.

Freestyle Dancing and Studio Sweatshop

Studio Sweatshop[6] was open between the years, 2004 and 2011 and my goal for the dance studio was to create a hub for breaking in Montreal; it was the first studio of it's kind in the city. The studio acted as a cultural center, a meeting ground for local b-boys and b-girls to train at weekly jam sessions. I also provided classes and specialized workshops for adults who were interested in learning various forms of street dancing[7]. During open jam sessions members of the broader breakdance community, made up of both local and international dancers, met and trained together. These sessions generally consisted of dancers performing a mix of: personal breakdance training, cyphering and friendly battles. Typically I would have on average a total of 80 students per session, which breaks down to around 8 per class, and 20 at each of the three weekly jam sessions.

Having grown up in a formal system of dance education, Jazz, Tap, Ballet, and Contemporary dance, I was deeply familiar with the structure of studying dance in a studio setting. When I began teaching breaking I modeled my classes on these systems, even though this is not how I personally learned to break[8]. I quickly discovered this was not the right approach because Breaking, at heart, is a freestyle dance deeply connected to music and to the concepts of improvisation, competition, and battling. I had to discover a way to teach students that respected the roots of breaking as I had come to understand them.

In Contemporary dance, dancing to music is not essential and dancers often dance through the music and in silence. In breaking however the music is the spiritual guide for the dance, the two forms are entwined and still to this day b-boys and b-girls will dance to the original breaking anthems from the 70s (Schloss, Foundation 16). Improvisation, or freestyling, is driven by this connection and as a breaker I find inspiration within the music by dancing to the tune of individual instruments i.e. following the rhythm of the bass, then the riff, back to the bass etc…, as well as the lyrics and overall feel of a song. Essentially deconstructing the musical track into a plethora of different influences that I can pick and choose from. Inspiration can also be taken from one's surroundings including people in the immediate environment - this is particularly apparent in a dance cypher[9] where other dancers are in close proximity.

When freestyling I also draw from a concept of movement systems situated within the framework of the music. I define movement systems as pathways that can be linked together by finding familiar moments through which to transition and achieve flow in freestyle. For example the breaking foundation step – the 6-step[10] – can be seen as one singular move or it can be looked at as a movement system consisting of six moments in space. Within this system I consider each of the six moments contained within the pattern to have the potential either to be tangible or intangible, to be performed or not, transforming the 6-step into possibly a 5, 4, 3 or 2-step by skipping certain parts or become a 7, 8, 9 or 10-step by inserting and

adding. Space between moves is fluid, expandable or reducible. I consider a system to be either closed or open; closing a system means staying and improvising within that system, opening the system means it's open to the possibility of transitioning to another arrangement. While dancing the 6-step, if I choose to close the system, I'll work within the possibilities available to me such as subtracting or adding steps, playing with the rhythm of the steps oscillating between quick, slow and frozen, changing my orientation according to the space around me perhaps directing the movement towards someone or something as a challenge or for aesthetic emphasis (e.g. I know the move looks better from a certain viewpoint).

When I choose to open the system, there are at least six ways to exit. To exit smoothly I must open the closed system at a point where connection is possible with another system by anticipating moments that are alike. Breakdancing footwork steps have many similar positions that serve nicely as points of transition, such as the 5-step[11] variation of the 6-step has a moment where one leg is extended to the front in the same way as a cc[12] does. This moment provides a potential through line between the two systems, from the circular 6-step system to the cc system that travels side to side. While dancing I also take into consideration the overall shape of the system, the 6-step system is inherently circular and depending what I want to express I could choose to transition into another circular system capitalizing on the centrifugal momentum, or to one that juxtaposes the circle as an point of accent within the freestyle flow. I also use this concept of systems to create a path of vertical transitional melding for example a top-rock[13] and a footwork system[14]. This transition is called a get-down[15] and moving along this vertical channel is particularly capitalized on in breaking, as each round the breaker usually starts upright and then moves down to the floor. In this case creating a through line between familiar moments happens more through a transformation of states, by translating the same movement from a standing orientation to a low orientation.

I approach choreography in games from the mentality of movement systems as one way breaking is a positive model for gesture-based game design. This

approach lays the groundwork for games that have the possibility of repeatability and predictability via a structure, but that also provides the player enough freedom to make choices and respond creatively to these movement challenges. This style of choreography still permits the player to develop fluency with the gaming system. This is one way I see breaking as a positive model for game design. My theory on breaking freestyle with movement systems is heavily referenced in my design work, most prominently in the *Home is Where the Cipher is* game discussed in Chapter 4.

Cypher Games

I developed four play scenarios called *Cypher Games* as methods of training for freestyle dancing, concentrated in and on the cypher. These play scenarios have also influenced my theory on designing for *breaking-feel* in games. They work by placing the dancer in a situation that elicits an essential part of how it feels to break from the perspective of the internal practice of this dance, not on how it looks. This was always a focus in my breaking classes and was a major contributor to my decision to never install mirrors in my studio; Breaking is inherently circular so relying on a fixed reflection for aesthetic feedback is a major impediment.

What is a cypher?

A cypher happens when a group of dancers form a circle and take turns dancing in the middle. “A cipher [sic] can be built virtually anywhere at any time: all that is required is a group of dancers. It does not require a stage, an audience, a roof, a dance floor, or even a designated block of time. The cipher’s very informality and transience are part of its power; it appears when and where it is needed, then melts away.” (Schloss) Cyphering is extremely important to the culture of breaking and “B-boys and B-girls view the cipher with an almost mystical reverence, befitting its status as the most authentic, challenging, and raw environment for B-boying.” (Schloss) (Photo by Matt Power, dancer JoDee Allen, photo use permitted by the photographer for non-commercial use)

When spontaneous battles happen inside a cypher there are no official judges, just the other dancers and the competitors own conscience. When cypher battles are organized there is a judge, sometimes whose identity is unknown. Joe Danny Aurlien, of the Red Mask crew, pioneered this judging style in Montreal with his event *Who's Hungry*. In 2008 he employed the concept of "mystery judge" (three cyphers - three unknown judges) as a way to encourage dancers to be mindful of their own performance in relation to their cypher competitors, rather than performing to please a particular judge. In cypher battles a winner is usually chosen based on some or all of the following criteria:

- Entering the cypher most - a difficult task because there are no set 'turns' so a dancer must assert themselves to enter the circle lest someone else beats them to it. Battle cyphers can get quite aggressive and require a dancer to be fierce and dominate the center of the circle or else they will be ejected.
- Dancing the hardest – dancing 'hard' suggests dancing with full energy and intensity, requiring a lot of stamina.
- Creativity and not repeating moves – this demonstrates a capacity to freestyle and a depth of practice by having enough moves in a dancer's personal repertoire to not have to repeat.
- Battle strategies – the call and response between cypher opponents and how a dancer responds to challenges.

I consider these criteria to represent key elements in breaking: control, endurance, confidence, creativity and flow - I feel that playing a game about

breaking should reference or cite some or all of these elements. In his book *The Art of Battle*, B-boy Alien Ness, of the Mighty Zulu Kings, describes the essential battle elements as Fire, Earth, Air, Water and Ether.[16] (Ness) Fire equals intensity, Earth is movements on the floor, Air are movements performed standing or in the air, Water is flow and Ether is musicality with every part of the dance connecting to the beat (Ness). There are many similarities between this breaking philosophy and my own such as, intensity or b-boy/b-girl bravado, using all elements of the dance from floor to standing and flow and musicality. The cypher games teach these values plus cypher etiquette as well as the use of peer evaluation to encourage active watching and self-learning.

In Montreal during the 2010 edition of *Who's Hungry* a precedent was set in terms of peer review, when the competitors were asked to vote for the winner of their battles.

This system calls for the participants to justly decide the winner, based on their own assessment of how they performed. In choosing this judging method Joe Danny hoped that humble self-evaluation would encourage a heightened sense of active watching and self-awareness. This form of adjudication is driven by *self-perception* and asks breakers to be accountable for and acutely aware of their own performance. Some dancers at the event found it difficult to declare themselves the loser regardless of the merits of their performance; primarily due to a desire to uphold the appearance of unwavering confidence in their own abilities. Alien Ness counsels against this response to losing when he writes, "The worst thing in the world is when one can't admit to losing a battle." (Ness) He goes on to say that "…although in a battle there must be a winner, in reality there is no such thing as a loser. Its [sic] been mentioned time and time again by me…that whenever one enters a battle and loses, if he or she can leave the arena knowing exactly why they lost, then you are one step closer to the win" (Ness). In this quotation Ness is referring specifically to formally judged battles, encouraging breakers to accept and reflect upon their losses.

In breaking, and in dance games, I believe in emphasizing the intrinsic rewards of *doing* rather than the extrinsic reward of *doing for the sake of winning*. I think employing both peer and self-review in battles accomplishes something in both reward categories. By mutually deciding a winner it asks the dancers/players to be mindful about their experience; it reinforces being *present* during the act of dancing. In this way the decision of who wins or loses is a natural outcome generated by a shared felt experience between two dancers, rather than an external critique made by someone on the outside looking in. I believe that if applied correctly the internal evaluation of *players by players* provides a solution to the problem of how to qualitatively evaluate dance in gaming and opens up the possibility for more freedom in terms of movement.

The following games teach some of the values of cypher and battle etiquette and also incorporate a peer evaluation method to encourage active watching and self-learning.

Play #1 – Control and Cypher Size

Incrementally reducing the size of the cypher circle.

This game requires a group of dancers, preferably six or more who start by making a large circle with gaps in between the dancers. After each dancer enters once, they reduce the size of the cypher by stepping one step forward. The dancers continuously take turns dancing in the ever shrinking cypher until someone faults by either stopping dancing, or touching someone in the circle. At this point they are eliminated from the game but remain part of the circle. The cypher continues to reduces until the dancers are shoulder to shoulder. Once two dancers remain, they dance one final round and the group votes for winner of the battle. *What this teaches is the importance of self-control and quick thinking. It's important to know what moves you can do inside various sizes of cyphers.*

Play #2 – Call-Out Round Robin

The current dancer calls out (challenges) the next dancer in the cypher.

Dancers will initiate a battle by calling out one other dancer in the cypher. The dancers begin a timed battle of 2 minutes, the winner of which gets immunity for the next round. If the dancer who made the challenge loses they must choose another opponent and keep dancing, if they lose twice in a row they are out. This format challenges dancers stamina, encourages bravado and strategic use of their opponents' strengths and weaknesses.

Play #3 – Re-mix and Dominating the Cypher

Beginning a set with the move the dancer before ended with.

Dancers must respond to the final move of the previous dancer by doing something similar and/or ideally 'better'. *Better* is defined as a similar move of a higher difficulty, a more intricate way of entering the move, a visually pleasing combo incorporating the move in question, or performing the move very musically. If the group feels a dancer fails to successfully 'one up' their opponent then they must forfeit and another dancer begins. There is no set order for people to enter, and the first dancer to successfully enter the cypher seven times wins. *This format encourages developing creative strategies for responding to challenges.*

Play #4 – Restrictions and Gearing Up

Dancers enter the cypher in the order they are standing in. Each dancer takes a turn choosing the restriction for the following dancer, i.e. the right hand must never touch the floor, or the head may never leave the floor. If the person fails the challenge they are out and play moves onto the next person in line. Game play continues until there is only one person left. *This pushes creativity, re-mixing as well as challenging the dancers to face weaknesses in their repertoire.*

<u>Discussion</u>

This first phase of research brought me to two main conclusions:

1. Movement systems, as game choreography, could achieve a balance between predictability, repeatability and improvisation.

2. Peer review as a method of evaluation in dance games would place value on both intrinsic and extrinsic rewards.

In the next chapter on Dance Game and Literature review I anchor my research with a close look at two games: *B-boy* and *Dance Central*. Both are dance games however differences in console design helped me further dissect the pivotal role interface plays in the experience of dance in games. Each game uses hip-hop culture in their narrative but I question the authenticity of approach as it relates to the real foundations of breaking.

To address these two problematics it was necessary to examine how these games approach *narrative, characters, controls, graphic user interface, audience and language.* The results of this analysis also helped inform my practice-based research.

Chapter 3: Dance Game and Literature Review

Dance Dance Revolution

Any study of dance gaming must begin with *Dance Dance Revolution*. This was the first game to popularize dance gaming and features a gesture controller that players manipulate with their feet. The DDR game pad controller is comprised of four buttons arranged in a cross, the player stands in the center and must step, with either foot, onto a button either forward, left, right, or back of their current frontal facing position.

Even though the mechanical interface of DDR is simplistic, the game became extraordinarily popular and inspired multiple releases. In his essay *Consuming Music Together*, Jacob Smith draws a link between the introduction of hip-hop to Japan, primarily through films, and the immense popularity of DDR among Japanese youth (Smith 194). He attests to the fact that the adoption of hip-hop primed the youth of Japan to embrace new social dancing practices such as DDR.

Anthropologist Ian Condry, who has done extensive study on hip-hop in Japan, cites the low budget film *Wild Style* directed by Charlie Ahearn as a pivotal influence in Asia because it provided a rare glimpse into hip-hop culture and the New York breaking scene in the early 1980s (Condry 62). It also helped that many of the *Wild Style's* dancers/ performers visited Japan to promote the film (62). In the USA the biggest commodity of hip-hop is rap music, however in Japan breaking initially took top billing because of the universality of a physical language; "Dance, movement of the body… can move easily across linguistic and cultural boundaries. Movies and videos were clearly an important channel for this exchange. It's also clear, however, that a flow begins not from a complete understanding, but rather from some interaction that can incite curiosity and a desire to participate" (63). The adoption of hip-hop by Japanese youth, which grew out of an incomplete understanding of the culture, produced some representationally problematic ripple effects such as, some hip-hop youth in Japan would refer to themselves as *blackfacers* and 'darken their skin and kink their hair' in what they considered to be a performance of *cool* more than of race (38 - 40).

Putting aside this misinterpretation of hip-hop culture, it was their undeniable desire to participate that helped trigger a new era in social dancing through video games. *Breaking might not immediately come to mind when thinking of social dances but it is just that, and often occurs in public places.*

> From the beginning Breakdancing [sic] was clearly more than just a new kind of dance. Following in the footsteps of graffiti, breaking was the first dance form that involved the appropriation of public space. Sidewalks, public parks, and underground shopping mall hallways are transformed into a public stage sometimes marked by cardboard or linoleum being rolled out, but often simply created by the dancers themselves (65).

B-boy Kwik Step of Full Circle crew, states in an online interview with Strife.tv, that this culture is embedded in the socialization of a people, not just in the moments of

dancing but how the culture permeates into everyday life. He believes crews are like families and breaking events encourage the sense of connecting to a larger community not only through testing one's skills against another dancer but also through socializing and sharing (Step).

The release of DDR as an arcade game firmly anchored dance gaming as a social practice. In combining Japanese youth's love of dance and karaoke, DDR has sometimes been called karaoke for the feet (Smith 194)- both a social practice where the player chooses a song and then a script, of either lyrics or dance steps, unfolds temporally on a screen. DDR's movement score is visually displayed using arrows as ideograms that both describe vectors as well as connote place i.e. an upward facing arrow denotes 'ahead' but also 'step on the button ahead of you marked with a similar looking arrow' (Figure 1). DDR's graphic interface displays side-by-side movement scores for up to two players, the picture below shows a sample script of two players each playing on a different difficulty setting: standard and heavy. The frequency of arrows increases with the level of difficulty, requiring the player to react faster and perform more steps in the same amount of time.

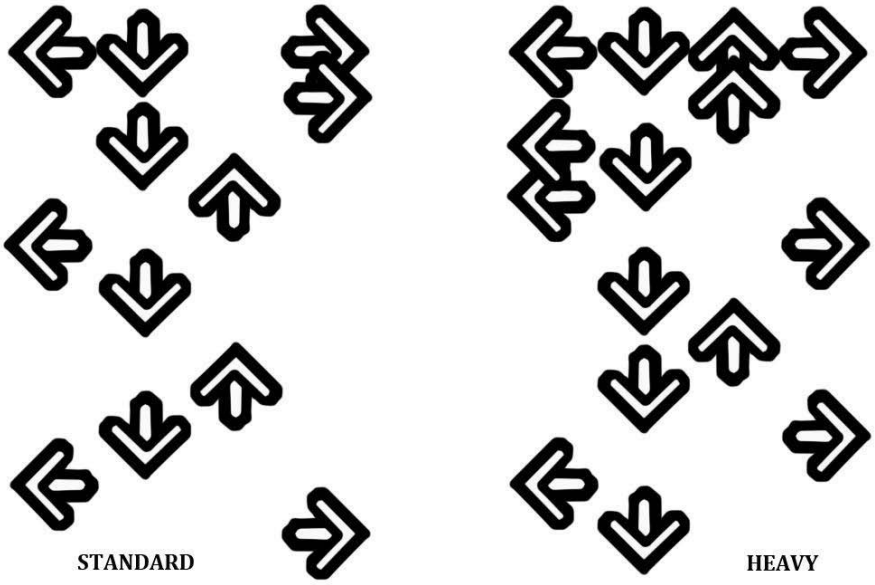

Figure 1

Because gameplay is isolated to choreographed movements of the player's lower body[17] the movement script only indicates where the player's feet must go. This means the player's upper body is free to establish a personal play style while still succeeding at the game. Players would sometimes take this a step further and "choreograph their own freestyle performances…some fans even hack into the game and make their own 'edits', programming their own steps patterns for DDR songs (Smith 207)."

This type of visual dance script calls to mind another codified visual method for teaching social dance, the Arthur Murray technique (Figure 2). In the diagram below we see the sequential footsteps of two dancers, male and female, visually distinguished by shape of the feet. While both DDR and Arthur Murray use arrows, as indicators, in DDR all player movements originate from and return to the center of the game pad whereas in the Arthur Murray diagram arrows are meant to move the dancers through space.

DDR and Arthur Murray both concentrate on the path of the feet but the increased choreographed complexity of newer dance games demanded more complex methods of communicating dance. The tracking technology of the Xbox Kinect significantly broadened choreographic possibilities and resulted in Dance Central for the Kinect taking a three-pronged approach to movement notation that I will discuss in greater detail in the section on DC. While the tracking system places different spatial demands on the player they still aren't required to move through space; with the exception of *Just Dance*, which incorporates spacing changes that are initiated by the game asking players to displace themselves.

Unlike DDR Choreographies in DC and JD both solicit movements from the whole body leaving little room to establish a personal play style. A player's interpretation of a DC choreography will naturally vary from one instance to another, exaggerated by more complex routines, however deviances are valued negatively and can affect their game score. Although as one reviewer writes, "Dance Central strikes a nice balance by tracking you closely enough to make it rewarding

to nail a move, but not so closely that one errant hip sway is going to ruin your routine" (Watters). This game allows a margin of error so as not to discourage the player, however loose tracking does not change the goal of the gameplay, which is still to imitate as perfectly as possible. I will come back to this in greater detail in the section on Dance Central.

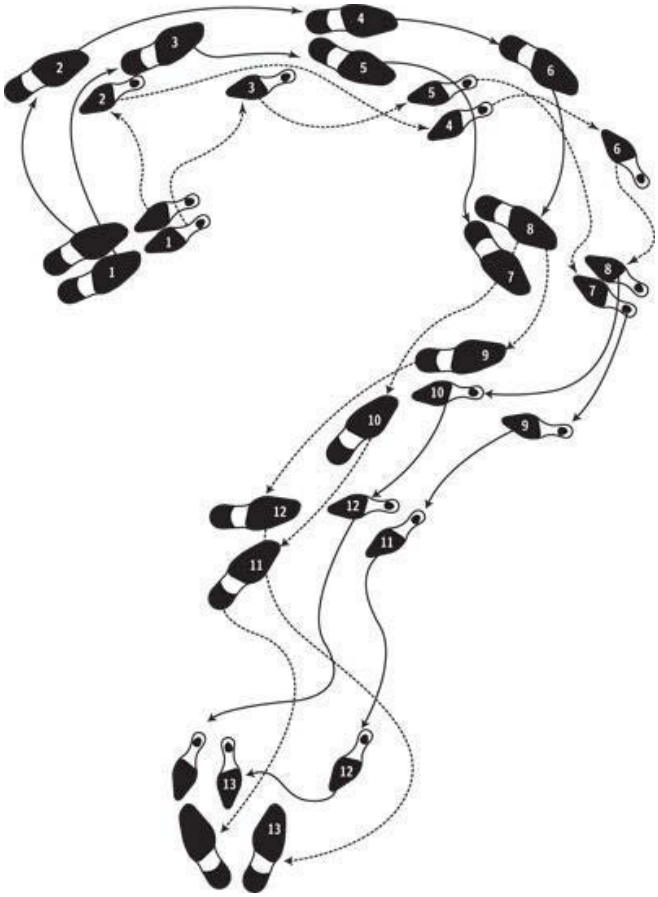

Figure 2

B-boy

B-boy, as the title suggests, is a simulation game about breaking developed for PlayStation Portable and the PlayStation2 console. Game reviews of B-boy criticise the control scheme for being clunky, overly complicated, with loading times that are too long, and hosting non-player characters that are poorly animated and repetitive (Haynes). Based on these evaluations one would be led to believe that B-boy isn't a

very good game, however these perceived faults actually represent a level of truth about breaking that is reinforced by both the narrative and the game's mechanics. I argue it is a successful model of *breaking culture* because it emulates not just the moves but depicts how the philosophy of breaking permeates every part of breaker's life.

Narrative and Characters (B-boy)

In B-boy there are two modes of play: Arcade mode – called *B-boy Jam*, and career mode – called *Livin' Da Life*. In Livin' Da Life, the central hub is set in a live-in loft space and provides the player access to four different game options:

- Read the message board
- Wardrobe and character customization
- Practice and level up moves
- The move-book

The message board, accessed through a laptop computer in the loft, contains emails from respected b-boy Kool Roc and 'the admin' either informing the player of battle challenges they can choose to accept or point out recently unlocked content. Messages from RSC_Zulu (Rock Steady Crew and Zulu Nation) explain the value of winning medals - how performance is evaluated - and indicate why each medal is important to *breaking* in the game. RSC_Zulu also serves as a spiritual guide, encouraging the player to be an all-round *breaker* and not to place more value on any one element – *learn everything!* This suggestion from a highly respected crew hails from the same philosophy as the responses of Storm and Crazy Legs discussed in an earlier chapter: ...*learn the fundamentals not just crowd pleasing power moves.* The choice to 'learn everything' is available to all players, they can learn foundation moves as well as power moves and the game ranks them nearly evenly in terms of points, however learning all the moves is actually unnecessary in order to win battles in B-boy.

In *Livin' da Life* you may choose the sex of your character and customize their look; each characters starts with a basic set of moves including: several top-rock

moves, footwork steps, freeze and the windmill. Practicing the dance steps and winning battles levels up the character and unlocks new moves that can be added to the move book. Battling also unlocks new moves, new sponsors and new wardrobe options that help the player gain respect and move up in the ratings.

In *B-Boy Jam* all characters represent a real b-boy or b-girl who is well-known within the break community. The company legitimately licensed and motion captured 12 b-boys and one b-girl, who are legends in their own right. Pocket Gamer reviewer, Simon Parkin, believed this added to the thrill of the game, "The huge move list ensures that no two dances are the same and, once you get the hang of the initially difficult input method, you really feel as though you can express yourself in any way you wish. This thrill is heightened by the excellent animation of the characters, all immaculately motion captured." (Parkin)

B-boy walks a fine line between commercialization and the underground scene, while it is clearly a product designed to be sold the game developers respected the breaking community by featuring actual b-boys and b-girls.

Even though maintaining a vibrant underground community is essential Kwik Step believes having the choice to embrace commercial opportunities is a positive step forward in that it provides dancers with an opportunity to make a living from their art.

> Sponsorships…that's what's going to happen with b-boying now, and b-girling, people are going to be able to make a career out of it and if people don't forget about the movement then it's gonna [sic] have a chance. If people just focus on the moves then it has a chance of becoming too commercial, and you know, losing its roots…There will always be the super uber [sic] commercialized version like So You Think You Can Dance, and America's Best Dance Crew…I think that plays it's part for people who can identify with that and then you're going to have the ultra underground and people are going to be able to choose that (Step).

To reiterate, B-boy Kwik Step believes commercialization is inevitable but if the lines of communication between the underground movement and the commercial market remain open then there is a chance the roots of the dance will not become totally absorbed.

Controls and User Interface (B-boy)

Musicality and timing are highly valued in B-boy and are communicated through several different feedback and reward systems such as: yellow markers indicate when to make transitions to s, often at the beginning of musical phrases. In order to score more points the game displays a yellow bar at times when it's a beneficial to perform a freeze such as at the end of musical phrasing. This is in good keeping with where the emphasis in funk and hip-hop music often lies and points are rewarded for well-timed transitions and successful sequencing of actions. In some cases proper timing and sequencing permit more powerful moves to be performed emulating the build-up of momentum and *hype*.

The dance vocabulary the character can perform during battles comes from the moves assigned by the player to the movebook. Though the game hosts a huge variety of moves, the capacity of the book is limited to twenty-four moves at one time; however moves can be swapped out at will. Top-rock moves are already unlocked while the rest of the moves have to be earned. These earned movements belong to three fundamental categories: freezes, footwork and power.[18] While the control scheme has been criticized for being 'clunky' and overly complicated, it also allows the player to choreograph their own experience of dancing. They can assign, with some limitations, what controller action performs each move. For example:

- Both the order of difficulty and the category of move are unchangeable
- The footwork category is accessed by pressing the X button
- To perform a specific move such as a 'cc', considered by the game to be a basic easy move, one needs to press the D-pad 'down' arrow once followed by the X button

- Pressing the arrow once indicates that the move is easy, twice means the move is more difficult and thrice calls the hardest moves

Players can also personalize their dance style through what moves they assign to their movebook. These two mechanics give the player a level of editorial control to reassign and thereby rewrite their game experience; not an uncommon mechanic in video games generally but quite uncommon in games about dancing. Even though the hands alone are facilitating the experience of dancing, the player can freestyle in a similar manner to freestyling within movement systems. The systems in this case align with the categories of steps. Players can freestyle within footwork, transition through variations of footwork moves, or they can decide to move to another system such as top-rocking or power. Kirkpatrick goes so far as to say that even in the abstracted movement of the hands manipulating a controller, there are still traces of the form of the original action, "something of the experience... its tensions in the body, its discipline, its conscious manipulation of weight and energies – gets condensed into the hand (Kirkpatrick, Controller, Hand, Screen: Aesthetic Form in the Computer Game 134). He attests to the fact that the player's hands, while manipulating a controller, are doing something like a complex choreographed dance. Even though the rest of the body is not directly, or at least not intentionally implicated during these moments[19] (Kirkpatrick, Controller, Hand, Screen: Aesthetic Form in the Computer Game 136).

Kirkpatrick also states that achieving mastery over the player's own gameplay is desirable and requires an intimate understanding of the controller syntax, suggesting a capacity to speak for oneself (Kirkpatrick, Controller, Hand, Screen: Aesthetic Form in the Computer Game 135). In *B-boy* this effect is doubled allowing the player to choreograph their own play style as well as achieve mastery and improvisation. Similarly, Swink argues that an integral part of the *thrill of success* is embedded in the player's sense of ownership over the game. He maintains that this only happens when mastery is at a level where improvisation is possible.

(Swink 299) While B-boy achieves and supports this level of expression, as stated earlier, it is a quality of play that is often missing in most dance games.

One Game Spot reviewer encouraged players to build set routines to have a sure-fire way of winning medals, he advised, "You need a routine that will get you a high score in only three (medals). This makes it easy to put together a single routine that you can ride to victory after repetitive victory" (Dodson). Dodson perceives the ease of success after constructing a winning routine to be a failure of the game design. He invested time to construct the easiest and most efficient way to beat the game whereas he took pleasure in stringing together moves in pleasing ways and performing moves I am unable to do in real life. This game can either be approached from a choreographic or freestyle ideology, either to derive a winning formula that can be readily repeated or to master the controls for personal expression. The intrinsic value of winning in dance is different for each person.

In breaking this is a commonly discussed moral issue, especially when it comes to winning high stakes battles where sponsors and money are involved. Dancers will frequently perform a highly practiced, choreographed set during the battle to supercharge their chances of winning, as opposed to freestyling their rounds. However for those with a trained eye it's easy to spot choreography over freestyle because important elements are missing. It limits how dancers respond to what their opponents do in their rounds, and because dancer do not have advanced knowledge of what music will be played during the battle, a choreography will not as deeply visualize the music as freestyle would. There are nuanced approaches to choreography that leave some space for improvisation within a structure, but the higher the stakes, the tighter the structure with less room for ad-libbing. Contrastingly in more underground situations such as a club cypher, or smaller scale battles, breakers will tend to freestyle more. This indicates large-scale, more commercial battles are trending towards a divide in breaking: choreographed precision over freestyle. B-boy, the game, rightly gives the player the option to play

in either of these ways as well as providing a cross-section of battles from street level right up to sponsorship level.

Audience (B-boy)

In the game during battles the player must wait for their system-controlled opponent to complete a round of dancing. While these moments might seem like *dead time* in my opinion they are essential as they represent an important truth in breaking.

Break battles are akin to a conversation, or perhaps a debate; one dancer performs, while the other dancer watches[20] when the performance is over the observer must choose how they want to respond. This call and response is fuelled by strategy and is essential to the performance of both dancers. In a battle a breaker receives points from the judges if they respond and somehow improve upon the moves of their opponent. This can happen in many different ways, but generally a blend of creativity and proper execution is a winning combination.

In the game, players try to win medals back from their opponents and while this strategy is not quite the same as in reality it comes close. For example winning a battle is based on the number of medals won in the following categories: Rhythm, Creativity, Flow, Blow-up and Foundation. As a collection, these medal categories are an authentic expression of what is valued in *Breaking*.

(This system is similar to another judging methods codified by Canadian b-boy Dyzee, Karl Alba[21])

B-boy also reinforces the permeability of performer and audience and how in battles a *breaker* flips back and forth between doing and watching. This exchange is part of the socialization of *breaking* and is derived from the cypher's inherent *turn-based* pacing, which provides moments for reflection, learning, rest and recuperation.

Breaking is a social dance form that is generally about asserting one's claim over space and the mastery of oneself. This is felt more strongly when there is pushback from other dancers asserting a challenge to these claims of ownership and

mastery. Therefore the presence of an active audience made up of experienced dancers willing and ready to participate in a cypher are essential, while a passive audience waiting to be entertained is not. The presence of a *passive audience* neither validates nor invalidates the performance of the breakers.

Naming and authenticity (B-boy)

Authenticity in this game begins with the title, B-boy. This is a significant choice because *breakdancing* was a name coined by the media whereas *b-boying* heralds from within the culture. Calling the dance b-boying is one way hip-hop culture hopes to reclaim ownership of the form and save it from the mass media misrepresentation that has ensued as a result of its commercialization. James Barton in his complete B-boy game guide written for GameFAQs writes, "A lot of people (potential game buyers) will be familiar with the word 'breakdancer' but not with 'bboy' so they might be missing out on a few sales" (Barton). However he commended Sony for releasing the game with the title ***B-boy*** because he felt it did justice to the underground culture.

One area where the game fails, in terms of authenticity, is that a player is not allowed to choose a name for their customizable character. Barton also identifies this as a problem, "A b-boy's name is very important to him – some think carefully before choosing one, many have their name given to them and a few even battle to earn the right to use it. So, you'll be wanting [sic] to give your character a cool name, right…? Well you can't. Sorry!" (Barton). He correctly points out that a b-boy or b-girl's name holds great significance as it may not only represent the dancer herself but also may represent the elder dancer who gave it to them; the naming process is steeped in ritual and rites of passage.

When a move is unlocked in the game, only it's name is given i.e. 'you have unlocked the Chair'. Unless the player knows from experience that the chair move is a freeze they will have no information on where it sits in terms of a category, i.e. freeze, power or footwork. In this instance it seems as though the game designers

have decided that the name of the move is all the information the player needs. In breaking however the naming of moves often reveals its historical lineage, for example it is clear to me the game was made in the UK because names attached to dance moves were clearly British and not North American.

The font in the *move book* appears handwritten, which communicates a feeling that it is in the player's own hand, something akin to a diary or journal. This highlights the personal importance that breakers place on moves and how they are treated as intimately guarded secrets, signifying the practice of notating moves as sacred.

Finally, another aspect of this game that stands out is how failure is communicated not only through points and medals but also through a character's body language. For example looking 'stoked' or not, at the end of a battle indicates winning or losing respectively, or if the player fails at a control combination their character will fall out of the move and take time to recover. Dance games for the Kinect don't acknowledge failure outright, no matter how poorly a player may dance, the song will always play through to the end. Dance Central is an exception in that during tutorials a player cannot move forward until they successfully perform the move as shown in the game. This is the opposite of the game B-boy where practice is encouraged and generally treated as a safe space to master the controls and level up; and battles, the main performance, are either won or lost outright.

Dance Central's well-executed tutorial mode uses repetition to help the player learn choreography, which is a common and effective teaching technique in dance classes. However there are different trains of thought concerning motor training for performers. Looking to motor training for musicians, there are two main ideologies: Bernstein versus Pavlov. Ito, in his essay "Repetition without Repetition", champions the Bernsteinian perspective as a learning methodology because it makes for better-prepared musicians in terms of being technically

equipped to respond to unpredictable, or at least, various types of circumstances. (Ito)

The Bernstein reality of repetition is: no two movements are exactly alike and this discrepancy arises from many factors (Ito). Whereas Pavlov's theory leans more towards the efficiency of doing a movement perfectly, slower if necessary, then building up speed and number of repetition to ingrain the precise movement into the body's muscle memory. For a movement to be identical the muscles must fire precisely the same, therefore the starting position and end position must be the same respectively. Due to environmental, neurological and physical reasons this Pavlovian ideal is bound for failure. Animators 'dirty up' the look of animations to make them less perfect to make them seem more real, (Swink 304) and so demanding perfect repetition in dance video games also threatens to deaden the inherent liveness of performance.

Art forms, such as Classical music and Ballet, still hold to machine-like ideals of perfection and artists submit themselves to rigorous modes of repetitive training. On the other hand musicians, jazz and rap, and dancers, hip-hop and breakers, aim for a high level of *responsive* performance. In theory artists trained in responding rather than repeating are able to instinctively and creatively react to unforeseen circumstances such as muscle fatigue, injuries, or environmental obstacles. This is accomplished by designing training methods that incorporate improvisation alongside technique; a feat achieved by B-boy but not by Dance Central. For example in *practice mode,* the game B-boy adopts a Bernsteinian perspective in that it does not prescribe a training method that dictates how many times a movement should be repeated or in what order a combination of moves should be performed, this leaves room for variation and personal style.

Dance Central

Narrative and Characters

Dance Central and Just Dance are two of the most popular dance games on the market. The game Just Dance was initially developed for the Wii and then after the release of the Kinect expanded to include Xbox in its distribution roster. The way the avatars are rendered quite possibly reflect the game's Nintendo heritage and are in contrast to the Dance Central franchise that was developed solely for the Xbox Kinect. The designers of JD created unique characters for each song, conceived in collaboration with a fashion designer who fabricated costumes for each character in the game. The choreographer(s) then used the costumes as well as the song's lyrics and feel as inspiration to make the dance scores, which when completed were filmed against green screen (Just Dance). This type of video treatment requires significantly less processing power than the 3D modeled and motion-captured avatars of Dance Central. One of JD's design peculiarities is how all of the characters/dancers' skin is painted white, quite literally whitewashing race.

Just Dance offers song choices but players cannot customize or change a character. DC does a much better job at including diversity and providing the player with choices. In DC the player can choose their character (from a set list of non-customizable characters), the difficulty of the choreography, the venue or scene where the dance will be performed and fitness options such as tracking calories. Breaking aesthetic is clearly referenced in the Gridlock scene because it is set on the street corner of TopRock Avenue, the manner of dress, body language of the crowd, and because it is the default scene for Don't Sweat the Technique. Although Gridlock/TopRock Ave. is a venue option for all songs so the significance gets lost.

Scenes are part of how music is visually experienced in media "...heavy metal videos, for example often use dramatic live concert footage with the concert stage as the core location. Rap music videos (have)...ample shots of favourite street corners, intersections, playgrounds, parking lots, school yards, roofs, and childhood friends (Rose, Black Noise 10)." This trend of the 'visualization of music' in videos is echoed

in two of the major games from Harmonics: Rock Band and Dance Central. Rock Band, a rhythm gesture game, uses musical instrument simulators as controllers and features mostly rock and roll, folk and heavy metal tunes. The main scene in this game is a stage with a band performing live, which for this genre of music is in keeping with Tricia Rose's assessment of music videos. Dance Central echoes the trend of hip-hop music videos and features public spaces such as:

- A school
- The rooftop of a building
- Street intersection
- A club

These sites are less about the designer's attempt to accurately represent hip-hop culture and more about how media producers signify a 'street dance aesthetic'. Films such as Step Up reinforce this media born, street dance aesthetic, by using a mish-mash of hip-hop references and dance styles. The choreographies in the Step Up movies take bits and pieces of various dance styles and mix them together into a generic form falsely branded as hip-hop dance. This new media street aesthetic has little to do with the underground culture of breaking or other hip-hop dances and regrettably the choreographies in Dance Central follow a similar pattern of fusing styles.

In Dance Central 3 the player has the option to play through songs of a decade to discover a particular era's 'dance craze'. Each song either promotes an already existing dance or is responsible for inspiring a dance style, for example: the Macarena was used as the 1990s dance craze. In this narrative, the main characters travel back in time to discover the dance craze and stop Dr. Tran's evil plan! When the game gets up to the 2000s the main characters are overtaken by a mind-control device; by dancing well, players help free the characters from being Dr. Tran's puppets. The narrative suggests that the choreography and how it is performed by the player is more original and creative than Dr. Tran's mechanical dances, which is

why the characters need to be freed. Once they are freed, the characters exclaim, "Dr. Tran can't innovate, he can only imitate!"

This type of call for creative expression is a clear reference to the hip-hop mentality of promoting individual style and innovation over biting. However I find it ironic that this call for innovation and self-expression is embedded in a game that places more value on imitation than on aesthetic choice and does not provide paradigms for assessing variations within the games prescribed logic.

Imitation interface

Mimicry is a common occurrence in the development of new mediums, and digital games are not immune to this trend; digital games tend to be modeled after non-digital games or real-world play (Kirkpatrick, Controller, Hand, Screen: Aesthetic Form in the Computer Game 138). Popular themes for gesture games include sports and dance and because these games aim to replicate the experience of the real activity an observer can understand something about the game just by watching for signifiers in the player's body movements i.e. *Wii Bowling* players do *bowling-like* actions. However these games tend to fall short of the real thing for example: "Wii Sports tennis will infuriate a top tennis player with the simplicity of its controls, but I gives a non-player of tennis the experience of being skilled (Juul, A Casual Revolution 114)." Juul writes that smaller movements are all that are necessary and can replace larger, more 'tennis-like' movements to save energy. (114) Nevertheless players will often perform the full gestural movement even though it's unnecessary resulting in *gestural excess* (Simon). So why do it? "The enjoyment in such circumstances tends to derive from the performance of gestural excess in and of itself or else in the attempt to extend the simulation of the game in producing idealized versions… (Simon 22)". Imagination fills in the gap between what is necessary and what makes the experience *feel* more like what the player believes the idealized activity would feel like. When a game uses mixed and/or misrepresents cultural signifiers this could become problematic if the player's

understanding of the trueness of these cultural references is misinformed. Filling in the haptic gap with their belief could potentially produce a stereotyped performance that inadvertently mocks the culture instead of celebrating it. This could lead to a situation of social tourism where the imitation interface allows for a 'trying on' of culture similar to the way that dressing up in a costume can represent a marginalized culture. This is inflated by the nature of imitation interfaces and used as a powerful tool for embodied learning. Jenson and de Castell argue players practice skills that may be transferrable to real life and learn actual competency in the activity being played, rather than a simulated competency (Jenson and de Castell 5). While simulation games do not necessarily teach fully transferrable skills there is still the payoff of being able to experience the activities *form*. For example, *Tony Hawk* players can enjoy an experience without the risk of physical injury or possibility of arrest associated with street skating. It can be played with either a regular controller or a specialized gesture controller that is modeled after a skateboard deck. Playing with the gesture controller increases the potential for embodied learning but also increases the risk of injury. For example in order to avoid injury the Dance Central GUI reminds the player, "*Remember to mirror the dancer": If the dancer moves left, you should move left, if the dancer moves right you should move right.* ***If the dancer does a backflip don't do a backflip you could hurt yourself.***"

Menus and Authorship

Dance Central uses several levels of menus as hubs to access the game's musical and choreographic content. Playing songs unlocks new content and new difficulty levels and so player choice leaves a visible trace through this system of hyperlinks. Similar to a reader of a hypertext, a player shapes their game experience by choosing certain links over others in the process of creating a personalized map of their play. Readers of interactive media often have the opportunity to become co-authors however "[a] user of a hypertext novel...who

annotates and relinks his or her copy of the hypertext structure, is not on the same level of discourse as the novel's creator. Even an actor interpreting a dramatic role on the stage or on film is closer than the hypertext reader to the creator's position, sometimes to the extent that we speak of, say, Olivier's Hamlet (Arseth 167)." Kirkpatrick uses a similar example in music to make a connection between a performer's virtuosity in playing a musical instrument and playing with a game controller, "Great performers relate to the form they are given and bring it to life, rather than just playing through it. This is why they can be as important as the composer to realizing the potential in the piece." (Kirkpatrick, Controller, Hand, Screen: Aesthetic Form in the Computer Game 132)

In dance the roles of dancer and choreography exist on a similar continuum. Unison choreography in a chorus line or a corps du ballet strictly limits the dancers personal expression for the purposes of synchronized homogeny. Dancers are often cast for these roles according to a specific look or for the way they move so that differences do not distract the eye of the audience. In direct contrast to this practice modern and contemporary dance sometimes call the dancers 'interpreters' because of the added degree of freedom given to them in terms of inserting their personal expression into their role. Another example can be seen in the work of contemporary choreographers who use structured improvisation as part of their creative process and credit dancers with the co-creation of movement material. The roles of choreographer and dancer are not the same, although often in street dancing these two roles are combined and become what is called *freestyle*, where the dancer, through improvisation, spontaneously writes and performs their own dance. In much the same way that this genre of choreography dictates the amount of freedom a dancer has to interpret the 'script', technological systems, can and do, dictate how much freedom a 'reader' of a hypertext has in terms of becoming co-author. "The reader's freedom from the linear sequence of traditional literature, which is often held up as the political and cognitive strength of hypertext, is a promise easily retracted and wholly dependent on the hypertext system in

question." (Arseth 77) For example in Dance Central the roles of dancer and choreographer are fixed and the scripts are a time-released linear sequence without variation or gestural nuance.

The newest Dance Central release, *Dance Central Spotlight*, marks an interesting shift in how the Harmonix developers are crediting choreography in the game: choreographers are now called authors. Harmonix released a statement explaining that the **authors'** work with a databank of movements, compiled from previous iterations of the game, and assemble the dance sequences for each song from this resource (Brezinski). This new way of authoring or building choreography suggests that dance can be written. Recording and preserving dance through language has been something dance scholars have wrestled with for some time. One codified dance notation system, Laban Notation, is used to record choreographies but extensive study is necessary to effectively translate movement into written notation. It's equally tricky to get the dance to re-emerge from the text.

If reading dance could be considered a type of literacy then perhaps the reading of choreography in a game could be considered a form of ergodic interaction. Nansen argues for Kinect games to be considered a form of 'exergaming' where play is being validated by linking it to exercise. He focuses on the exertion necessary to be able to play these types of games. He writes, "many...authors identify with the focus on representational, visual and narrative elements is that they ignore forms of 'ergodic' interaction: a term coined by Aarseth to describe the work or effort required to 'read' a 'text'" (Nansen 75). Nansen situates gesture games on a continuum towards leisure and exercise, but I argue that due to the authorship of choreographies in DC, playing this game is more akin to embodied reading. As Arseth argues, "To write is not the same as to speak; listening and reading are different activities, with different positions in the communicative topology. Within these categories there are more differences: listening to a tape recording that you can control […] is more akin to reading than listening to a live lecturer as part of a large audience." (Arseth 162) A choreography

in DC can be repeated at will and broken down into parts in a different way than in a real classroom; here the visual representation of the dance is codified and does not change whereas a dance teacher demonstrating the same choreography multiple times will never be the same twice. Imitating live dance versus game dance are different activities. Dance games seem to necessitate a distinct kind of literacy - to decipher gamified movement as it translates from human body to written code back to the human player.

Gamers usually have a relationship with games that involves what Atkins calls the 'game gaze', a "focus, always [...] not on what is before us or the 'what happens next' of traditionally unfolding narrative but on the 'what happens next if I', which places a player at the center of experience as its principal creator, necessarily engaged in an imaginative act, and always oriented towards the future (Behrenshausen 336)." The state of DC choreographies as a text that are designed to be read removes the possibility of '*what if*' beyond the question of what happens if I don't follow the choreography or I stop dancing. Once a song is chosen the choreography plays out uninterrupted and the player chooses to participate in the timed reading or not. However certain outputs of the game are affected by the state of a player's performance for example, what the announcer says, the point tally, and star ranking. Based on this feedback the player has a choice to try and improve their performance but due to the nature of the UI feedback, that choice is less of a choice than one might think. Visual feedback for player error is indicated by a red outline around the part of the body that is out of place. However the game does not give useful indications as to where the player's leg actually is in relation to where the game parameters require it to be. The only visual indication of the player's self is a poorly defined silhouette in the top right corner of the screen. The image is much smaller than the character in the center of the screen, the quality is disparate and consequently it's difficult to make a quick effective comparison between the two images. The size of the representation of the player is similar to the static images of the pictograms that unroll vertically on the right hand side of the screen. These

pictograms (Figure 4) depict the upcoming moves in the sequence and sometimes are coloured gold for extra emphasis, indicating the move is important and the player should concentrate on executing it well; as in the case of a 'dance craze' move in story mode.

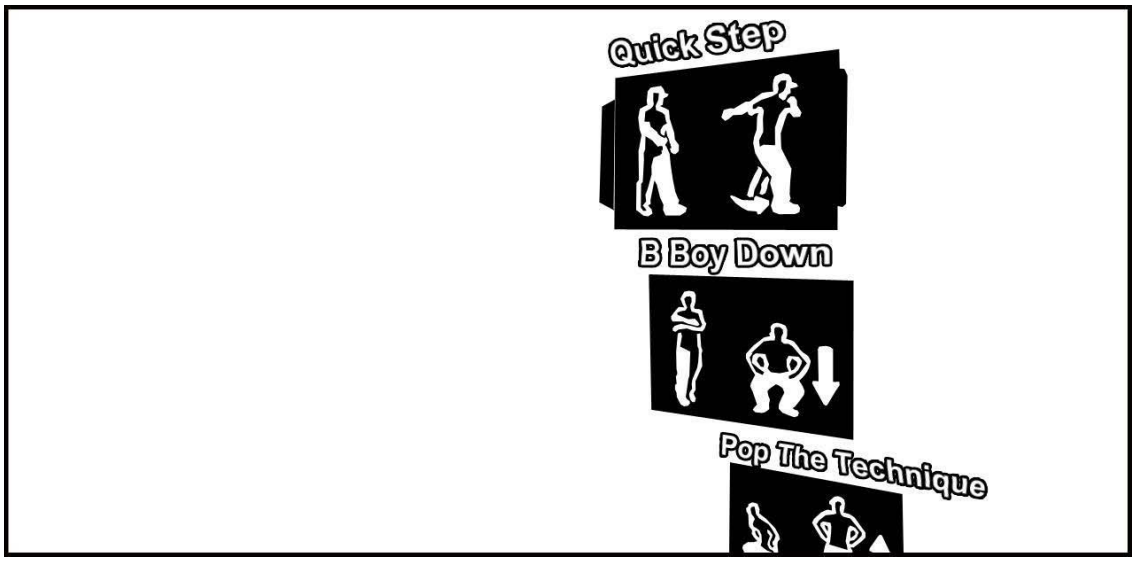

Figure 4

Marketing for gesture games focuses heavily on the player and the "mimetic interface shifts attention from the game world or what's on the screen to the player's body in physical space, out in the living room (Jones and Thiruvathukal 3)." However, the player's focus is still towards the screen, not only with their gaze but also with a front-focused body orientation. This reliance on the screen coupled with no reliable visual feedback, make it difficult for a player to form a sustainable mental and physical connection between what they imagine they are doing, what they are actually doing and what the game is inviting them to do. If the player knows for sure where they are in relation to where the game wants them to be, in order to score higher points, then they can make an informed choice as to *whether they want to be there or not.*

At set times during each song Dance Central pauses the choreography to film players in a 'freestyle' moment, these moving images are played back to the player in fast-forward with a scrubbing effect. Players are abruptly confronted by their

own image and the disparity of the vision of the player's living room performance juxtaposed against their non-reflective mirroring of the cool characters in the game is shocking. It's clear in these filmed moments their interpretation of the character's script was not enough to affect a transformation.

Naming and authenticity

The study, *The effects of enactive encoding, type of movement, and imagined perspective on memory of dance* by Mary Ann Foley, Veronica Bouffard, Tarja Raag, and Mary DiSanto-Rose, asked participants to either imagine doing an action, imagine someone else doing the action, physicalize the action (enactive encoding) or just listen. Non-dancers were tested against dancers to see whether dance training would provide a literacy support to performing and retaining the action commands through movement. This research found the effects of visualizing someone else performing the movements were not as effective as self-visualizing or enactively encoding the action and that dance training did aid in retention especially when verbal descriptions of the dance steps were given. It also showed "both adults and children alike sometimes confuse what they did and what they imagined themselves doing (Foley, Bouffard and Raag 252)."

For ease of memory, dance moves are commonly named like action commands, describing the type of action to be performed. For example in Ballet: *ronde de jambe, battement.* In breakdance however, names often reveal the lineage of that particular move. For example, the b-boy who created *Zulu Spins* is a member of Zulu Nation. To someone literate in breaking, these names also become somewhat like action commands and a sequence such as: *Salsa Step, Gremlin, Drop The Needle, 6-step, Baby Freeze*, could be read and performed. Dance Central effectively uses this associative technique by providing names for all movements in the game as helpful cues for players to remember and rapidly recall. The names are shown along with a pictogram of the corresponding movement intended to help the player anticipate the upcoming move. Some dance steps in the game are clearly

inspired by, or taken directly from hip-hop dance styles but for some reason are named something different in the game. This discrepancy confuses players who are familiar with these dance steps and removes the lineage thereby de-legitimizing it.

The first Dance Central release features the song, *Don't Sweat the Technique* by Eric B. & Rakim, released on June 23, 1992, by MCA Records. This song is a Breaking anthem that is a commonly played at Breaking events and one that B-boys and B-girls often know by heart. The DC choreographer hinted at this being a break song by including several top-rock steps in the routine, two examples are:

- *Kick step side (Salsa Rock, Salsa Step, Latin Rock)*
- *B-boy down (Brooklyn rock)*

The names given by DC writers to these steps are listed above with the original name beside in brackets. A clear discrepancy can be seen in how terminology can be used to name steps and points to two different schools of thought: a name either tells the history of the move situated within the dance culture or something of the nature of the step itself. The first example of the Salsa Rock, tells of the heavy Puerto Rican influence that Latin social dances had on breaking's *standing dance*, the top-rock. It connects the movement with its historical roots and to the social dance forms of the people who contributed to the creation of breaking.

Also because the move was adapted from another dance style, naming it Salsa Rock or Salsa Step is like a citation.[22]

DC's use *kick step side* instead of *Salsa Rock* is a way of exposing the physical components needed to perform the move – *kick* then *step* to the *side*. This naming system gives information about where to position the body and makes the move more teachable in a short amount of time, however it presents the very real possibility of cutting the movement off from its roots. Another example of this is the *Brooklyn Rock*, in DC called the *B-boy down*. Brooklyn Rock indicates this move heralds from Brooklyn and the proliferation of this move points to how significant this neighbourhood has been in the development of breaking. It could be said that the name *B-boy down, which brings to mind the* image of the quintessential b-boy

(masculine) moving in a downward motion, is a powerful enough symbol to represent the whole of the form of breaking.

However while naming it B-boy down, instead of Breakdance down could be considered as an authentic gesture, attributing this move to the whole of breaking is incorrect. Today the *Brooklyn Rock* is danced by breakers everywhere, nevertheless credit should be given to the neighbourhood and people responsible for creating it, especially from commercial sources capitalizing on the familiarity of this move.

B-boy Kwik Step was asked by Strife.tv whether or not the original philosophy of breaking was being lost through the generations and what role, if any, commercialization played in how the culture was evolving, he answered:

> You have a lot of people in place who are coming from not just doing moves on the floor but are coming from a place of a being part of a movement. In other words it comes from a socialized movement, the movement of a people…being part of a movement is not hard to keep alive if people understand the roots and the roots of this come from the community of people. As long as there is communication and unification of a people then the roots of this movement will never break down. (Step)

Kwik Step is saying there should be a balance between commercialization and the underground, and that if there remains an open line of communication and unity then there won't be a problem of the culture being destroyed. In some instances Dance Central seems to strive for a level of genuineness as in the way they recognized *Don't Sweat the Technique* as a break anthem and even included steps from the original dance. However they missed the mark twice, once when they changed the original names of the steps, isolating them from their roots and second when they combined different styles of movement within individual choreographies, which contributed to a branding of the media street aesthetic mentioned earlier.

Historically hip-hop has been attributed to promoting negative behaviours such as vandalism, misogyny and violence. This belief has been so prevalent Tricia Rose dedicated her second book, *The Hip-hop Wars*, to debunking some of the most common misconceptions about hip-hop (Rose, The Hip-hop Wars). Perhaps by distancing these dance steps from their controversial cultural roots they can be more easily enjoyed and consumed as a form without having to address how and why this culture has been pitted as deviant or having to acknowledge the problems that this causes for practitioners of the art form.

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[5] http://www.grand-nce.ca/

[6] Studio Sweatshop was originally opened by Helen Simard and me then eventually it became my solo venture.

[7] The street dances including Locking, Popping, Breaking, House, Waacking, Krumping and Hip-hop dance.

[8] I learned to break by attending local practices with my crew, learning from peers and mentorship. I have also travelled to international breaking events and learned from dancers abroad.

[9] A cypher is a dance circle where one dancer enters the circle at a time.

[10] The 6-step is a Footwork move where the b-girl/b-boy begins in a low, crouched orientation while the feet walk a circular pattern of 6 steps around the hands, which remain within the center of the circle and are used as points of balance on the floor. There is only one moment where the two hands are both on the floor at the same time, when the legs are extended behind the dancer, otherwise the dancer is shifting her weight from one hand to the other in order to move the legs freely. The torso of the dancer usually remains facing forward as the legs move around the body – front, side, behind, other side – either clockwise or counter-clockwise.

[11] A 5-step variation is where the fifth step of the 6-step is skipped, instead of stepping on the fifth movement the dancer instead jumps through to the sixth step with a forward outstretched leg.

[12] A cc footwork move is where the dancer rolls onto the foot of an outstretched leg while kicking the other foot into the air, the hands are placed either both on the floor to the outside of the outstretched leg, or with one hand on the floor and the other in a stylized position either placed on the head, the hip or in the air.

[13] Top-rocking is the standing dance of breaking and is heavily influenced by social dances.

[14] Footwork is the low dance of breaking most often performed from a crouched position. The hands are used on the floor for balance or weight bearing as the feet step in patterns around the hands.

[15] A get-down is a way breakers transition from the standing dance of the top-rock to the low level dance of footwork or power. These are pivotal moments in a round

of breaking because it bridges the two states of the dance and must be done smoothly and creatively.

[16] In Alien Ness' book he made a conscious choice to write the book in all-caps and to not number the pages. He says, in the book, this was to emphasize that all the information written in the book was of equally high importance.

[17] The highest advanced players would play on a level that was so fast it required them to lean on a support bar in order to move their legs fast enough. In this case their arms are used as support and not free to add personalized gestures.

[18] Footwork is where the dancer is moving in a low, crouch position with the hands on the floor and the feet moving quickly. Freezes are when the dancer holds a position, usually while balanced on one arm. Power moves are more dynamic, larger moves that require strength and usually momentum.

[19] He argues the player's reactive movements, such as swaying, while playing a game follow some kind of pathology. They engage the body but are not necessarily on purpose.

[20] Another strategy sometimes involves purposely not watching an opponent, however this is more often perceived as an act of disrespect towards that dancer. This shows the other dancer they are beneath your attention and that you don't even need to respond to what they are doing in order to win.

[21] The O.U.R. judging system has five different categories each evaluated by one judge, the categories are: Foundation, Dynamics, Originality, Execution and Battle.

[22] Another top-rock movement that has a name as a citation: The Charlie Rock was adapted from the Charleston dance.

Chapter 4: Movement Design

The following chapter details the design projects I undertook over the course of my degree and explains how these illustrate and informed my research questions. I submit these as a collection of work in the hopes of demonstrating a new framework for movement design in gaming.

Project #1: Hacking Dance Central

Problematic/Dance Central

In this design project I reimagined how to play the popular dance game, Dance Central by addressing the limitations of mimetic interfaces and lack of authorship in choreography. This version plays *telephone* with the choreography as it passes through a second mimetic, but this time human, interface. This playful iteration succeeds at:

- Making the game a four player co-op
- Emphasizing face to face interaction
- Player's as co-authors

This game requires a front facing Kinect and projection screen or tv screen. Ideally two areas should be taped off – one indicating the tracking zone and the second indicating a play zone just outside of the tracking zone. It would be difficult to play this in a home setting because more space is required than what the Kinect tracking usually demands. It's better to play this in a large space and it was first installed in the Concordia black box as part of the Gesture Game Arcade curated by the Technoculture and Games Lab.

Players in the tracking zone face away, with their back to both the screen and the Kinect console. Players inside Play zone face towards the screen and are face to face with the players inside the tracking zone. Play zone players follow the onscreen cues and the tracking zone players follow the play zone players (see figure 3).

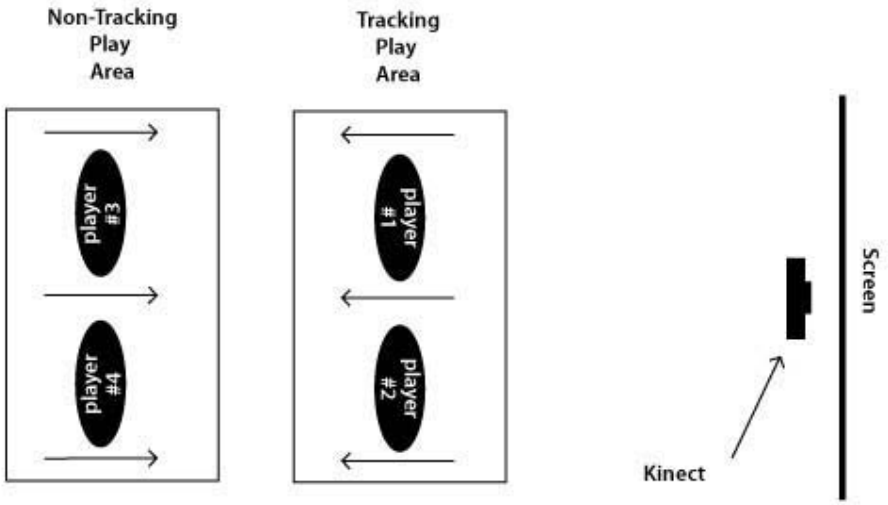


figure 3

Game Solution

Adding a **human reflection** accomplished two things: it elevates players to the level of *co-authors* and creates a new form of *team play*. By playing this game in a manner that it was not designed to be played in, participants can assert their editorial power over the game. As people in the gesture arcade played, they discovered they could rack up more points by making it easier for the person in the tracking zone. Over time they realized that this could be achieved by simply describing the choreography verbally to their teammate.

Project#2: Game Choreography

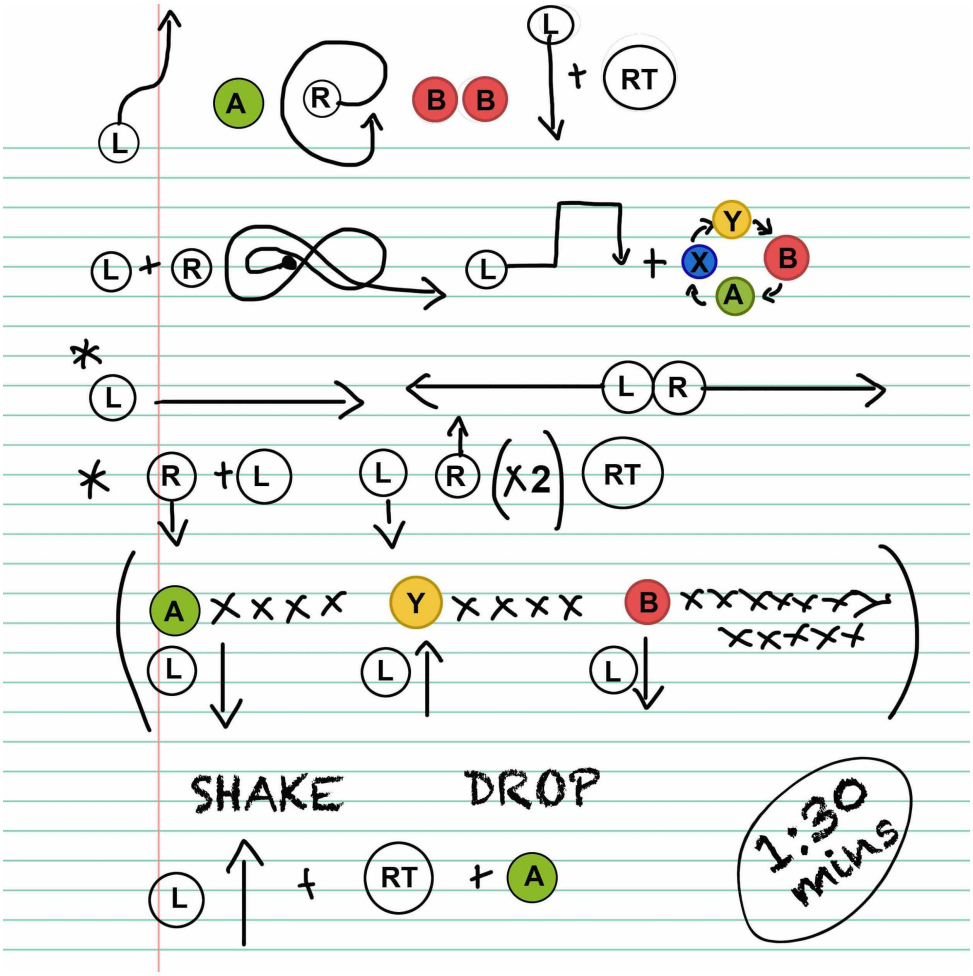
This project calls into question the relationship of choreography to games. It does so by creating a dance script independent from game action and testing the

parameters of the notated choreography against the game code by way of a choreography that is not procedurally motivated.

First I notated the choreography on paper (Figure 4), intended to be danced on an Xbox controller, and then performed the choreography while hooked up to four different game programs. I chose to use only female avatars and that limited the choice of games to those presenting gender as option, for this experiment I used: Mass Effect 2, Tomb Raider, Tony Hawk and Skyrim. The resulting action was recorded and the footage was edited into a short video.

The exercise was designed in order to achieve meaning through the form of the dance itself rather than through an associative connotation with the form of the games and their embedded control schemes. As Kirkpatrick argues, the 'dance script' a player executes is related to "formal sensations…these sensations represent possibilities for experiencing space with a given game program." (Kirkpatrick, Aesthetic Theory and The Video Game 134) He says players "identify in the visual space on screen a kind of receptacle or home for the moves that we have learned to associate with tensions and movements in the hand", such as in the game *Mirror's Edge* "using the left trigger makes Faith crouch...The right trigger makes her punch" (135). Here, dance garners meaning from its association with character actions and their significance in relation to the visual game space. However in my game choreography relates not to a particular game but rather to 'games' and was broadly inspired from game movement itself. I included not only embedded game movements such as joystick manipulation or button-pressing but also collateral player movements such as shaking and dropping the controller. The movements also emerged from the tactileness of the controller, i.e. the spring-loaded snap of the joystick versus continuous input, and also the sounds of a controller i.e. the sound of the controller hitting the floor. Collateral movements such as dropping the controller often arise from emotion based on a variety of situations including frustration from the loss of symbiosis between movement and action within the game program or failure of the controls by faulty player execution or system bugs.

Depending on the game program, some movements in the game's choreography are assigned no relevance and this *inaction* draws attention back to the movement itself rather than on the screen for feedback. "The search for formal patterns that denote a structural affinity between two situations… becomes the basis for selecting appropriate actions, which allow the player to progress in the game. Progression is achieved by matching actions on the controller to these identified affordances of the game program" (137). This dance, however, is not bound by the game code and the resulting game footage is a visual demonstration of how the game choreography is interpreted by each game program. While the choreography is fixed by notation the nature of the notation leaves space for personal expression. Duration is fixed, temporality is flexible; the individual steps are not notated according to any set rhythm but the overall choreography is intended to take approximately one minute and 30 seconds. Figure 4



Project #3: Dance Karaoke

Dance Karaoke references Karaoke and DDR in a way that uses a script of action phrases to suggest movement to the player. The textual interface also explores the concept of choreography as an ergodic text but in this case the player writes and performs the text. In order to step away from the mimetic interfaces of dance games and test a broader spectrum of techniques for conceiving dance and dance notation in games I chose to make this game in Twine, which is software designed primarily for making interactive fiction. There are some formal mechanics that relate to the narrative of Breaking, such as the order in which a dance script can be generated, the way in which a player must succeed at a timed challenge, in the referencing of a cypher battle, the number of times the player has successfully entered the cypher and how well they perform during their turn.

In order to create a freer structure I designed the system so that each time the script is different and the structure is open to interpretation.

I see these *action words* as potential movement systems, their simplicity makes them accessible to a wide audience, but it also allows for repeatability and somewhat predictable results. Dance Karaoke is a performative text and by using this format I hoped to see how movement could be successfully elicited through language rather than through imitation.

Project #4: Designing for dance feel *with movement systems*

Home is Where the Cypher is

Here I have attempted to design a dance game for the Kinect, with repeatable yet motile choreography. The idea being to inspire guided player improvisation, within a program able to accommodate movement variations! I wanted to create a game that was inspired by b*reaking movement systems* and that used free styling as a way of emulating the experience of breaking from the point of view of how it *feels*.

While I did not succeed at making this game the process taught me a lot about game design and production for with the Kinect.

I was able to track circular movement along the horizontal plane by installing the Kinect on the ceiling facing downward. Spinning, and circular moves are defining elements in breaking and even though they are physically difficult, there are some basic moves that in my teaching experience, most able-bodied people can do. Early breakers would perform *back-spins, knee spins, butt spins* etc. ... Spinning moves require various degrees of mastery in terms of timing, strength, flexibility, and technique. The head-spin for example is a highly difficult movement that is both visually impressive and physically risky. As the dance developed the difficulty and/or duration of moves has as well. Dancers now spin for longer and also pull off combinations of spinning moves e.g. backspin to shoulder spin, or head spin to windmill etc… The backspin is the key to understanding many other power moves such as *windmills, coin drops, baby mills*, and more.

Spinning, as a core movement concept, encompasses a vocabulary that is broad enough to allow for various degrees of difficulty. More advanced dancers might spin on certain surfaces of their body, which can make the movement more difficult to master, or they may be able to achieve more rotations by utilizing a greater variety of techniques/methods. Some examples of breaking movements that conform to spinning or circular patterns are:

<u>Circular Moves</u>
Beginner: Coffee Grinder, Run Around, Spin Down/Up
Intermediate: 6,5,4-Step; Zulu Spin, Gremlin
Advanced: 3,2-Step, Swipes,
Ridiculously Difficult: Air Flares, Flares,

<u>Spinning Moves</u>
Beginner: Belly spin, Knee spin, Butt spin, Ninja Kick,

Intermediate: Back Spin, Shoulder spin, Zulu Spin
Advanced: Coin Drops, Wind Mills, Baby Mills, Head mills
Ridiculously Difficult: 1990s, 2000s, Head Spins

Some of the possible game modes are:

- *Virtual DJ* is a mini-game/creative mode, where the player scratches and mixes music through spinning movements.
- *Style Lord* is a challenge that could be played competitively or solo, where the players are given spatial challenges that can be completed in a variety of ways.
- *Break Master* is a mini-game where the player with the highest number of rotations completed within a certain time duration wins.
- *Spin the B-boy/B-girl* could be part of the crew battle co-op mode, where one player winds up and spins their teammate.

Each of these modes gesture towards a valued aspect of breaking: *musicality, creativity, execution* and *teamwork within crews*. The beta version of the game was called the *Style Lord* mode and used balloons, attached to the floor, as spatial markers.

The goal was to touch the balloons in a choreographed, non-sequential order. The intention of the choreography would be to elicit a circular motion from the player in order to succeed at the challenge. To help encourage spinning there was a timed component to the challenge so the player would have to spin quickly, which also increased the difficulty of the challenge. The choreography would be open enough for the player to choose what part of the body they would hit the balloons with: hands, head, or the feet. The challenge of hitting the balloons non-sequentially required coordination, accurate timing and being aware of the body's position in space.

In the second variation of the game the spatial markers were virtual and I wrote a program in Processing, with the help of the technical book *Making Things See* by Greg Borenstein to establish rudimentary motion tracking in the form of 'hotspots'. These hotspots were triggered when a dancer's body part(s) passed through them and a sound was assigned to each individual marker acting as acoustic feedback that measured the player's accuracy.

Project #5: Commercial Movement Design

I have had the extraordinary and timely opportunity of working as *Movement Designer* on two commercial game projects. One game designed for the Kinect and the other for a mobile platform. I believe that exposing how my research informed my approach within the context of these professional projects is an appropriate conclusion to this section.

In each of the projects I used the following steps in my consideration of both the design of the movement control scheme and game feel:

1. Identifying qualitative keywords for how the game should feel to play
2. Finding or making a frame of reference from which to be inspired for movement
3. Classifying the mechanics in the game that need controls
4. Choreographing the movement schema

For the purposes of non-disclosure I will speak broadly about my approach to these games and necessarily avoid specifics. However in my oral defense I will be able show the documents I produced for each of these games, which will give more of a complete picture of my contribution.

<u>Game #1</u>

The Kinect game, which I will refer to as *IF*, had a skeleton control scheme that required the player to hold up their right hand and tap the air with two fingers.

My first thought was that if this remained the control scheme it was a complete misuse of Kinect's potential and the game might as well be played on a PC

with a real mouse. In order to introduce controls that were unique to this game I revisited the movement design process I had used on another Kinect project called Cadere. Cadere was designed by Cindy Poremba using the Kinect gesture controller. Her goal was to create a player experience that felt as much as possible like the sensation of falling. Based on a slow prolonged fall, the player begins to unconsciously trace beautiful patterns with their hands. By design, these patterns can become either part of the shared grand narrative or remain a solo narrative depending on the choice of the player. Players can choose to see either the melded designs generated by previous players or their own design but not both. On Cadere I worked as a design consultant in the pre-production phase of development and I used the Laban approach to movement analysis to test how closely a player's physical experience could reflect the game narrative.

After some thought I concluded that while the body is actually being pulled down by gravity the rush of air creates a feeling of lightness in the limbs.

In the real world if a person were to fall for a long period of time their arms would have a tendency to fly upward, unless they forcefully held them down at their side. In order to achieve this within the context of the game's movement design I decided that most gestures should end in an upward direction. This would contribute to the player visceral experience and result in the creation of dynamic, expressive and nicely patterned arm movements. The start point for the tracks would therefore be somewhere in the lower or middle part of the screen and rise from there in indirect, interestingly aesthetic ways.

In contrast if the arms were held 'down' it would be as is the player was resisting the fall by visually opposing the 'falling' graphics. This might be something to consider and of value in terms of the games 'stop' gesture. Perhaps 'down' should be a part of the stopping gesture i.e. arms up continuing to fall, submitting to the fall in a relaxed way and arms down consciously resisting the fall.

Throughout the game the overall attitude towards time is *sustained* (suggesting an unhurried attitude towards *time*) and even definition of the word cadere suggests a long sustained timeless fall. Even though the player is falling the designer wanted to suggest beauty rather than doom so therefore the player's movements in game play would need to be unhurried. The gameplay is the length of one 'fall' and at the end of the game when the player is about to meet the ground they are faced with a choice. The patterns the player could trace with their hands were *elated* (*light - threadlike - long*) and could either become part of the grand narrative of all the players who have played the game or remain a solo narrative. The end of the game changes the player's relationship with time to *sudden*, which Laban suggests simply indicates a hurried attitude towards time not necessarily how fast you move.

For the game IF I took a similar approach and identified keywords, not necessarily Laban, representing qualities in the narrative: *surrounding, connection, guiding* and *intimacy.* The character is not the player's puppet but rather moves independently with the player helping to facilitate their passing through space. In terms of movement this suggests an intimate protective relationship between player and character. From these keywords I looked for a point of reference to inspire the movement systems and I found it in Tai Chi. I felt the movements of this form were something both men and women could comfortably perform, and the ideology of this style of martial arts is about being grounded, balanced and moving from a center point of energy. I watched videos of Tai Chi practitioners and took my inspiration from a combination of what I saw and the keywords. I choreographed several controls for the first iteration of the design and there are two stand out as unique: hands *surrounding* and *dual hand power-up* control. These controls are different than other Kinect game controls in several ways: often games assign a different control to each hand but in this schema, joining the hands together is assigned a different control than the hands being separate. Rarely do the hands work together for the same goal, but in the surrounding control one hand is aligned

above and one below the character. These controls are easy to learn, easily tracked by the Kinect and also support the narrative of the player as protector of the character and as someone working in symbiosis to achieve success.

Game #2

FK, is a mobile device game about dancing. In my initial research I found most 'dance games' for mobile platforms were in fact rhythm games with specifically mapped on-screen buttons that require finger tapping. Like the rhythm game *Guitar Hero,* the fingers must tap the correct spot either at a certain time or within a certain time frame. The only notable example of a dance game for mobile is *Bounden***,** a two-player game that elicits the feeling of dancing. The most interesting thing about the game is how the players themselves move while playing the game. The game is divided into 'dances that are about the about the length of a song, and within each dance there are shorter problems coinciding with the length of one or two movements. The control scheme and the UI are simple but the beauty lies in moving the mobile device on choreographed trajectories that twist and turn the players. This is an ideal use of a control scheme for a mobile dance game because it feels as though the game-play is inspired directly from the movement. The players discover they are dancing rather than it being prescribed by means of an imitation interface.

In sharp contrast to the primarily frontal facing game-play of mimetic interfaces, Bounden, pushes the parameters of dance gaming by eliciting graceful spins from its' players that move beautifully through 3D real-space. The spatially orientated puzzles are not shown through a gesture-mimetic interface but rather use a touch interface with more visually abstracted movement indicators on how to adjust the position and tilt of the device. This mobile game requires two players to remain physically connected and simulates the feel of a 'pas de deux' in ballet with its intricate twists, turns and sweeping arm gestures. While the game is still reliant on a screen, the mobility of the device and the brilliance of this video game design

require the device be moved in ways that compel players to discover a dance together, rather than it being overtly prescribed.

The keywords I identified for FK were: *spin, slide, jab* and *hold.* In this case the keywords point more specifically towards elements present in the dance style referenced in the game. A particularly exciting element of the game is that the tactile interface creates a tangible connection to the game and the character. My goal with the control scheme was to reinforce that connection and help established a relationship between player motion and avatar motion that stretches beyond simple rhythmic button-pressing triggered actions.

My first contribution to this project was as a design consultant but I have been hired on again to design the control scheme in it's entirety. FK requires a more complex control scheme than IF and because of the complexity of the movement design for FK I have decide on a process that includes the following list of steps:

1. Review all the elements of the game

2. Map all the moves into several categories that reveal different qualities of the movements such as: the shape of the movement (i.e. circular), at what level does the movement happen (high, low, mid) etc...

3. Analyze these categories and assess which are most important to the feel of the game (maybe considering a move as a 'circular low step' is more useful than considering it just a 'circular step') then assign sketch controls (first draft)

4. Map the controls to test how the choreographic sequencing feels in all possible combinations; how the player might use the controls to create pleasing on screen action, then test and revise until a schema starts to emerge.

5. Consider progression and divvy up the control scheme in terms of how the gameplay progresses and test and revise.

I look at movement controls as a choreography reflecting the nature of the dance steps, consider movements as action and how movement makes meaning - a hold feels different than a tap, a slow finger slide feels different than a fast one. For

example simply speeding up or slowing down the same type of control could feel more laid back or more like furious action to the player. It doesn't change the control scheme per se but changes how the game feels to play.

Conclusion

Software is at the heart of digital gaming and all other digital medias, it allows for 'media hybridization' where mediums "merge together to offer a coherent new experience different from experiencing all the elements separately" (Manovich 167) as in the case of dance video games. As Crogan writes, "These contemporary interactive audio-visual systems are central vectors of transformations in what Jonathan Beller has characterized as the 'attention economy' (2006)." (Crogan 82) He continues to say "this capture, channelling and sale of the conscious attention of consumers, has been the mainstay of commercial entertainment and leisure industries since the rise of 'cinematic media'." (82)

Video games capture the attention of consumers and games played with natural movement controllers lean perhaps unsurprisingly towards the gesture controller eliciting more social behaviours than the traditional controller (Lindley, Le Couteur and Bianchi-Berhouze). Dance Central capitalizes on socialization by making the game accessible with several forms of visual notation and verbal cues to facilitate learning. Whereas B-boy engages players differently by successfully incorporating a greater level of authenticity and by providing players with the opportunity to freestyle dance the controls.

Joseph Schloss argues, "…the way the dance is taught exerts a profound influence on the way it is experienced. It affects the way individuals understand the history of the form and their own place in it, the way they express their individual and group identities, and the way they pass this knowledge on to others." (Schloss, Foundation 41) Learning dance in video games is heavily influenced by the type of interface and the corresponding notation, as Sha Xin Wei writes, "Grammar and notation are technologies for structuring symbolic media as much as brush and canvas structure painting." (Sha 21) Translating the visual indicators into movement requires developing literacy in a particular gaming system. In the book, *Reading Dance*, Susan Leigh Foster writes, "in the same way that one learns to read

an essay, novel, or poem, one learns to note such choreographic conventions ...Literate dance viewers, like choreographers, "read" dances by consciously utilizing their knowledge of composition to interpret the performance, and in this sense they perform choreography along with the dancers" (Foster, Reading Dancing: Bodies and Subjects in Contemporary American Dance 57) According to Foster the dance viewers can experience dance in the sense of a performed reading and dance games with mimetic interfaces and visual notation use this to their advantage. If we can understand the visual connotations of choreography in these games as a list of complex action commands then perhaps we could consider it a type of performative text that is indeed executable.

Imitation interfaces are also prime spaces for the "grafting of tastes of affinities to physical locations" (Straw 254) or in this case more specifically to virtual locations. Dance Central grafted experiences to virtual public sites that have been assigned meaning as media venues for the visualization of music. "Within scenes, tastes or affinities become organized as itineraries across series of spaces." These virtual venues housed bits of urban culture bound by a fetishized street aesthetic.

With this research I have dissected the impact that interface and notation have on learning dance in video games and how they have contributed to a preliminary definition of movement design with the intention of carving out more creatively demanding dance games. In my practice based-research I have also made efforts to push forward the expressive potential of game-feel by designing movement control schemes that help to drive the narrative of a game through shaping the psychosomatic experience of the player.

Bibliography

Aby, Bboy and Alien Ness. Interview.
Activision. "Tony Hawk." Tony Hawk series. Neversoft, Robmodo, 1999-2015.
Alexander, Leigh. "You and me become we: Dancing with Bounden." 28 April 2014. Gamasutra. 2014 <http://gamasutra.com/view/news/216285/You_and_me_become_we_Dancing_with_Bounden.php>.
America's Best Dance Crew. Prods. Randy Jackson and Joel Gallen. 2008 -2015.
Amini, Tina. "The Year's Two Biggest Dance Games Are Now Out. Time For A Dance-Off." 16 October 2012. Kotaku. 2013 <http://kotaku.com/5952152/the-years-two-biggest-dance-games-are-now-out-time-for-a-dance-off>.
Arseth, Epsen. Cybertext: Perspectives on Ergodic Literature. London: John Hopkins Press, 1997.
Arts, Electronic. "Boogie Superstar." Montreal: EA Montreal, 14 October 2008.
Barton, James. "B-boy FAQ/Move List for Playstation 2 by barticle." 16 February 2010. GameFAQS. 3 July 2015 <http://www.gamefaqs.com/ps2/932387-b-boyfaqs/59032>.
Batson, Glenna. "Update on Proprioception: considerations for dance education." Journal of Dance Medicine & Science 13.2 (2009): 35-41.
Battle of the Year. By Benson lee, Chris Parker and Brin Hill. Dir. Benson Lee. 2013.
Bayliss, Peter. "Notes Toward a Sense of Embodied Gameplay." Situated Play. DiGRA , 2007. 96-102.
"Bboy Game Wiki." 17 March 2014. Giant Bomb. 2014 <http://www.giantbomb.com/b-boy/3030-9778/>.
Bboy Magazine. 2012. 2014 <http://www.bboymagazine.com/article/krazy-kujo-interview/>.
Behrenshausen, Bryan G. "Toward a (Kin)Aesthetic of Video Gaming: The case of Dance Dance Revolution." Games and Culture (2007): 335-354.
Bill T. Jones, Paul Kaiser, and Shelley Eshkar. Open Ended Group. 1999. 2014 <http://openendedgroup.com/artworks/gc.html>.
Birringer, Johannes. "Dance and Media Technologies ." PAJ: A Journal of Performance and Art 24.1 (2002): 84-93.
Bogost, Ian. Pursuasive Games: The Expressive Power of Videogames. MIT Press, 2007.
Borenstein, Greg. Making Things See. Sebastopol: O'Reilly Media Inc. , 2012.
Brathwaite, Brenda and Ian Schreiber. Challenges for Game Designers. Boston: Course Technology, 2009.
Brezinski, Jessa. "Practice makes perfect in dance central spotlight." 17 September 2014. Harmonix Music. 2014 <http://www.harmonixmusic.com/blog/practice-makes-perfect-in-dance-central-spotlight/>.
Chang, Jeff. Can't Stop Won't Stop. New York: Picador, n.d.
Chun, Wendy Hui Kyong. "On "Sourcery," or Code as Fetish." Project Muse 16.3 (2008): 299-324.

Condry, Ian. Hip-Hop Japan: Rap and the Paths of Cultural Globalization. Durham: Duke University Press, 2006.
Cooper , Martha, Kramer Nika and Rokafella. We B*Girlz. New York: Power House Books, 2005.
Crawford, Victoria K. Gosling and Garry. "Game Scenes: Theorizing Digital Game Audiences." Games and Culture (2010).
Crogan, Patrick. "The Nintendo Wii, Virtualisation and Gestural Analogics." Culture Machine 11 (2011): 82-101.
Cuddy, Luke and John Mordlinger. World of Warcraft and Philosophy. Chicago: Open Court, 2009.
deLahunta, Scott. "Virtual Reality and Performance." PAJ: A Journal of Performance and Art 24.1 (2002): 105-114.
Delamere, Fern M and Susan M Shaw. "Playing with Violence: Gamers' social construction of violent video game play as tolerable deviance." Leisure Loisir (2010): 7-25.
Dewhurst, Stephen. "The Genre Blender: Experiements in Social Gameplay." Gamasutra. <http://www.gamasutra.com>.
Dils, Ann. "The Ghost in the Machine: Merce Cunningham and Bill T Jones." Performing Arts Journal 24.1 (2002): 94-104.
Dodson, Joe. "B-boy Review." 4 September 2008. Game Spot. 2015 <http://www.gamespot.com/reviews/b-boy-review/1900-6197138/>.
Entertainment, Konami Digital. "Dance Dance Revolution." Konami, 1998.
Flashdance. Dir. Adrian Lyne. 1983.
Fogtmann, Maiken Hillerup, Jonas Fritsch and Karen Johanne Kortbek. "Kinesthetic Interaction - Revealing the Bodily Potential in Interaction Design." OZCHI . Cairn: CHISIG, 2008.
Foley, Mary Ann, et al. "the effects of enactive encoding, type of movement, and imagined perspective on memory of dance." Psychological Research (1991): 251-259.
Forman, Murray and Mark Anthony Neal, That's The Joint. new York: Routledge, n.d.
Foster, Susan Lee. Reading Dancing: Bodies and Subjects in Contemporary American Dance. Berkley: University of California Press, 1986.
—. Taken By Surprise. Ed. Ann Cooper Albright and David Gere. Middletown: Weslyan University Press, 2003.
Games, Evolved. "B-boy." FreeStyle Games, 2006.
Gee, James Paul. What Video Games Have to Teach Us About Learning and Literacy. n.d.
Gibson, J. J. The Senses Considered as Perceptual Systems. Boston: Houghton Mifflin Company, n.d.
Glyde, Kid. " How to Do the Toprock Side Step B-Boy Dance Move ." Howcast. Howcast, 2015.
Gosling, Victoria K. and Garry Crawford . "Game Scenes: Theorizing Digital Game Audiences." Games and Culture 6 (2010).

Harmonix. "Dance Central ." Dance Central 1, 2, 3, and Spotlight. Boston: Microsoft Studios, 2010-2015.
Haynes, Jeff. " B-Boy Review Don't pop lock and drop this game into your PS2. ." 18 August 2008. IGN. 2015 <http://ca.ign.com/articles/2008/08/19/b-boy-review?page=2>.
Hebidge, Dick. Subculture; the meaning of style. London: Routledge, 1979.
"How to Breakdance - Ruffneck Attack Tutorial - Powermove Level." Breaking Teacher. YouTube, 3 May 2015.
"Hugo Savard - Massive Monkees Compilation." 14 January 2010. YouTube. 2014 <https://www.youtube.com/watch?v=i_PHno0uSOs>.
Ito, John Paul. "Repetition Without Repetition: Bernsteinian Perspectives on Motor Learning for Musicians." College Music Symposium 51 (2012).
Jenson, Jennifer and Suzanne de Castell. "From Simulation to Imitation: New Controllers, New Forms of Play." Breaking New Ground: Innovation in Games, Play Practice and Theory. DiGRA, 2009.
Jones, Steven and George Thiruvathukal. Codename Revolution: The Nintendo Wii Platform. Cambridge: MIT Press, 2012.
Jongh, Adriaan De. "Postmortem: Game Oven's Fingle." 4 November 2013. Gamasutra. 2014 <http://gamasutra.com/blogs/AdriaanDeJongh/20130411/190268/Postmortem_Game_Ovens_Fingle.php/>.
Just Dance. "Behind the Scenes - The Making of Just Dance 4." YouTube, 3 October 2012.
Juul, Jesper. A Casual Revolution. Cambridge: The MIT Press, 2010.
—. "What computer games can and can't do." Digital Arts and Culture. http://www.jesperjuul.net/text/wcgcacd.html, 2000.
Kirkpatrick, Graeme. Aesthetic Theory and The Video Game. Manchester: Manchester University Press, 2011.
—. "Controller, Hand, Screen: Aesthetic Form in the Computer Game." 2009. http://gac.sagepub.com. 2011 <http://gac.sagepub.com/cgi/content/abstract/4/2/127>.
Laban, Rudolf and Lisa Ullman. The Mastery of Movement. Vol. 4. Alton: Dance Books, n.d.
Lindley, Siân , James Le Couteur and Nadia Bianchi-Berhouze. "Stirring up Experience through Movement in Game Play: Effects on Engagement and Social Behaviour." CHI. Florence, 2008. 511-514.
Mäyrä, Frans. "Getting into the Game: Doing Multidisciplinary Game Studies." Perron, Barhard and Mark J.P. Wolf. The Video Game Theory Reader 2. New York: Routledge, 2009. 312-329.
MacDonald, Keza. "Just Dance 3 Review." 11 October 2011. IGN. 2012 <http://ca.ign.com/articles/2011/10/11/just-dance-3-review>.
Manovich, Lev. Software Takes Command. New York: Bloomsbury, 2013.

Mary Ann Foly, Veronica Bouffard, Tarja Raag, Mary DiSanto-Rose. "The effects of enactive encoding, type of movement, and imagined perspective on memory of dance." Psychological Research 53 (1991): 251-259.
Massumi. Parables for the Virtual. Durham: Duke University Press, 2002.
Mead, George Herbert. Mind, Self & Society. Ed. Charles Morris. Chicago: University of Chicago, 1934.
Merleau-Ponty, Maurice. The World of Perception/Causeries. Trans. Oliver Davis. This translation first published by Routledge in 2004. New York: Routledge, 1948.
Miyamoto, Shigeru. "Wii Bowling." Nintendo, 2006.
Monfort, Nick and Ian Bogost. Racing the Beam. Cambridge: MIT Press, 2009.
Monkees, Massive. "Blogging ABDC - Massive Monkees Audition for America's Best Dance Crew Season 4 ." YouTube. <https://www.youtube.com/watch?v=47JwVS6zE08>.
Nansen, Bjorn. "Exertion Gaming as Kinaesthetic Technicity." Second Nature (2009): 65-91.
Ness, Alien. The Art of Battle: Understanding Judged Bboy Battles. Independant, 2007.
Parkin, Simon. "B-boy Review - PSP reviews." 4 October 2006. Pocket Gamer. 2015 <http://www.pocketgamer.co.uk/r/PSP/B-Boy/review.asp?c=1658>.
Pecknold, Adrian. Mime: The Step Beyond Words. Toronto: NC Press Ltd. , 1982.
Planet B-boy. Dir. Benson Lee. 2007.
Robitzky, Niels "Storm". Merchandise. 2006. 2014 <http://www.stormdance.de/?cat=4>.
Rose, Tricia. Black Noise. Middletown: Wesleyan University Press, 1994.
—. The Hip-hop Wars. New York: Basic Civitas, 2008.
Schloss, Joseph. Foundation. New York: Oxford University Press, 2009.
Schloss, Joseph. "The Art of Battling: An Inteview with Zulu King Alien Ness." Chang, Jeff. Total Chaos. Ed. Jeff Chang. New York: Basic Civitas, 2006. 27-32.
"SEVEN TO SMOKE BGIRLS (EVOLUTION EUROPE 2012) ." Bboy World. 2012.
Sha, Xin Wei. Poesis and Enchantment in Topological Matter. MIT, 2013.
Sheffield, Brandon. "Harmonix's new jam is Chroma: A beatmatching first-person shooter ." 17 February 2014. Gamasutra. 2014 <http://gamasutra.com/view/news/210986/Harmonixs_new_jam_is_Chroma_A_beatmatching_firstperson_shooter.php>.
Simon, Bart. "Wii are out of Control: Bodies, Game Screens and the Product of Gestural Excess." Montreal, October 2008.
Smith, Jacob. "Digital Dance Hall: The Fan Culture of Dance Simulation Arcade Games." Consuming Music Together: Social and Collaborative Methods of Music Consumption Technologies. Ed. Barry Brown Kenton O'Hara. Springer, 2006. 193-209.
Step Up. Dir. Anne Fletcher. Prod. Jennifer Gibgot, Adam Shankman, Patrick Wachsberger Erik Feig. 2006.
Step, Kwik. Interview with Strife.tv. Strife.tv. 10 April 2010.
Straw, Will. "Scenes and Sensibilities." Public. Vol. 22/23. 2002. 245-257.

Swink, Steve. Game Feel - A Game Designer's Guide to Virtual Sensation. Burlington: Morgan Kaufman Publishers, 2009.
Thresher, Alli. "E3 2014: Dance Central Spotlight - Alli Thresher Interview." https://www.youtube.com/watch?v=v-yUD3BNpAM. gamereactorTV, 22 July 2014.
Timothy D Lee, Laurie R Swanson and Anne L Hall. "What Is Repeated in a Repetition? Effects of Practice Conditions on Motor Skill Acquisition." Physical Therapy Journal 71 (1991): 150-156.
Ubisoft. "Just Dance." Just Dance 3, Just Dance 2015. Ubisoft, 2009 - 2015.
Ventrice, Tony. "Gamification Dynamics: Growth And Emotion." Gamasutra. 16 12 2011 <http://www.gamasutra.com/view/feature/6547/gamification_dy>.
Watters, Chris. "Dance Central review." 4 November 2010. Game Spot. 2012 <http://www.gamespot.com/reviews/dance-central-review/1900-6283598/>.
Who's Hungry. By Joe Danny Aurlien. Perf. b-boys/b-girls. Sala Rosa, Montreal. 2010.
Who's Hungry. By Joe Danny Aurlien. Perf. Red Mask Crew. Sala Rossa, Montreal. 2008.
Wild Style. Dir. Charlie Ahearn. 1982.
Williams, Mike. "Just Dance 2014 Review." 17 October 2013. US Gamer. 2013 <http://www.usgamer.net/articles/just-dance-2014-review>.
You Got Served. By Christ Stokes. Dir. Chris Stokes. 2004.
Zimmerman, Eric. "Gaming Literacy Game Design as a Model for Literacy in the Twenty-First Century." Video Game Theory Reader. n.d.