

DIGRA

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Research Association**

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ToDIGRA

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Introduction

The *Transactions of the Digital Games Research Association* (ToDiGRA) collects some of the finest work presented at the DiGRA conferences. This issue continues in that tradition, and further acknowledges the breadth and variety of the scholarly work presented at the 2014 edition of the DiGRA conference held in Snowbird, Utah (August 3-6). We want to recognize that scholarly work of importance and impact can often extend beyond the confines of the traditional written paper. For example, DiGRA 2014 hosted the inaugural *Blank Arcade*, a curated exhibition of experimental, artistic and thought-provoking games (digital and analog), and interactive experiences (Grace 2014). Similarly, there were numerous panels and discussion sessions with significant effects and outcomes. We have invited Drs. Shira Chess and Adrienne Shaw to reflect upon one of these sessions: their fishbowl discussion session “The Playful is Political”.

In the spirit of transparency, we feel it is important to disclose how we selected the entries for this issue. As is customary at DiGRA conferences, all the full-papers were double-blind peer-reviewed. As part of this process, each paper is assigned a score that is calculated based on the individual reviewer’s scores and his/her self-disclosed level of expertise on the papers’ topic. The conference program committee (which we were not involved in) uses the text of the review, the scores, and other factors (e.g. program committee discussions and author’s rebuttals to the initial reviews) to make the appropriate acceptance/rejection decisions for each paper. For this special issue, we took the papers with the highest overall scores, and invited their authors to submit their work. Those authors who accepted our invitation submitted their papers, and we (the editors) had the papers blind peer-reviewed again. The goal here was to provide feedback that would help with necessary improvements for

the “archival” format, which this journal provides. It was essential (depending on the results of the review) that the authors significantly revised their articles before the articles were accepted for publication in this special issue.

It gives us great pleasure to share with you the results of this additional effort by our invited authors, who have chosen to revise and improve their work in order to appear in this issue. We believe they represent an interesting sample of the breadth and excellence of the research that DiGRA has to offer. In this issue, Daniel Vella uses narratology and literary theory to argue for a closer examination of game characters as both individual and semiotic constructions. Gareth Schott and Raphaël Marczak share insights and results from a study that examined the use of biometric measures as a guide for determining which aspects of a game have the most impact on players. John Salisbury and Penda Tomlinson challenge the use of Csikszentmihalyi’s (1991) notion of flow in game studies by articulating the apparent contradictions in its use, and provide us with an enhanced notion, value based flow, which may be more productive for examining videogame playing. Finally, Dylan Lederle-Ensign and Noah Wardrip-Fruin demonstrate how a platform study of the idTech3 game engine can allow us to better understand and describe famous virtual physics phenomena such as strafe jumping.

Games research has never been this deeper, richer or even, arguably, more controversial. We are proud that ToDiGRA and DiGRA 2014 demonstrate how quality creative work, games scholarship, and public intellectualism can, and do fit under the umbrella of games research.

José P. Zagal and Roger Altizer

ACKNOWLEDGMENTS

We wish to thank the anonymous reviewers who participated in the creation of this issue, the volunteers who donated their time and

effort, and the conference sponsors, who all helped make DiGRA 2014 a success.

REFERENCES

Csikszentmihalyi, Mihaly. 1991. *Flow: The Psychology of Optimal Experience*. New York: Harper Collins Publishers.

Grace, Lindsay, ed. 2014. *Blank Arcade: Exhibit Catalogue at DiGRA 2014*. DiGRA.

On Chairing a Games Research Conference

Jose P. Zagal

INTRODUCTION

Chairing an academic conference, especially one like DiGRA, is a great honor and a great responsibility: it grants you a fair amount of power, at least for a short amount of time. I thought I would take advantage of that power and this platform to share my personal thoughts and opinions on what it means to run an academic conference in this field. In doing so I hope to clarify some of the things that, to me at least, were opaque about the process of chairing a conference. While I knew that chairing was a lot of work, understanding what that work was, how things should be done, and why they should be done a certain way was not clear to me until I was in the middle of it all. I hope that what follows serves two purposes: (1) clarify some of what is involved in chairing a conference in hopes that others (including students and new members to the field) can better understand some of the practices of this academic community and (2) encourage reflection and discussions on our practices and how they could be improved.

I am under no illusion that my opinions (and actions) are the “best” or “only” way to do things. However, I think that we, as a community, should allow ourselves more opportunities to reflect on our practices. We have gathered, under this “tent” we call games research, a wide variety of scholars who come from an equally diverse set of scholarly traditions. Different communities do things differently for a variety of reasons. We find ourselves (in games research) in a position where we can pick and choose to do what we feel is best for our community.

The challenge is that we have to pick and choose things that make sense for everyone involved as well as the field in general.

But more on that later.

For now, allow me to briefly describe my history with games research and its academic community in order to provide some context for what will follow.

I have been participating in games research since the late 1990s but only became aware of the game studies academic community in the 2000s while pursuing my PhD degree. I have attended all the primary DiGRA conferences since Vancouver in 2005. I have been a volunteer for the organization since about that time as well. Initially I served as “Coordinator” (updating the website with news items, something I continue to do) and from 2006 onwards I have worked as a member of DiGRA’s executive board. In addition to serving as conference chair for DiGRA 2014 (with Roger Altizer), I served as conference chair for the 2015 edition of the Foundations of Digital Games Conference (FDG) – a sister conference and allied community to DiGRA. DiGRA’s 2016 conference will be jointly held with FDG). Again, I only bring this up to establish that I’ve been around DiGRA for a while now in a variety of roles and capacities.

HOW DIGRA ORGANIZES ITS CONFERENCE

One of DiGRA’s primary activities is the organization of a yearly conference. The decision that a conference should be held is made by DiGRA’s board who then distribute a “Call for Hosts”. This call allows people who would like to host a DiGRA conference identify themselves (to the board) and make a case for why they should be the ones to organize it. While the call is open, it is often the case that members of the board will contact people they think might be interested in hosting as well. In my experience, while there may be a handful of interested parties, you usually end up with only one or two complete applications. The board then reviews the applications, talks to the potential hosts to suggest changes or clarify things, makes

a decision, and then signs a contract with the hosts to clarify each party's responsibilities. The hosts are also referred to as the local organizers and the *Conference Chair* (or general chair in other fields) is one of them.

The final decision on who the conference host will be is based on a combination of factors. I would say the primary ones include: how well-known, respected, and trusted the local organizers are; how much support the local team can count on; where the last conference was held; ease of access to the venue/location; and the expected expense of the conference to attendees. Some guiding principles include:

- Ideally, the conference should move around (different continents) to allow a broader diversity of attendees.
- The conference is not conceived as a significant revenue stream for the organization. Thus, registration should be kept as low as possible (while covering all the expenses). Cheaper registration for students is also expected.
- The conference is an opportunity to encourage local interest and scholarship in game studies.

The host selection process for DiGRA 2014 was different than usual. As early as 2008, DiGRA's board (I was on the board at this time) had been trying to transition to a yearly conference schedule. The plan was for DiGRA's yearly schedule to begin in 2010 following the 2009 conference hosted by Brunel University in West London, UK. Unfortunately this was not possible, but the biennial calendar was maintained with DiGRA 2011 (Hilversum, The Netherlands). We (DiGRA's board) were unsuccessful in going yearly again (for 2012), but fortunately Georgia Institute of Technology was able to host DiGRA 2013 (Atlanta, Georgia, USA). Having failed twice to establish a yearly schedule, the board decided to forgo the public call for hosts and instead entertained two board-member suggested alternatives for hosting DiGRA 2014. After internal discussion, the

2014 DiGRA bid went to Snowbird, Utah (hosted by the University of Utah's Entertainment Arts and Engineering Program). Now that the yearly calendar has been established the usual open calls for hosts have resumed with DiGRA 2015 hosted by Leuphana University in Lüneburg, Germany and the next host (2016) will be Abertay University in Dundee Scotland.

HOW THE CHAIR SHAPES THE CONFERENCE

The academic program is the heart of an academic conference. It is where we learn about each other's work and where we establish our academic reputations and careers. The conference's academic program consists of all the papers and presentations at the conference that went through a formal submission process, were peer-reviewed anonymously, and were discussed and accepted by the conference *program committee*. The people in charge of the call, review, and selection processes are the *Program Chairs*. DiGRA usually has two program chairs one of whom served as program chair for the previous conference. This allows for institutional knowledge to be informally preserved and passed on. The Program Chair's job is to make sure that the academic program is of the highest quality, that all the papers go through a rigorous and fair blind peer review process (by assigning and recruiting reviewers), and that the resulting selection of papers and presentations represents the best work being done in the community. Despite the importance of the academic program, it is important to keep in mind that:

The Conference Chair has nothing to do with the Academic Program

My job, as *Conference Chair*, was to ensure that (1) the conference was great, (2) lots of people came to the conference, and (3) we didn't lose any money. The financial side of things is the main reason why the conference chair is not involved in the academic program (not even as a reviewer): there's a conflict of interest. Bluntly put, the conference chair wants high acceptance rates (presumably so more people will attend the conference) while the program chair wants low acceptance rates (presumably for a higher quality program). While

some academic communities are large enough that they can enjoy both really low acceptance rates and large attendance conferences, this is not currently the case in games research. So, the conference chair needs to coordinate closely with the program chairs because the financial viability of the conference is significantly in their hands – not only in terms of how many people will attend, but also because the program will determine many of the conferences’ significant expenses (e.g. need to rent space and A/V equipment).

As a side note, being chair of the conference also introduces an additional issue: is it ethical for a conference chair to submit their own research to the conference they are running? The academic integrity issue (e.g. was a paper accepted because the author was the conference chair?) can be handled appropriately via the anonymous review process. However, because the conference chair determines the schedule, there are other opportunities for abuse (e.g. cherry-picking the best time slots for his/her own presentations). However, even when managed correctly, it is still possible for people to get the wrong impression. Thus, I think it is best for the conference chairs to not submit their work to the conference they are chairing when they are the primary author. I recognize that the cost of doing so can be significant in terms of their own research productivity. It is also a thorny issue when considering co-author situations, a conference chair who does not submit their co-authored work to a conference is also denying the opportunity of doing so to their students, advisees, and collaborators.

Even if a conference chair has not submitted anything to the academic program, he/she still has other means for shaping the overall “feel” of the conference. For example,

The Conference Chair Decides the Theme of the Conference

While the board needs to approve it, in practice the local organizers have a lot of freedom in deciding on the theme of the conference. An attractive (interesting, topical, etc.) theme can draw people to the conference who might not otherwise attend and it serves as a way of

setting a research agenda for the community. Conference themes are generally broad and inclusive.

I am not sure how much theme matters in the end. DiGRA 2013's theme was "Defragging Game Studies" and I do not know how many people registered because of the theme, or how many people wrote papers addressing or inspired by the theme. I'll admit that for 2014, I was surprised by the number of submissions that reflected, in their titles at least, the theme of the conference "<Active Noun> the <Verb> of game <Plural Noun>". Roger Altizer, myself, and some of our local staff/volunteers decided that our theme should be playfully generic so as to offer light commentary (a quip, if you will) on conference themes. In hindsight this was a bad idea because the use of "<" and ">" caused some technical issues later on. On the other hand, Ian Bogost created a Twitter bot (@DiGRAThemes) that is still actively creating new conference themes so I guess that was a win.

In addition to the theme, the conference chair also shapes the conference by deciding what happens when. In other words,

The Conference Chair Sets the Schedule

While the dates of the conference are discussed at length with DiGRA's board, the day-to-day schedule is entirely in the hands of the conference chair. I would describe the process of putting together the schedule as a logistical nightmare rather than a wonderful tool for "setting an agenda". In a nutshell you have to group papers/presentations into sessions using limited space (and time) in such a way that each session makes sense (or is coherent) and no laws of physics are violated (e.g. someone can't be in two places at the same time). On the surface this doesn't seem too difficult – the submission process requires that people submit their work to specific tracks, so grouping papers by tracks might be a good place to start. However I think that this can lead to missed opportunities for interaction. In larger conferences (i.e. those with multiple parallel sessions) with clearly delineated tracks/themes I've found that attendees will identify a track as "their track" and only attend those sessions. Doing

so can discourage some of the serendipity that I find so valuable when I hear a talk about work that was unexpected to me and even perhaps slightly outside of my comfort zone simply because it was related somehow to another talk I was interested in attending.

For DiGRA2014 (and also FDG2015) I implemented an “open card sorting” style method for organizing the sessions. I printed the title of each accepted submission on a slip of paper and then, together with a group of staff/volunteers we iteratively organized the slips of paper into piles or groups that “seemed to go together”. I didn’t provide any explicit instructions other than to try to get to groups that “made sense” (without explaining what that meant). Once that was done, I distributed the groups (now “sessions”) over the various days and times. My goal was to stay within the constraints I had and also try to “spread things out” such that there was a variety of topics, themes, etc. distributed over the entire duration of the conference. I wanted to avoid having, for example, all of the “games and education” papers on the first day. Surprisingly, for me at least, one of the greatest challenges in creating the schedule was dealing with all of the requests for changes as well as the people who withdrew their submissions from the program. This led to a lot of shuffling around to ensure “full” sessions while also maintaining the hard work in grouping presentations into sessions.

Based on feedback I received during and after the conference, it seems to have worked well in meeting these goals:

1. Session attendees should understand why presentations in a session are together (even if that “sense” is different for each attendee)
2. Highlight the diversity of game research by distributing presentations on similar themes, topics, etc. over the entire conference
3. Encourage opportunities for cross- and inter- disciplinary

interactions (i.e. serendipitously running into a presentation you weren't originally interested in)

In addition to deciding the schedule of the academic program sessions, there are other items on the schedule that a conference chair can leverage,

The Conference Chair is Responsible for Social Events

I am of the opinion that the more events there are (ideally something every evening), the better. The role of these events varies, but generally includes creating opportunities for attendees to meet and network with each other, providing an opportunity for a memorable experience (usually one that takes advantage of a local resource/attraction), and providing an opportunity for attendees to participate in a field-related activity they might not have the chance to engage in otherwise. Which events make the most sense for a particular DiGRA conference will vary depending on the location and opportunities available. Below are some events that I think have been successful in the past:

1. **Graduate Student Mixer** – this is usually held the night before the conference starts officially. It's usually organized by DiGRA's student representatives and generally consists of meeting at a bar (or similar venue) for drinks. Drink tickets are generally available for DiGRA students though non-students also participate.
2. **Boardgame Night** – play board games into the early hours. Attendees usually bring games they'd like to play, though it helps when there are some games available. Also, people often bring prototype games for playtesting and feedback.

3. **Conference Game Jam** – attendees, usually in groups, design and develop a game in a very short period of time. This is a great opportunity to engage with, and practice game design and development.

4. **Tour/Visit Local Venue of Interest** – normally this is something like a visit to a local museum or gallery, but it can also include visits to a local game studio or a historical venue.

While I have had plenty of wonderful experiences at “Conference Banquets” in the past, I have found that these events sometimes flounder when they require separate registration (and payment) because they can create a division between the conference attendees. On the other hand, providing catered social events with an open bar (even if limited to a short amount of time) can present a significant financial burden to the conference organizers. In that sense, I think it’s better to have a fewer events so long as they are open to all, rather than more events requiring additional payment/registration.

In addition to the social events,

The Conference Chair Decides who the Keynote Speakers Should Be

I think that DiGRA’s conferences generally work well with three keynote speakers where each fulfills different roles in the conference program:

1. **The Insider** speaker is someone who is well-known in the community and the field and whose work is valued and respected. This speaker’s keynote will hopefully inspire and speak to the field at large – perhaps outline future directions of inquiry, discuss current “big picture” issues, or reflect on

the past in a way that re-focuses the present and looks to the future.

2. **The Outsider** speaker is someone who isn't a member of the community but whose work might be of interest or significance to the community. They are often "senior" or important members of another field. This speaker's role is one of bridge-building: help establish connections between areas or communities that might not otherwise be aware of each other. Their work, while not necessarily about games, might be useful or interesting to game researchers.

3. **The Industry** speaker is also an outsider of sorts. This speaker can provide the academic community with insights from their professional practice. It is also a bridge-building keynote, but this time between industry and academia.

There are other concerns that need to be taken into account when selecting and inviting keynote speakers. For instance, there are financial considerations: the conference generally covers speakers' travel and accommodation expenses, and sometimes a modest honorarium. Past keynotes are also important: having "repeat" speakers from prior conferences is usually not good. Similarly, speaker diversity is important.

A third area of influence the conference chairs can use to affect the academic feel of the conference lies in events and sessions that lie outside of the regular academic program.

The Conference Chair can Organize, Invite, Include Things that are Outside of the Regular Academic Program

By inviting people to organize "special interest" sessions, the conference chair can complement the main academic program. It is

also a good way to boost registration numbers by drawing attendees who would not have otherwise attended.

DiGRA2014 hosted a *Well-Played Summit* that featured close readings and explorations of exceptional play created by a single game, an *RPG Summit* featuring research focused on role-playing games and opportunities to play indie tabletop RPGs, and a creative games showcase, *The Blank Arcade Exhibit*. These special-interest events were organized by Sean Duncan, David Simkins, and Lindsay Grace respectively. They each managed their own submission, peer-review, and selection process. In a sense, these were mini-academic programs that ran alongside the main conference program and as such they had their own proceedings.

These “special program” events and sessions serve an important role for the community. First, they provide a space for special-interest groups to gather and create community (e.g. the RPG Summit gathered RPG scholars). Second, they allow for the community to experiment with new and different presentation formats outside of the traditional papers and posters. Finally, they provide a way to increase diversity in terms of styles of scholarship and work. The Blank Arcade served this role by attracting artists and practitioners for whom the usual submission categories (paper or abstract) don’t make sense. Experimenting with additional conference submission formats is important. In fact, the call for papers for DiGRA 2014 included the following:

Conference Event Submission

DiGRA 2014 understands that no call can accommodate all types of research. We believe that there is excellent research and scholarship happening in the spaces between the formats we traditionally offer. We are happy to consider submissions not listed above, for example tutorials, performances, or an experimental session. Many participants in the past have asked, “why don’t they do a blank” at DiGRA. This is an invitation to fill in the blank.

One of the conference events from DiGRA 2014 serves as a nice example for why this matters. “The Playful is Political: A Fishbowl Conversation on Identity and Diversity in Game Culture” was a session organized and hosted by Shira Chess and Adrienne Shaw. It consisted of a facilitated discussion where seats were arranged in two concentric circles. In a fishbowl discussion, the people sitting in the inner circle of seats (the fishbowl) have a discussion while those on the outside listen and observe. During the session people on the outside can change positions with those in the center and thus join in the discussion. As a participant, your location in the room (outer/inner circle) signals your role in the discussion (listener/discussant). As a technique, fishbowl discussions are easier for moderators to manage. The topic of discussion in this session was, as the title suggests, identity and diversity in game culture (including game academia).

After the conference was over, this session came to the (mostly angry) attention of the online movement GamerGate. I think this was in due in part because of the format of the session: it was a space for discussion that afforded note-taking and, more importantly, a desire amongst attendees to share notes after the session. This led to it being a more “discoverable” event than what it might have been had it been say, a paper presentation or a panel.

This is probably the first time that DiGRA, as an organization, has drawn significant attention from the general public. It is probably also the first time that significant portions of the collective research output of the games research community (in this case, the proceedings and contents of DiGRA’s digital library) have come under question, scrutiny, and comment. While it is unclear what, if any, the results of “Operation Digging DiGRA[1]” will be, the repercussions of that attention, both positive and negative, and both collectively and individually, will probably be felt and discussed for years. As Antonsen and colleagues noted, this experience is “a striking example of an interest group (gamers) engaging with academic work about their lives (game studies) to question the role of this research” (Antonsen, Ask, and Karlstrøm 2014).

While this unexpected attention to our academic community is leading to more scholarly work (e.g. Heron, Belford, and Goker 2014; Chess and Shaw 2015; Flöck et al. 2015; Kendall-Morwick 2015; Massanari 2015; Todd 2015; Richard 2015), it also provides us an excuse to reflect on how we interact and communicate our work with potential audiences who are not ourselves. These additional audiences might include game industry professionals, game fanatics, players of games in general, but could also be perceived more broadly, and widely. What happens when an audience, one you might not even have been addressing, speaks back? Bogost speaks of the challenges of being a “public intellectual” (Bogost 2010), but being an intellectual addressable and reachable by the public, perhaps a “public” you have no intention of engaging with, is a different matter entirely. Apologies to Nietzsche, but nowadays you need not stare into the abyss for it to stare back at you. What role, if any, should our conferences play in this?

WHAT HAPPENS AFTER THE CONFERENCE

Once the conference is over, it’s not yet time to rest. First of all, it’s necessary to settle all the accounts and see how things ended. For DiGRA 2014, it was good news, thanks in part to some last-minute sponsorship support, the conference did not incur a loss. In fact, we were able to spend more money (at the last minute) providing additional (and better) catering options to the attendees. While I don’t really know if these numbers are “normal” for DiGRA conferences, I thought I’d share them anyways:

- 49% of the registered participants were students.
- 70% of the expenses were venue-related. This includes AV, catering, and also the tram tickets provided on the last day of the conference.
- 20% of the venue expenses were for AV, pretty much everything else was food. From later experience (chairing

FDG2015), AV is the “line item” with the most variance across venues.

- Only 10% of the expenses were related to our keynote speakers. This is probably lower than usual because we were lucky to have a few local speakers who didn’t require airfare.
- We only spent 6% of the money on the registration materials: conference bag, USB stick, water bottle, etc.
- Income from registration was only 73% of our budget. Getting good sponsors can really make a difference.

As a final note,

The Conference Chair is Responsible for the Special Issue of ToDiGRA

While this last point is somewhat self-evident given that you’re reading this, I think that its implications are also worth mentioning. Conference websites come and go, and conference proceedings are de-emphasized in favor of the individual papers that were presented. I imagine that most people don’t remember who chaired a particular conference if it happened more than a few years ago. So, being in charge of a special issue of a journal such as the *Transactions of the Digital Games Research* (ToDiGRA) provides me with a chance to have “a last word” as it were: I can provide a record that will be archived and preserved. In doing so I can reflect upon the conference as a whole and perhaps argue for how I would like for it to be remembered and referred to.

I can do that via editorials such as this one or through invited pieces such as “We Are All Fishes Now: DiGRA, Feminism, and GamerGate” by Shira Chess and Adrienne Shaw.

So, how would I like for people to remember DiGRA 2014? DiGRA 2014 wasn’t a large conference, it was rather small by DiGRA

standards. Perhaps because it was in a somewhat secluded location, up in the Wasatch mountains, it was unusually cozy, friendly, and also productive. Great talks, great research, and great ideas and new collaborations for future work.

Thanks for reading.

ACKNOWLEDGMENTS

I'd like to thank everyone who participated and helped in making DiGRA 2014 a success. Additionally, I feel that I owe a debt of gratitude to all those who have made earlier DiGRA conferences a success, a lot of what I have written about above comes from my experiences at these conferences. Thanks!

END NOTES

[1] “Operation Digging DiGRA” is/was a collective effort by the GamerGate members to download, distribute, read, and “peer-review” the entirety of the contents of DiGRA’s digital library.

BIBLIOGRAPHY

Antonsen, Marie, Kristine Ask, and Henrik Karlstrøm. 2014. “The Many Faces of Engagement.” *Nordic Journal of Science and Technology Studies* 2 (2): 3–4.

Bogost, Ian. 2010. “We Think in Public.” In *Time Will Tell, but Epistemology Won't*. http://bogost.com/writing/we_think_in_public_1/.

Chess, Shira, and Adrienne Shaw. 2015. “A Conspiracy of Fishes, Or, How We Learned to Stop Worrying About #GamerGate and Embrace Hegemonic Masculinity.” *Journal of Broadcasting & Electronic Media* 59 (1): 208–20. <http://dx.doi.org/10.1080/08838151.2014.999917>.

Flöck, Fabian, David Laniado, Felix Stadhaus, and Maribel Acosta.

2015. “Towards Better Visual Tools for Exploring Wikipedia Article Development–The Use Case of “Gamergate Controversy.” In *Proceedings of the Ninth International AAAI Conference on Web and Social Media*.

Heron, Michael James, Pauline Belford, and Ayse Goker. 2014. “Sexism in the Circuitry: Female Participation in Male-Dominated Popular Computer Culture.” *ACM SIGCAS Computers and Society* 44 (4): 18–29. <http://dl.acm.org/citation.cfm?id=2695582>.

Kendall-Morwick, Joseph. 2015. “The Need for Voices in CS to Address the #GamerGate Controversy.” In *Proceedings of the 46th ACM Technical Symposium on Computer Science Education*, 514–514. Kansas City, Missouri: ACM. <http://dl.acm.org/citation.cfm?id=2691888>.

Massanari, Adrienne. 2015. “#Gamergate and The Fapping: How Reddit’s Algorithm, Governance, and Culture Support Toxic Technocultures.” *New Media & Society*, no. October 9. <http://nms.sagepub.com/content/early/2015/10/07/1461444815608807.abstract>.

Richard, Gabriela T. 2015. “Intersecting Vulnerabilities in Game Culture: The Effects of Inequities and Stereotype Threat on Player Confidence, Identification and Persistence Across Gender and Race.” In *Proceedings of DiGRA 2015: Diversity of Play: Games – Cultures – Identities*. Lüneburg, Germany: DiGRA. <http://www.researchgate.net/publication/275771792>.

Todd, Cherie. 2015. “COMMENTARY: GamerGate and Resistance to the Diversification of Gaming Culture.” *Women’s Studies Journal* 29 (1): 64.

We Are All Fishes Now

DiGRA, Feminism, and GamerGate
Shira Chess & Adrienne Shaw

We are all fishes now

It is likely unnecessary, and in such a short space impossible to offer a recap of GamerGate. Most of you already know about the string of events and topics associated with this hashtag: conspiracy theories, the harassment of women, the attacks on feminism, the defense of gamer identity, “consumer revolts,” and the never-ending insistence that this is about “ethics in game journalism.” For those of you who need to catch up, we have written elsewhere on the topic (Chess and Shaw 2015). There are also many recaps of it in the news from Fall 2014 (Dewey 2014; Ryan 2014; Cross 2014) and many other researchers are working on ways to contextualize and understand this topic. We would be very surprised if there were not many GamerGate panels at DiGRA 2015.

Although it was not central to GamerGate’s machinations, our Fishbowl (an event we collaborated on at the 2014 conference) pushed DiGRA into the periphery of GamerGate’s vision. As such, after we wrote on the conspiracy theories around academia that came out following links made via the Fishbowl (Chess and Shaw 2015), an interesting point was posed to us. Given the negative backlash our Fishbowl seemed to have wrought for DiGRA members and the organization writ large, would it all have been better if the reviewers and conference planners had just rejected our submission? After all, it has caused a great deal of grief to many academics that were not primed for this fight. The Fishbowl was quite literally called the “smoking gun” that implicated DiGRA in the supposed feminist

or Social Justice Warrior conspiracy to “dismantle hegemonic masculinity” (whatever that means). DiGRA members whose research is funded by DARPA and other U.S. federal government organizations fueled accusations that all games researchers were somehow using games for feminist behavioral control experiments (whether their actual research was feminist or not). DiGRA itself was accused of conducting such research directly, using games to push a social justice agenda, rather than merely being a professional organization where some game scholars presented their work on occasion. Some of the more stalwart GamerGaters were eager to hunt down the organization’s tax records, while others sought to engage DiGRA in a dialog hoping to ensure that future games research had only gamers’ best interests at heart (i.e. finding out what makes games fun; sans critical research). Others initiated “Operation Digging DiGRA” –getting people to read and summarize articles to find material that that might be objectionable to them. Several DiGRA members who were not at the Fishbowl or present at the conference and even game scholars who are no longer official members of DiGRA, but might have once presented at the conference (and thus their work was in the digital library), became the targets of harassment for the seemingly unforgivable offense of writing about sexuality, gender, race, or other categories of difference and video games. DiGRA as an organization and feminist games scholars around the world were suddenly mired in a surprising and unnerving kind of infamy that they were not prepared for.

Given all that has happened, we’ve been asked and occasionally ask ourselves, should we have even done the Fishbowl? Was it worth the toll this has taken on us, our colleagues and our friends? Although everyone who is harassed is told to simply ignore it, though we have our internal support systems, avoiding vitriol is as exhausting as reacting to it. For feminist game scholars in particular, we know many people have had to make the active choice of continue (or start in the case of some graduate students) to do their work in the face of potential future harassment. GamerGate has had a chilling effect on our online discussions, and it has raised the stakes of doing this kind of research. If we imagine for a moment that without the Fishbowl

DiGRA would have never been a GamerGate target, which may be giving our little event more credit than it deserves, was it worth it? If we knew what was going to happen, would we still have hit send on that submission?

Although occasionally we throw our hands up in frustration as our Twitter mentions become crowded with anger (about what, it isn't always clear) because of a new accusation, a new video, a new "finding" from GamerGater "research", it is hard to say we regret the event. Certainly on the day we regretted how "off topic" it became; how mired in the inside baseball of academia the discussion regularly found itself, we regret that the notes were taken in such a way that they were mistaken for a transcript. But do we regret the event or that the notes were (for a time anyway) publicly available? We do not, for reasons we describe below. Our Fishbowl at DiGRA 2014 ("The Playful is Political") ended up being both important and necessary – not despite the ramifications but *because of* those very ramifications.

For years now, many feminist scholars have debated and analyzed tensions in the video game industry, in regards to diversity. Early work in this field gave nod to the complexities of getting younger girls more involved in gaming (Cassell and Jenkins 1998; Laurel 2001). Others debated over the hypersexualized bodies produced by hegemonic gaming culture (Schleiner 2001; Kennedy 2002). As time moved on, scholars began focusing on diversity topics more specifically on gamer culture, not only the positive aspects (Taylor 2006) but also sometimes some of the negative aspects (Consalvo 2011). Shaw (2012; 2015; 2013) has explored the ways marketing has constructed gamer identity in a way that shapes how people understand their relationship to gaming culture, leading even people who play a lot of games to not always call themselves "gamers." Jenson et al., (2011) argue that gaming innovations should bear in mind feminist ideologies, while Harvey & Fisher (2014) recently argued for post-feminist perspectives in game production. Still others have begun to pay attention to casual markets that are specifically geared towards women gamers (Chess 2012; Anable 2013). There are

dozens of important articles and topics in this area that space does not allow us to cover here.

Many of us feel strongly that this work is important. But, also, this research for a long time was largely siloed at academic conferences. Those of us discussing video games in terms of diversity and feminist theory are often relegated to our own tracks and panels. Indeed, at the DiGRA 2013 conference in Atlanta, a feminist track ran parallel within the larger conference. As the same people kept attending the same panels, we felt we were in an echo chamber. Feminist scholars expressed that they felt excluded from the larger conversation, and scholars that didn't specifically identify their research as "feminist" did not always feel welcomed in the feminist track. Although the topics of intersectionality and diversity were a primary theme of these panels, as has been true for a long time it is easy to assume (if not actually true) that in game studies, gender is the only category of difference we ever discuss. At academic conferences generally, is it not uncommon to hear someone say "I'd like to do intersectional research, but the studies I conduct are about white males so how can I?" Much work is left to be done if scholars do not yet realize that white male identity is an intersectional identity (all identities are).

At one point, the DiGRA 2013 conference had a plenary discussion about topics of diversity in gaming. The session was during a catered lunch and the majority of the audience talked over the speakers and ignored the larger conversation. The "Twitter-fall" projected on a screen at the front of the room displayed the frustration of those who felt those talking over the speakers were the very ones who needed to hear this discussion. If a truth bomb falls, but you are too busy asking someone to pass the ice tea pitcher, did any preconceptions ever really get exploded?

As the next DiGRA deadline rolled around, we wanted to organize something that could broaden the conversations about diversity in games and who was included. It seemed that discussing diversity was just as difficult in an academic setting as it was in the video game industry. This is neither surprising nor new – but we felt that DiGRA

as an organization could do better. Our president is a prominent feminist games researcher for goodness sake! If DiGRA can't talk centrally about questions of difference and diversity, what hope is there for other academic organizations or the mainstream games industry?

When the two of us first began our conversations about the Fishbowl, we discussed our mutual frustrations. We began contacting scholars that dealt with issues of diversity, intersectionality, and feminism to consider a new approach for the 2014 conference. We wanted to talk about the intersections of studying feminism, gender, sexuality, race, ethnicity and social class in gaming. Yet, we were troubled by the possibility that in creating a series of panels, we would just reinforce the problems of previous years. For example, it would highlight the same speakers who always tended to be highlighted, and while we recognize their importance we know that there are others doing games research around these questions and we wanted to include new voices as well.

We felt that presenting more of this research didn't really get at the heart of the problem. What we needed was an open conversation about the stakes of this research and the barriers to future work. As a solution, we opted for the Fishbowl format. The Fishbowl is one that does not privilege a single voice of authority, but rather, allows for a larger group conversation with those in the room. The format, traditionally, has everyone seated in a large circle with five chairs in the center. Participants sit in four of the chairs and one chair is left empty. If a person moves into the empty chair to speak, someone else leaves the circle, so that only four chairs are occupied at once. This format, we felt, might allow for a more open conversation about academic and games industry approaches to difference. In the spirit of digital humanities conferences we also created a public GoogleDoc where people around the Fishbowl could take collective notes on the discussion. It was meant to be a living document, allowing people who were not at the conference to add their thoughts as well (again, because our central goal was opening up this conversation).

We titled the event “The Playful is Political” with a bit of double-voicedness – we knew that feminist scholars would recognize the phrase (a play on the famous Second Wave Feminist slogan “The personal is political”) but we hoped that it would also not alienate newcomers into the conversation. We wanted a conference event that would draw a broader group of attendees, and felt strongly that it was time for outreach and new voices. In our most unrefined explanation of what we wanted of this event we said: “A sort of looking backwards and forwards, open discussion on what feminist game studies has done and what we need to be sensitive to as we move forward (i.e. really discussing intersectionality).” Our Fishbowl ended up being less about “feminism” exactly, and more about identity and representation in gaming in general. We were pleasantly surprised when the room for our Fishbowl was packed. Not everyone spoke, which is not surprising, but we saw many new faces and many people came who did not necessarily do feminist games research. Success!

The outcome of the conversation was somewhat diffuse, though. As often happens with academic conversations of this nature, we got off-track and larger issues and critiques of academic structure, publishing, and conferences became the focus. Some people felt it was a useful exercise (it was even suggested that we turn the panel notes into a “manifesto”) but others were more critical that we did not “accomplish” much. Immediately after the Fishbowl, we were largely ambivalent. It happened and maybe some good would come of it.

As most of you know, something did “come of it”. We detail the specific process elsewhere (Chess and Shaw, 2015), but through Adrienne’s tweets GamerGate found a link to the Fishbowl notes and between those notes and some blog posts they had already found about the conference an unwieldy conspiracy theory was born. When GamerGate found and targeted our Fishbowl, initially it was only a small number of scholars who were aware of what was happening. Only a few specific academics were called out, primarily via YouTube and Twitter. Overtime though, DiGRA as a whole became a target of operations called things like “DiggingDiGRA” where

GamerGate was going to perform a “peer review” of everything in the DiGRA library. Anyone who had ever written anything that might be accused of being feminist, Marxist, or really anything less than “Science” became a target of GamerGater ire. Some of our colleagues have received more vicious forms of harassment and attacks than others, but it is not our place to tell those stories. Many, if not all of us, have become much more aware of the importance of two-step authentication and protecting personal information online than we had been before (and as a group, we were already pretty savvy).

If the goal of the Fishbowl was a greater awareness of identity and representation issues in games and gaming culture, then we were successful in our goals. While perhaps, these goals were not met in the original event, the far-reaching conversations that came out of our Fishbowl have helped to establish this topic as both tangible and important. Certainly, not all of DiGRA has stood behind the outcomes of the Fishbowl – some have either shown indifference or sided more clearly with GamerGate. Yet, others who had not previously had any stake in issues of representation in gaming have gained a greater understanding of the research and the stakes of that research. Though we do not need everyone to agree with our positions, we are pleased that a topic that has been so long meaningful to us is becoming increasingly discussed: in DiGRA, in academia at large, and in popular press. If anything, the results of Operation DiggingDiGRA show just how small a percentage of DiGRA research is focused on these issues and in turn how much is left to be done. Moreover, while the toxicity of the GamerGate movement itself is jarring and upsetting, it provides a very clear “proof of concept” of what we have all been writing about for so many years. If ever there was a time for us to pay attention to the themes of diversity in gaming, this is that moment.

We never got around to writing our manifesto. But perhaps this is for the best – manifestos are so often full of anger and ire, and often only speak to specific, insider audience. Had our notes document been understood for what it was (and not vandalized with penis and cock-sucking jokes as it was) perhaps GamerGaters who interrogated

it could have entered into the conversation; it could have been an actual living document of this ongoing discussion of the stakes of representation and diversity. Instead, of it being used as “evidence” it could have been used as an entry point into dialog. In the end though, we did achieve what we had initially set out for in our goals: a larger conversation.

This conversation has not always been done in ways that we personally may have wanted, but we have had productive dialogues with self-identified GamerGaters around these issues. We have seen this play out on Twitter, some better faith than others. Dialog is not about building consensus; it is about learning to take seriously what other people have to say. And for those who will never take our work seriously, who rage against the injustice of us being feminists who dare to do research that others (sometimes even people in the games industry/journalists) might read and be convinced by—well that is not a position unique to GamerGate. Reviewers at journals often critique qualitative research in ways that unfairly compare it to quantitative research (though we do support the peer review process, when it works). Feminist research is rarely funded (at least in the U.S.), and questions of diversity and difference are always treated as peripheral and specialized in many of our home fields and even home departments. Feminist game scholars, really any scholars whose work that focuses upon diversity and difference (particularly if they are a member of a marginalized group), have always had to deal with more than our colleagues who deal with what are seen as more “neutral” topics. No one ever said this job was easy (except perhaps Scott Walker, (Herzog, 2015), and we hope that DiGRA members continue to treat these conversations as more central to the work we all do—whether you agree with what we have to say or not.

Anable, A. 2013. “Casual Games, Time Management, and the Work of Affect.” *Ada: A Journal of Gender, New Media, and Technology*. June 1. <http://adanewmedia.org/2013/06/issue2-anable/>.

Cassell, J, and H. Jenkins. 1998. “Chess for Girls? Feminism and Computer Games.” In *From Barbie to Mortal Kombat: Gender and*

Computer Games, edited by J. Cassell and H. Jenkins, pp. 2–45. Cambridge: MIT Press.

Chess, S. 2012. “Going with the Flo.” *Feminist Media Studies* 12 (1): 83–99. doi:10.1080/14680777.2011.558350.

Chess, S, and A. Shaw. 2015. “A Conspiracy of Fishes, or, How We Learned to Stop Worrying About GamerGate and Embrace Hegemonic Masculinity.” *Journal of Broadcasting & Electronic Media* 59 (1): 208–20.

Consalvo, M. 2011. “Confronting Toxic Gamer Culture; A Challenge for Feminist Game Studies Scholars.” *Ada: A Journal of Gender and New Media Technology* 1 (1). <http://adanewmedia.org/2012/11/issue1-consalvo/>.

Cross, K. 2014. “Empire of Dirt: How GamerGate’s Misogynistic Policing of ‘gamer Identity’ Degrades the Whole Gaming Community.” *Feministing*. October 23. <http://feministing.com/2014/10/23/empire-of-dirt-how-gamergates-misogynistic-policing-of-gamer-identity-degrades-the-whole-gaming-community/>.

Dewey, C. 2014. “The Only Guide to Gamergate You Will Ever Need to Read.” *The Washington Post*, October 14. <http://www.washingtonpost.com/news/the-intersect/wp/2014/10/14/the-only-guide-to-gamergate-you-will-ever-need-to-read/>.

Harvey, A, and Stephanie Fisher. 2014. “Everyone Can Make Games! The Post-Feminist Context of Women in Digital Game Production.” *Feminist Media Studies*. doi:10.1080/14680777.2014.958867.

Herzog, Karen. (2015, January 29). “Educators frustrated by Walker’s comments about faculty work.” *Milwaukee-Wisconsin Journal Sentinel*. <http://www.jsonline.com/news/education/uw-system-chief-ray-cross-blasts-scott-walkers-comments-on-faculty-workload-b99435400z1-290198121.html>

Jenson, J., S. Fisher, and S. de Castell. 2011. “Disrupting the Gender

Order: Leveling Up and Claiming Space in an After-School Video Game Club.” *International Journal of Gender, Science and Technology* 3 (1): 148–69.

Kennedy, H. W. 2002. “Lara Croft: Feminist Icon or Cyberbimbo? On the Limits of Textual Analysis.” *Game Studies: The International Journal of Computer Games Research* 2 (2). <http://www.gamestudies.org/0202/kennedy/>.

Laurel, B. 2001. *Utopian Entrepreneur*. Cambridge, MA: MIT Press.

Ryan, M. 2014. “The Threats Against Anita Sarkeesian Expose The Darkest Aspects Of Online Misogyny.” *The Huffington Post*. October 15. http://www.huffingtonpost.com/maureen-ryan/anita-sarkeesian_b_5993082.html.

Schleiner, A. 2001. “Does Lara Croft Wear Fake Polygons? Gender and Gender-Role Subversion in Computer Adventure Games.” *Leonardo* 34 (3): 221–26. doi:10.1162/002409401750286976.

Shaw, A. 2012. “Do You Identify as a Gamer? Gender, Race, Sexuality, and Gamer Identity.” *New Media & Society* 14 (1): 28–44.

———. 2013. “On Not Becoming Gamers: Moving Beyond the Constructed Audience.” *Ada: A Journal of Gender, New Media, and Technology*. June 1. <http://adanewmedia.org/2013/06/issue2-shaw/>.

———. 2015. *Gaming at the Edge: Sexuality and Gender at the Margins of Gamer Culture*. Minneapolis: Univ Of Minnesota Press.

Taylor, T. L. 2006. *Play Between Worlds*. Cambridge, Mass.; London: MIT Press.

Exploring the Cause of Game (Derived) Arousal

What biometric accounts of player experience revealed

Gareth Schott & Raphaël Marczak

Introduction

The wider research project from which this paper's findings are drawn seeks to address what Moscovici (1998) would term an instance of 'the scandal of social thought.' This is a phrase he uses to describe humans tendency for accepting non-logical and non-rational thinking. According to Moscovici, it is this kind of thinking has led to "illusionary correlations which [even] objective facts are incapable of correcting" (p. 210). The enduring and habitual belief under consideration here is, of course, the popular notion that digital games constitute injurious and harmful content involving players in actions that lead to a transmutation from games to the real world. This proposal or belief has given 'effects research' purpose, stimulated public concerns, and has triggered the intervention of regulation (as a legal issue in some parts of the globe). The treatment of games *as* violence is a position that game studies has intentionally, and for good reason (see Schott et al., 2013b), avoided since its inception. Yet, the implications of our disciplines' seeming disinterest is that it leaves classification systems in a position where they are still required to protect against the possibility of the putative effects of games. This, in turn, further reinforces the beliefs that first necessitated caution. While this represents a 'well-worn' debate, and while the notion of games *as* violent media no longer troubles the creators and players of games with the same vigor that it did over a decade ago, it does nevertheless remain an area of debate that our discipline has much to offer. We propose that there is benefit to be gained from re-examining the value of some of our more familiar deliberations, for

example, as to whether games primarily constitute ludic space and time generators (Aarseth, 2013) that are experienced as, and defined by, their operational systems, or whether they represent complex narrative forms that seek to persuade players that they are indexical (drawn from, related to real life).

By reflecting on scholarly tensions that have divided game studies since its formative years (e.g. the ailing yet still animate ludology vs. narratology debate), disciplinary-centric contests have failed to create an impression in the ‘effect debate,’ or give the more formal constituents of games a greater role within regulation judgments. Game studies has missed an opportunity to highlight how players might be pitting themselves against the particular logics of game systems in order to stimulate recognition that a non-pejorative or defensible form of ‘violence’ is in operation within games. Our research has explored the nature of gamic realism for *the player* and suggests that there is an argument to be made that player experiences entail a phenomenological shift away from the affect and inferences connected to mimetic representation and visual verisimilitude that constitutes the game’s façade, and closer to the underlying logics on which games function (Marczak et al., 2012; Vught et al., 2012, Schott et al., 2013). That is, the experience of games is recognized as an activity of conscious engagement with a rule system. This leads us to seek acknowledgment for the ‘entrancement’ of non-fictional content and activities, that also serve to challenge and redefine popular misconceptions of immersion (as a process of losing oneself in the text; see also Calleja, 2011).

This paper came about as a response to the theme and call for papers for the DiGRA 2014 international conference. The call encouraged submissions that revisited old themes from new perspectives, describing our interest in examining the *impression* left on players by games. Our research to-date has foregrounded game play as a configurative activity, more so than a more traditionally conceived interpretive activity (see Vught & Schott, 2012). However, this approach to understanding games left us in a position of not being able to assert with confidence what constitutes a violent experience

to be able to examine it empirically. Indeed, this point is connected to a larger problem relating to the woefully under-developed nature of the philosophy of violence (Bufacci, 2005). In the context of its relationship with games, violence has long been conceived as a universal and homogenous concept. For instance, within ‘effects research’ an operational definition of violence exists as “extreme forms of aggression, such as physical assault and murder” (Anderson & Bushman, 2001, p. 354). Such a definition of violence has been applied, without challenge, to the categorization of games as violent media. In order to begin to articulate the role violence plays in the relationship and interaction that occurs between games and players, we argue that it is necessary to acknowledge the dualistic ‘meaning’ produced by games that coexist and operate simultaneously.

Part of the challenge in discussing game violence comes from the manner in which game structure is contextualized and context is ‘gamified’. That is, a game’s formal elements are (partly) concealed within the expressive frame of a fictional world and narrative context. At the same time, encounters typically fraught with moral implications and consequence, should they occur in the real world, are abridged and simplified as one uncomplicated move in a series of game moves. During active play, the player’s attention is often divided between layers of representational and symbolic information, allowing the fictional world of the game space that holds the core diegetic experience of the game world to be reconfigured and overridden. For example, sitting on top of its ‘world of concern’ (Veale, 2012), are Heads Up Displays (HUD) and interface layers that convey information on a player’s status and gamic activity (e.g. health bar), thus possessing a declarative function that suggests actions, conveys their urgency, and/or forecast likely outcomes (e.g. screen death). As communication and feedback devices, the latter represent a powerful and commanding driver that guides player behavior and actions (Marczak et al., 2013). So while violent themes may cloak games, the way games function demands that they are understood as “penetrat[ing] elements of reality only to re-appropriate them and reproduce them in fragmentary modes assembled under new codes and laws” (Schott et al., 2013).

The nature of games does not permit us to assume that players automatically process violent content, at a representational level, or that the presence of violent themes produces an experience of violence, so that we might then simply assess its impact. Should we opt to approach the impact of violence by interrogating sections of game play, pre-selected for how they are deemed to correspond with more traditional notions of what constitutes violence, we are then working to the assumption that violence is a device that remains unaffected by its presence within a game system.

Capturing Experience

Through the implementation of a mixed methodological approach in the context of our research project, we have sought to capture the multi-dimensional nature of the experience of play by counterbalancing conscious reflections on game-play with bodily responses and summaries of within-game behavioral activity. The research design employed is located at an intersection between humanities, social sciences, and computer sciences and aims to report on the way games function as structural objects that determine and explain the nature of players' engagement. Over the course of our study, our research design is predicated on requiring individual players (participants) to play a single First Person Shooter or Action Adventure PC game over a period of five to six weeks. During these periods, we sought to engage with participants on the subject of their play experience on a number of levels. The first level of our analysis is focused on measurement of the game (audio visual output) together with an understanding of the player's role in its production. Player's engagement is variously represented by a novel form of game-play metrics (see Marczak et al., 2013) that maps players' within-game behaviors via the audio-visual feedback (screen and sound outputs) produced by the game, and assessing players' physiological responsiveness (indicating levels of arousal) to gaming events. Accounts of bodily responses are then translated into biometric storyboards (see Mirza-Babaei & McAllister, 2011) that visualize any commonality or co-occurrence of a player's biometric signals and game events. Extending beyond capturing and measuring

the activation of game texts during play, we also ask participants to engage in retrospective player commentaries in response to footage of their own game-play sessions. Finally, and completely beyond the confines of our research set up, participants also complete diary entries that capture their accounts of their game-play experiences away from the study.

While a mixed method approach provides different layers of information, it also serves to validate or contextualize what the different individual measures present us with. In addition to these advantages, this paper focuses on how our research design permitted the study to approach post-session analysis of player experience from different angles. For example, core to the development of our method for gathering feedback-based game metrics (see Marczak et al., 2013) was 1) a desire to abstract and summarize player experience using a technique that did not require researchers to view and manually code hours of game footage in real time, and 2) provide a method for gathering metrics that did not require access to game source code. When confronted with hours of captured game play footage generated with a commercially available off-the-shelf game title we get a player's distinct approach or playing style, determined by his/her individual differences in learning style, comprehension, and perception, to name but a few variables. The task of understanding player experience in the context of a broader sample of participants, therefore, constitutes a highly complex task. In the first instance, the application of feedback-based game-metrics to footage captured of game play sessions is designed to allow us to *segment* a game session into sections of play with defined meaning breaks, creating manageable portions of game-play activity in which player behavior is assessed. As outlined below in more detail, segmentation of play works with the structure of the game, but does not constitute an assumption as to what constitutes the most salient qualities of a game experience within that structure. One method employed in the examination of segments of game play is how it can be guided by a player's physiological response to the game. Thus, biometric measures permitted the player to signal which aspects of the game play experience we might examine as salient aspects of the game play

experience. The question then turns to what those events represent and whether they shed any light on debates that fail to examine violence for the manner in which it is re-purposed by games.

Segmentation of Game Play

Performance

Before discussing how the use of biometric data led to the consideration of an alternative set of activities that hold significance for players, it is first necessary to briefly outline the filtering process that employed GSR in conjunction with game-metrics to reveal a number of associations. The process under consideration here is segmentation of game-play performance. Segmentation is employed in the context of our work as a means of determining the homogeneity of sections of play divided by meaning breaks within the play experience (e.g. at its simplest level new missions, levels, information or plot updates). Based on Reynar's (1998) foundational work in this area, we employ his definition of segmentation as "the process of dividing lengthy documents in topically coherent sections." It is necessary to acknowledge that the concept of gameplay segmentation is not new to game studies, as it has already formed a key component of the Game Ontology Project (Zagal *et al.*, 2008). However, a key difference between the way Zagal *et al.* (2008) employ the term and how it has been employed in the context of our study is based on how we attempt to incorporate 'performance' into the logic of a game segmentation. Performance is a critical concept for us as it emphasizes the unfolding nature and relevance of player input, highlighting the role of the player as something more than just a necessary component to activate the game system (Aarseth, 2007). While Zagal *et al.* are clear to define the role of 'segmentation' as an exploration of the structure of gameplay that supports the analysis of the role of 'design elements,' we claim to segment based on how players engage with the game structure and the possibilities offered by it.

Zagal *et al.* (2008) opt to segment 'gameplay' on the basis of their

temporal, spatial, and challenge characteristics. Yet, in illustrating their approach, they apply their framework to vintage arcade games that foreground the rule system by virtue of their simplicity. This inevitably leads them to concede that contemporary games are likely to include “multiple type[s] of segmentation, that are interrelated, or even co-occur,” with novel game design also likely to require further ways of segmenting gameplay that may in turn call for a re-examination of any existing segmentation principles. In this way, Zagal *et al.* acknowledge how such processes are required to evolve, or demand a more open-ended approach. By incorporating player performance into our segmentation process we aim to achieve this, in doing so, by utilizing structure to achieve a segmentation that isolates relevant player experience. Meaning breaks are defined by the detection of various elements that carry information on structural properties such as changes in scene (e.g. shift to cut-scene), participant orientation (e.g. perceptual shifts, for instance from 3rd person perspective to bullet cam in *Max Payne 3*), or chronology (e.g. screen death) (Grimes, 1976). On the one hand, we identify a need to understand and characterize the structure of a game as a multimedia document (segmentation), while on the other, there is also a need to acknowledge and understand what comprises the content (indexing) or conditions of play. We therefore delineate further in order to incorporate ‘indexing’ as a process that determines where, in the structure of the system, the player is active (e.g. in-game verses menus), the nature of the player’s involvement and the degree of interactivity (e.g. fully, semi or non-interactive). When applied to gameplay, segmentation is therefore the determination of the boundaries (time stamps) of a coherent section of play that is comprised of a set of indexical properties. For example, the beginning and end of a cut-scene can often represent a significant plot point and change in a game (segment), but also can denote a distinction between ludic and narrative involvement and degree of interactivity of the player (index).

Segmentation Layers

In order to reach more fine-grained aspects of a play experience, it

has been useful to make the segmentation process a multi-layered approach. The layers, listed below, are employed in two different ways. The first is relating to the *process* of segmentation in which audio-visual footage of a game play-session is processed or ‘deconstructed’. And the second is relating to aspects of player experience that are ‘reconstructed’ using the layers to discern the meaning of a section of game play. The five layers proposed are:

- Game System
- Game World
- Spatial-Temporal
- Degree of Freedom
- Interaction

Each gameplay session produces an audio-video file of game play footage that is then analyzed, which makes the game metric and segmentation approach a post-processing method. This differs from more typical gameplay metric processes that exploit the game-source code, directly logging and saving, in real-time, different metrics — or sending them (in the case of telemetry) for further processing. The first step in our process is to acknowledge and treat the game system as a whole. That is, the initiation of game-play, as the diegetic experience of playing in a fiction world, only occurs once players move from splash screens and reach the higher order ‘main menu’ where they are able to activate play and enter to the game world. Only when play is initiated does the player move from the *game system* layer to the *game world* layer, the 3D space in which the game is situated and play is realized. From that point onward, play in *Battlefield 3*, for instance, is either broken or paused by the player, exiting play through higher order menus. The game world layer contains what we term ‘instances’ of game play (that permit segmentation). During audio-visual analysis of such ‘instances’, the player is present only as the entity behind, and responsible for generating and triggering the game footage under examination. The first key task in this process is to distinguish between in/out game and active/inactive and what this entails in terms of audio-visual design

coherence between two consecutive frames. After this, we begin to distinguish the *spatial-temporal* layer nested within the game world layer as we identify pausing or detachments from the game world by the player, or the results of the terrain traversed or activities completed by the player triggering cut-scenes or progression to new missions via a loading screen. These elements constitute identifiable nodes that map the progress and journey of the player and also the timing of when players experience core events in the game (useful for cross-player comparisons). Related to player progression through a game is the *degrees of freedom* and *interactivity* layers that constitute the manner in which the logic and rule system of the game is conveyed to the player and the degree to which the player is required to engage with the information provided by the game, or is permitted to ignore cues provided by the system.

To provide a simple example of how this might work in a game like *Battlefield 3*, and also to work back through the layers in the opposite direction, the game contains Quick Time Events (QTEs) that force the player to complete a series of rote-based actions (e.g. press E, left click mouse, then right click mouse, etc.). These prompts from the system are not presented to the player in a diegetic form, but remain procedural, only really acknowledging the nature of player input. In the context of QTEs, the player temporarily loses all other agency possibilities (i.e. they are unable to move freely or use strategy or weapons of choice). The degree of freedom becomes highly prescriptive, as the system (which is always in control of such conditions) is much more explicit in its treatment of the player as providing the necessary input to activate content and progress gameplay. Each interaction is preceded by an on-screen prompt (or video feedback stream from the perspective of our metric method), that indicates the action required (e.g. a blue icon matching the expected player input, E, mouse icon with left or right highlighted). Should the player follow this prompt with the correct input, the icon will then blink in blue in response as means of validating the player's action. Failure to follow the prompt will lead to red icon, indicating that a response was either incorrect or absent. The interactions defined by their degrees of freedom are built into the game system as a

form of mini-game (a task outside what one might expect in an FPS game environment) that is defined by success or failure, upon which progression is conditional and non-negotiable. As a marker of player progression, when a QTE occurs for the player is also indicative of space and time. That is, specific QTEs (like missions or levels) are conditional on players' ability to reach specific locations on a game map, but also indicative of how long it takes a player to reach these nodes within the game system (see Figure 3). A QTE will therefore be triggered only once a player has reached a pre-defined point in the game, and should the player succeed, the same QTE will not reappear in that version of the game again. To this degree, the time taken to activate different QTEs provide a marker of pace and rate of progression attributable to the levels of mastery possessed by the player, or nature and style of game-playing (e.g. exploratory and/or thorough verses action and/or goal oriented). Lastly, whilst an obvious statement, QTEs are part of the game world and therefore cannot appear should a player activates a pause or opts to manage the conditions of play through engaging in higher order menus. This provides a clear indicator for automatic processing of a game's audio-visual feedback as to when QTEs materialize for the player and the nature and degree of player activity that the player experiencing when QTEs occur.

GSR Steered Analysis

As described above, the segmentation process is designed to reduce footage of lengthy periods of game play activity into more manageable segments. This permits play to be located by where it occurs in terms of key structural components of the game, 'advancement' within/throughout the game, whilst indicating the nature of player activity, the level of demand being placed on players, and player response. While this method is capable of functioning unaided to map the actions and nature of the experience that a game offers, the aim of the wider-project responsible for producing this method addresses the nature of a player experience. Thus, in this context, the study not only sought to document play, but also what play means to the player. This has required us to revisit footage of

play with the player to ask them to reflect on different aspects of the game experience. Contributing to the process of engaging the player on their play is the physiological response of the players themselves. We have, therefore, used the biofeedback provided by participants during play to guide our selection of material for further discussion with players. Additionally, we have also sought to use biometric data to present a reading of the game 'as an experience,' one that generates arousal in players that we can then also compare with how well it corresponds to the different feedback-based metrics that are being put into action. That is, we ask if what we are collecting as game-metrics corresponds to a player's significant experiences within gameplay, thus improving the relevance of the metrics gathered as an indicator of player performance. It is during this process that biometric data also registered player arousal in aspect of the game that were not being registered by the feedback-based game metric system – indicating that there are aspects of play that may not be as readily, or logically identified as a source of excitement. It is these findings that might otherwise be disregarded that we seek to devote the remainder of this paper to discussing.

In our application of biometric data, we have utilized Galvanic Skin Response (GSR) as a measure of the conductivity of human skin. Typically GSR has been used in human-computer interaction (HCI) research settings to examine the degree of users' psycho-physiological investments, such as the level of mental effort or stress/anxiety incurred (Lin *et al.* 2005). Put more simply, physiological measurement attempts to explore the relationship between mind and body. A common application of physiological measures in HCI research is found in experimental studies that are seeking to determine the value of GSR as an objective measure of user experience. This means that GSR has been examined for its presence/value in assessments of pre-identified contexts with games (Lin *et al.*, 2005), network applications (Wilson & Sasse, 2000), and webpages (Ward & Marsden, 2003) where the experience is pre-selected for its expected response from the user. Our use of GSR is non-experimental and exploratory in nature in the sense that games such as *Battlefield 3* were played by participants at their own pace without interruption,

at one session per week (1-1.5 hrs. in duration) over a 6-week period. By contrast, Lin *et al.* (2005) asked players to complete three tasks in *Super Mario 64* (Nintendo) as quickly and correctly as possible with their performance compared to performance estimates of what a skilled player could achieve in those selected tasks. While the results of the above study revealed a strong relationship between subjective (stress rating scale) and objective measures (GSR), the conditions under which ‘users’ were assessed were pre-determined by experimental design and therefore, not necessarily a good representation of the player’s experience of play or wider conditions under which GSR is registered.

To begin working through the process of utilizing GSR, Figure 1 (below) presents raw data from two different data sources taken during play sessions of our pilot study with *Dead Island* (Author *et al.*, 2012). GSR and the player’s health values, as captured using feedback-based metrics from the on-screen health bar, are displayed separately. As a measure of avatar health, a health bar drop to zero represents avatar death while its disappearance denotes detachment from the game world instance. Health was examined as a useful metric, from an interactivity and player experience perspective, as sudden drops in health are often the result challenging moments in game play that can carry stress and the possibilities of losing achievements and an impediment to progress. We postulated that increases in GSR might co-occur with loss of health in parts of the game allowing us to account for a high proportion of the GSR readings produced by players. Significant challenges were faced in order to be able to link the information that was gathered and analyse them concurrently. Plotting GSR and health onto a single graph did not produce any meaningful interpretations as Figure 1 shows. The raw data sets of GSR and health are quite different to each other on a number of levels. Each measure contained a different level of precision thus requiring some form of standardization in order to enable meaningful analysis. GSR values change slowly and occur only after an eliciting event, resulting in non-simultaneous time stamps between GSR and game events, and, in doing so, inhibiting correlation analysis. Also, GSR and health status measures were

recorded at different levels of precision: health status values were recorded each second, while GSR values were recorded on average once per second, resulting in more GSR values than health status values.

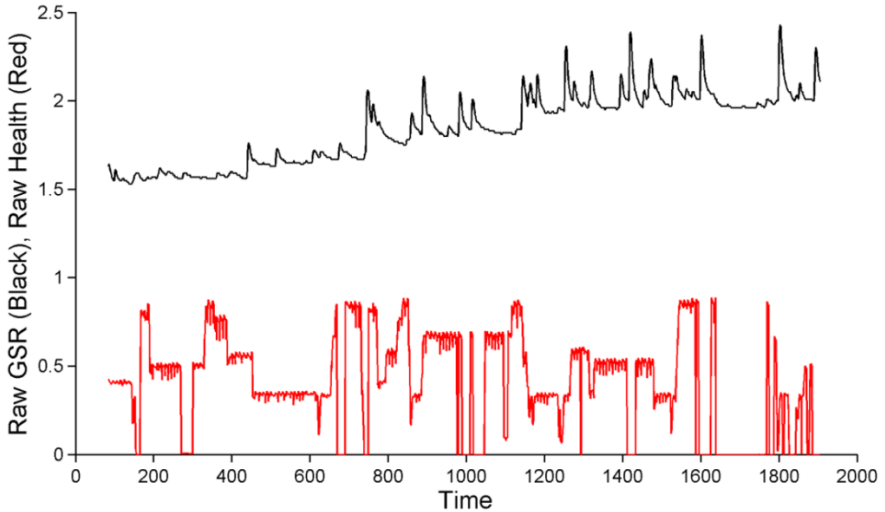


Figure 1. Raw GSR (black) and raw avatar health (red) for one game session (Dead Island).

While a number of moments of high physiological arousal (large GSR ‘spikes’) are observable, with GSR also generally increasing over time, plotting both GSR and health status reveals no meaningful information. Health status has no apparent visible consistencies, and has very large variations in value. Overall, there was too much variation in both data sets to make any statements or conclusions about either or to draw any links between them. Summarizing both data sets provided a solution. First, the differences between scores two seconds apart were calculated; thus, changes in the measure were calculated over short intervals (two seconds), and for each data point. Next, these difference values were summed over a slightly larger interval (six seconds), with the criteria that only positive GSR difference values, and negative health status difference values, were

included. Summarized data was then assigned a bin label: a time stamp relevant to the interval of which the summarized data was gathered. Bin labels always start at zero and increase in consistent intervals. The advantage of binning data was that each data set now contained identical time stamps with corresponding data that represented a particular moment in time. Thus, the data has been simplified and standardized while retaining meaningful information, thereby allowing for meaningful analyses.

Figure 2 displays summarised GSR and health status measures illustrating visible links that can now be observed between the two measures. It is interesting to note that the majority of large GSR spikes correspond closely in time to large health decreases:

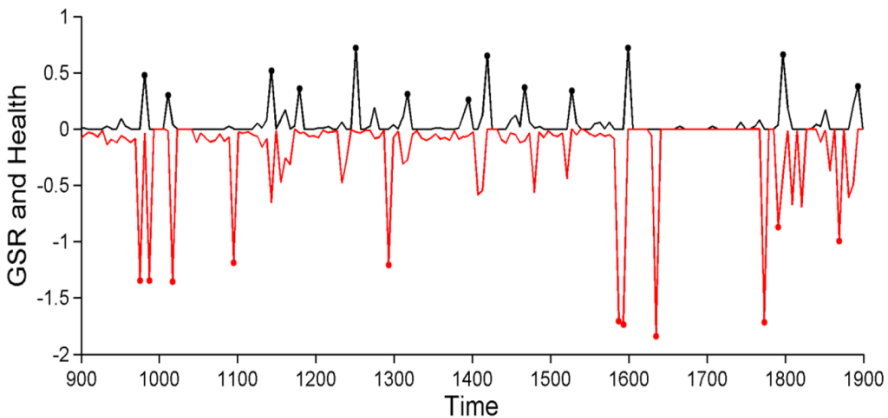


Figure 2. GSR (black) and avatar health status (red) of *Dead Island* are shown as summarized data. Filled circles within the GSR data set represent the largest 5% of summarized values, and filled circles within the avatar health data set represent 5% of the lowest values.

With the data summarized in this way, selecting points of analysis based on significant GSR values became viable. We then selected the largest 5% of summarised GSR values (indicated by a black filled circles, Figure 2) to direct further analysis. Because bin values represented time during game play, these GSR values could be used

to pinpoint particular moments in the game on which more data could be collected – game content and player commentary. Thus, further details and links between particular game events or content could be gathered, and even interpreted by the player themselves. The lowest 5% of health status values were also selected and highlighted (using filled circles) to determine a visual level of correspondence between the two measures.

Having established a visual association between GSR spikes and loss of health, we sought to examine a similar relationship with *Battlefield 3*. While *Dead Island* displays continuous health values on screen, *Battlefield 3* did not display health bar information and so required total health loss or screen death, signified by a ‘mission failed’ logo (see Marczak *et al.*, 2012), to be processed. While this procedure was equally successful (see Figure 3) it did not account for all the GSR spikes generated by players. This suggested that confining our study to the relationship between the measures drawn from the feedback-based game metric process alone was insufficient. As a post-processing method, the feedback-based metric approach is an ongoing approach thanks to the considerable amount of data that remains available for processing once game play has been captured. Therefore, in order to fully account for players experience and advance the feedback-based game metric approach, unaccounted GSR activity was also examined to assess what other metrics could be measured from the audio-visual feedback. Therefore, in cases where no observable correlation occurred between health metrics and GSR, storyboards were automatically generated for GSR spikes so that the activities of game-play could be examined. Each storyboard comprised of images taken over a 10 second period, centered on the bin relevant to the summarized GSR value. If a GSR spike was observed at 123 seconds (the summarized bin value) with no visibly associated health decrease, images were collected from 118 seconds to 128 seconds, extending 2 seconds either side of the bin (bins consisted of six seconds worth of data, i.e. 0 to 5.99 seconds). The generated storyboards were then manually analyzed to determine a) what was happening in the game and b) any commonality across the participants. Should any commonalities be identified, then it would be

possible to consider how such events could be captured automatically in the future via the feedback-based game metric method.

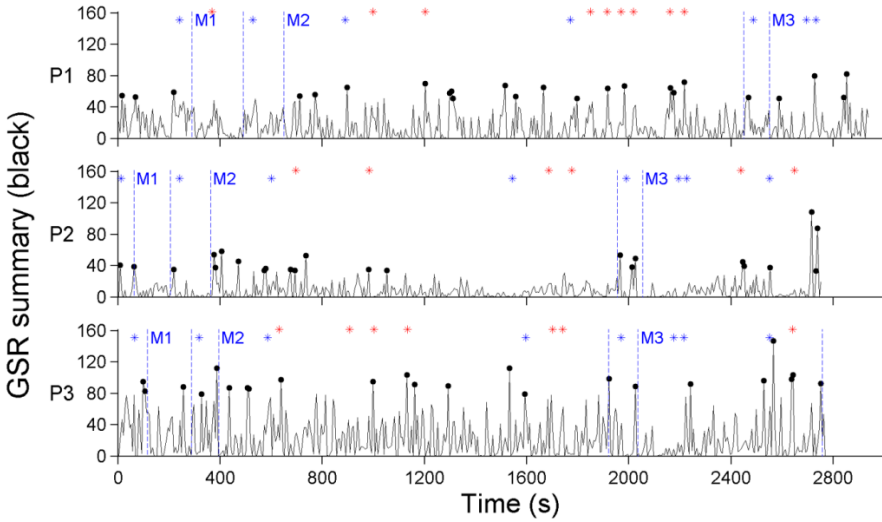


Figure 3: Summarised GSR for three participants.

Figure 3 (above) is annotated for cross comparison between participants, delineating the three different missions (M) that participants played through in a single session. Mission start and end times are indicated by vertical dashed lines. Avatar death is noted with a red asterisk, while a blue asterisk more generally denotes the occurrence of key moments in the game (that can be assessed in terms of ‘time and space’ comparisons). Typically a new mission is preceded by a cut-scene (*) explaining the asterisk before each mission start (-), otherwise within M2, the first asterisk indicates when a squadron member is shot (discussed below and seen in Figure 4) and the second a quick time event. The first and second asterisk within M3 also represent quick time events, while the last asterisk in the section denotes a scene in which the player is surprised by the appearance of an NPC that turns out to be a ‘friendly’.

The unresolved GSR-spikes for ten participants were examined by

manually coding the core elements in each scene depicted by the sequence of automatically generated screen shots. For each participant the ‘time stamp’ is noted, together with the presence or absence of variables such as injury (e.g. sustained to self or NPC squadron member), environmental conditions (e.g. day/night, qualities of the terrain, space, etc.), the nature of the player’s movement (e.g. stealth, running, in transit, etc.), combat, directives (e.g. “let’s go”, “follow me”). In total, each storyboard scene was examined for the presence or absence of 32 variables. Prior confirmation of the co-occurrence of death and GSR had a significant impact on what remained as unresolved GSR. For example, in order for the player to end a sequence of play with screen death, they are, by necessity, typically engaged in direct conflict with the enemy. Thus, co-occurrence of death and GSR accounted for the majority of player arousal associated with combat-scenarios, in which GSR spiked around the moment of failure. Equally significant, unresolved GSR rarely involved the player actively engaged in acts that come under the rubric of violence (i.e. shooting or fighting). The majority of enemy related scenarios associated with GSR spikes, were either anticipatory in nature or situations in which the player is under attack from the enemy. Such attacks were typically from a distance where the enemy was not easily visible or identifiable. Key GSR-triggered storyboards, taken from a single session with *Battlefield 3*, are outlined below for the way that they highlight significant moments in players’ game-play experiences.

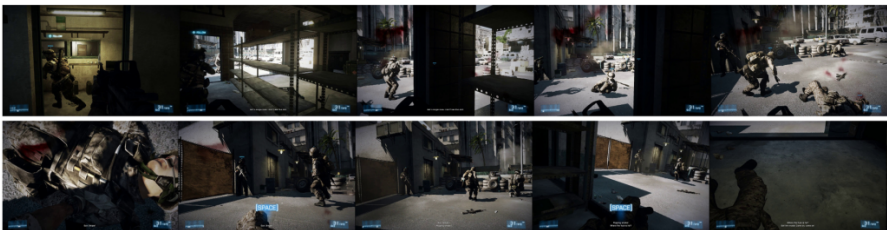


Figure 4: Automatically Generated Screen Shots of Events that occur with GSR Spike

Figure 4 illustrates a consistent and salient scene for participants, which is indicative of anticipation and suspense that punctures play and experience of *Battlefield 3*. The players playing this scene emerge with their battalion from a dark interior into a bright exterior. This action requires a quick visual adjustment and sudden exposure to an expansive outdoor urban area. The player is directed to “Follow”, requiring them to keep pace with NPCs ahead rather than approach the scene with any caution. At the same time a fellow marine declares “Not a single civie. I don’t like this shit”. The interior is also populated with metal shelving preventing the player from obtaining a clear and unobstructed view of what lies immediately ahead. As they emerge from the interior space the battalion quickly comes under fire and an NPC battalion member is shot requiring the player to drag the character back to the safety of cover. Such a scene does not portray enemies of old, that provide the player with opportunities to indulge in the slaying of waves of adversaries, placed in front of the player to mow down indiscriminately. Instead, the enemy remains aloof and invisible.

A similar scene (see Figure 5) that also proved to be prominent as a GSR-triggered moment in players’ experience saw players under fire on a building roof top. Again, the scene is characterized by the similar elements as Figure 4 as an unseen adversary has opened fire on the battalion, causing the player and NPCs to crouch and crawl around the roof top location. The key difference in this section of play is the pressure placed on the player to locate the enemy and return fire on the building from where the shots emanate. While this scene is actually identified (via the metric system) and coded as both a form of engagement that also typically involves player failure (screen death), it is noteworthy for the manner in which player actions are managed by the system and resolved in an action whose in-game consequences are far-removed from the player.



Figure 5: Automatically Generated Screen Shots of Events that Occur with GSR Spike

While such distinctions relating to the nature of play with *Battlefield 3*, via moments revealed by GSR activity, might not appear overtly momentous as a commentary on the experience of game-play, such examples nevertheless deserve to sit alongside judgments delivered by watchdogs as to what a game experience entails. Such examples serve to present game play experiences with greater breadth. They also further collapse the experience of play as violence, disclosing the role and forms that violence take in specific game contexts. Indeed, the dynamism of the game system is evident in both examples outlined above, presenting a clearer representation of the role of the player in such moments of play. Both examples show how the player had been asked to perform a particular task having been maneuvered into position by the conditions of the game and had their degree of freedom reduced and restricted. In such contexts the influence of rule system is unequivocal.

Additionally, other unaccounted for GSR-identified extracts of game-play contained many examples of otherwise trivial or negligible content that are unlikely to attract consideration in the context of classification, but offer a more balanced account of where excitement and investment resides for the individual experiencing play. To highlight but a few examples, Figure 6 depicts a scene in *Battlefield 3* in which the battalion is on the move, running and jumping across rooftops. In this section of game play, the battalion pause to craft a makeshift gangplank between two buildings, before leaping off roofs until they eventually reach ground level. Likewise, mission briefings, anticipatory moments in transit and loading screens for new levels

all generated responses that drew consideration away from the more obvious dimensions of the game.



Figure 6: Automatically Generated Screen Shots of Events that Occur with GSR Spike

Conclusion

While a paper of this nature would ordinarily seek to conclude by stating the value and performance of the methods presented, in this case 1) feedback-based game metrics and 2) the method of processing biometric data, the theme of DiGRA 2014 has given us an opportunity to shift our attention to aspects of the data that otherwise would clutter such an academic process. That is, while our study remains focused on seeking to establish a strong relationship between metrics and GSR in order to characterize a player's performance, the results of players' bio-feedback also suggests that the range of associations that can be taken from a game experience are much wider and more diverse than our processes currently account for. Furthermore, in allowing the player to guide our analysis of their game-play experience, via their GSR, it was possible to avoid simply asserting player responses to pre-determined sections of game play that have been identified for the content. Instead, examining unresolved GSR data required us to explain the relevance of sections of play that would not typically feature in deliberations as to the focal impact that a game will have on its player. A picture emerges of the value of intermittent or irregular moments, the significance of achievements and advancement (e.g. mission loading screens, mission briefings),

and the pressures and challenges that games present players as a rule system.

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BIBLIOGRAPHY

Aarseth, E. "I Fought the Law: Transgressive Play and the Implied Player," in Proceedings of Digital Game Research Association Conference: Situated Play (2007). Available at <http://www.digra.org/dl> (accessed Feb. 2014)

Aarseth, E., "Ludo-Narratives vs the Meta-Chronotope," DeFragging Game Studies: DiGRA 2013, Atlanta, Georgia, (2013).

Anderson, C.A. and Bushman, B.J., "effects of Violent Videogames on Aggressive Behavior, Aggressive Cognition, Aggressive Affect, Physiological Arousal, and Prosocial Behavior: A meta-analytic review of the scientific literature, in Psychological Science, vol. 12, no. 5, (Sept. 2001), pp. 353-359.

Bufacchi, V., "Two Concepts of Violence," in Political Studies Review, vol. 3, no. 2, (2005), pp. 193–204.

Calleja, G., In-Game: From immersion to incorporation, MIT Press: Cambridge, MA, (2011).

Grimes, J. E., The Thread of Discourse, Mouton: The Hague (1976).

Lin, T and Hu, W., "Do Physiological Data Relate to Traditional

Usability Indexes?” in Proceedings of OZCHI 2005, (2005), ACM Press.

Marczak, R., Vught, J., Schott, G. & Nacke, L. E. , “Feedback-Based Gameplay Metrics: Measuring Player Experience Via Automatic Visual Analysis,” Proceedings Of The 8th Australasian Conference On Interactive Entertainment: Playing The System. ACM Press, (2012).

Marczak, R., Schott, G., Hannah, P. & Rouas, J., “Feedback Based Gameplay Metrics,” Proceedings of Foundations of Digital Games, pp. 71-78, (2013).

Mirza Babaei, P. & McAllister, G., “Biometric Storyboards: Visualizing meaningful gameplay events,” in Proceedings of CHI 2011, (2011), ACM Press.

Moscovici, S. “The History of Actuality of Social Representations,” in U. Flick (ed.) The Psychology of the Social, Cambridge University Press: Cambridge, (1998), pp. 209-47.

Office of Film and Literature Classification, Public Perceptions of a Violent Videogame: X-Men Origins: Wolverine, OFLC: Wellington, (2009).

Reynar J.C., “Topic Segmentation: Algorithm and Applications,” PhD Thesis, University of Pennsylvania, (1998).

Schott, G., Marczak, R. & Mäyrä, F., “DeFragging Regulation: From putative effects to ‘researched’ accounts of player experience”, Defragging Game Studies: DiGRA 2013 Peer Reviewed Proceedings, (2013a).

Schott, G. Vught, J. & Marczak, R., “The ‘Dominant Effect’ of Games: Content vs. Medium,” Journal of Creative Technologies, Vol 1(3), (2013b). Available from <http://journal.colab.org.nz/article/25> (accessed Feb. 2014).

Smith, T., “Watch You Watching ‘There Will Be Blood,’” in K. Thompson & D. Bordwell (eds.) *Observations on Film Art*, (2011). Available at <http://www.davidbordwell.net> (accessed Feb. 2014)

Veale, K., “‘Interactive Cinema’ Is an Oxymoron, but May Not Always Be,” in *Game Studies*, vol. 12, no. 1, (Sept. 2012). Available at <http://gamestudies.org/1201/articles/veale> (accessed Feb. 2014)

Vught, J., Schott, G., Marczak, R., “Understanding Player Experience Finding a Usable Model for Game Classification,” *Proceedings Of The 8th Australasian Conference On Interactive Entertainment: Playing The System*, ACM Press (2012).

Ward, R.D. and Marsden, P.H., “Physiological Responses to Different WEB Page Designs,” in *International Journal of Human-Computer Studies*, vol. 59, no. 1, (2003), pp. 199-212.

Wilson, G.M. and Sasse, M.A., “Do Users Always Know What’s Good For Them? Utilizing physiological responses to assess media quality,” *Proceedings of HCI 2000: People and Computers XIV – Usability of Else!* Springer: Sunderland (2000), pp. 327-339.

Zagal, J. P., Fernandez-Vara, C. And Mateas, M, “Rounds, Levels, And Waves: The Early Evolution Of Gameplay Segmentation,” In *Games And Culture*, Vol. 3, No. 2, (2008). Pp. 175-198.

Reconciling Csikszentmihalyi's Broader Flow Theory

With Meaning and Value in Digital Games
John Hamon Salisbury & Penda Tomlinson

INTRODUCTION

The aim of this paper is to put forward an additional condition to the characteristics of 'Flow' (Csikszentmihalyi, 1975) that addresses the idea that the "meaningful experiences" Csikszentmihalyi is talking about rely on constructions of value drawn from our personal cultural context and not from some absolute set of invariant cultural values. Although this may be seen as broadly applicable to all discussions of 'Flow' type experiences the focus here is on Mihaly Csikszentmihalyi's discussion of his concept of optimal engagement known as 'Flow' (Csikszentmihalyi, 1975, 1979, 1990, 1996, and Kubey, R., & Csikszentmihalyi, M. 2002) as it relates to existing and future uses of 'Flow' in design and analysis of digital games.

Mihaly Csikszentmihalyi's concept of optimal engagement known as 'Flow' (Csikszentmihalyi, 1975; Csikszentmihalyi, 1990) is discussed in detail later in this paper, especially focusing on the key idea that there is a set of characteristics that are common to all 'Flow' experiences. The core concept is that 'Flow' describes a type of heightened engagement with an activity where the participant is so involved in the activity that there is no awareness spared for one's environment or even self-consciousness. Csikszentmihalyi describes the experience of Flow as:

"...a sense that one's skills are adequate to cope with the challenges

at hand, in a goal directed, rule-bound, action system that provides clear clues as to how well one is performing. Concentration is so intense that there is no attention left over to think about anything irrelevant, or to worry about problems. Self-consciousness disappears, and the sense of time becomes distorted. An activity that produces such experiences is so gratifying that people are willing to do it for its own sake, with little concern for what they will get out of it, even when it is difficult, or dangerous.” (Csikszentmihalyi, 1975, p. 71)

There is a substantial amount of examination and discussion of what constitutes ‘Flow’ in the two key works on the subject by Csikszentmihalyi (the 1975 book is approximately 230 pages and the 1990 book is approximately 320 pages). In Mihaly Csikszentmihalyi’s broader discussions of Flow across these works and his wider body of work he discusses instances of engagement and frequently characterises them as either passive and entropy inducing, and therefore not ‘Flow’, or meaningful growth promoting experiences -‘Flow’.

Entropy inducing -

“But this also depends on what activity provides Flow. Unfortunately, many people find the only challenges they can respond to are violence, gambling, random sex, or drugs. Some of these experiences can be enjoyable, but these episodes of Flow do not add up to a sense of satisfaction and happiness over time. Pleasure does not lead to creativity, but soon turns into addiction – the thrall of entropy.” (Csikszentmihalyi, 1996, pp. 123–124)

Growth promoting -

“In our studies, we found that every Flow activity, whether it involved competition, chance, or any other dimension of experience, had this in common: it provided a sense of discovery, a creative feeling of transporting the person into a new reality. It pushed the person to higher levels of performance, and led to previously undreamed of

states of consciousness. In short it transformed the self by making it more complex. In this growth of the self lies the key to flow activities.” (Csikszentmihalyi, 1996, p. 74)

It is the contention of this paper that this separation, into ‘good’ and ‘bad’ engagement, especially when applied to digital games is based entirely on implied cultural values of the authors (for example Kubey & Csikszentmihalyi) and needs to be more thoroughly examined and accounted for. The second half of this paper will put forward a detailed argument for an individualised and contextual definition of Flow as it pertains to the individual’s abstract cultural value. It is important to highlight that we are not referring to moral value or values specifically, rather we are referring to the construction of personalised perceived abstract value and the employment of that value in evaluating the worth of activities we could undertake. To help build this argument, the paper will address and attempt to integrate such concepts as Cultural Value (Bourdieu, 1986), and Habitus as well as a sense of culturally relative self-sense (Cooley, 1902) into a broader context definition of ‘Flow’ as individually meaningful positive engagement.

The authors feel this is important to address in digital games research because Flow is used in general videogame analysis and design discussions as an explanatory tool for player motivation in the face of challenges. This distinction between types of engagement is absent from the two types of discussion of ‘Flow’ in digital games. The first type of discussion of ‘Flow’ in digital games is to use ‘Flow’ as a model of how players might be motivated to find enjoyment with digital games (e.g. Baron 2012; Cowley et al. 2008; Sweetser and Wyeth 2005). The second type of discussion of ‘Flow’ in digital games is to use ‘Flow’ in examinations of designing appropriate challenges that avoid player boredom or frustration (Brathwaite & Schreiber, 2009; Fullerton, Swain, & Hoffman, 2008; Schell, 2008). In these cases, the discussion almost exclusively focuses on the description of ‘Flow’ presented as ‘the 9 characteristics of Flow’ and the diagram of the ‘Flow Channel’ between boredom and frustration. None of these works address the problem that Csikszentmihalyi has

consistently implied that digital games can only produce ‘bad’ engagement (entropy).

It seems wise at this point to raise Csikszentmihalyi’s exploration of play in contrast to Flow. In his essay ‘Some Paradoxes in the Definition of Play’ (1979) Csikszentmihalyi defines play as a subjective state where an individual has freely chosen to engage in an activity irrespective of or counter to the normative rules or conditions which might be in place to frame that activity in that individual’s reality. Thus, for Csikszentmihalyi, play and games are distinct. Play is the approach to an activity in which an individual intends to act in a way which is not wholly in compliance with the norms or rules of the context. Games however, are fixed sets or rules and agreed actions which may be approached playfully, but not necessarily. That said, games according to Csikszentmihalyi are codified realities which may allow for the safe (or in Csikszentmihalyi’s terms ‘emasculated’) bending of the rules outside of the ‘serious’ reality of daily life. So one may ‘play’ a game, conforming to all the rules, and thus would not have engaged in that reality ‘playfully’. A playful exploration of a reality and the earnest engagement in a game can both be potential sources of Flow, as could a routine activity in full conformance with one’s normative reality (such as work). Flow being a ‘process of involvement’ with any activity, given the presence of appropriate conditions.

This separation of playfulness from the act of participation in a game may point to the importance Csikszentmihalyi places on the individual’s expression of self-generated value (the autotelic component of ‘Flow’) and argues for a wider discussion of the idea of knowing subversion of cultural and personal values and the creation of personal realities, which is beyond the scope of this paper.

FLOW IN GAMES

Csikszentmihalyi describes the experience of Flow as:

“...a sense that one’s skills are adequate to cope with the challenges

at hand, in a goal directed, rule-bound, action system that provides clear clues as to how well one is performing. Concentration is so intense that there is no attention left over to think about anything irrelevant, or to worry about problems. Self-consciousness disappears, and the sense of time becomes distorted. An activity that produces such experiences is so gratifying that people are willing to do it for its own sake, with little concern for what they will get out of it, even when it is difficult, or dangerous.” (Beyond Boredom and Anxiety, 1975, p. 71)

This quote is a general statement of the position upon which Csikszentmihalyi builds the concept of Flow; a deep engagement with an activity in which the participant finds a profound sense of gratification and ultimately constructive personal meaning and enjoyment.

Breaking the concept down further in his subsequent work to *Beyond Boredom and Anxiety* Csikszentmihalyi provides sets of ‘conditions’ or features of Flow. One such breakdown is the following set of nine conditions found in *Creativity: flow and the psychology of discovery and invention* (Csikszentmihalyi, 1996):

1. There are clear goals every step of the way
2. There is immediate feedback to one’s actions
3. There is a balance between challenges and skills
4. Action and awareness are merged
5. Distractions are excluded from consciousness
6. There is no worry of failure
7. Self-consciousness disappears
8. The sense of time becomes distorted
9. The activity becomes autotelic

These conditions and quotes seem to sum up certain types of engagement with video games quite well. As such, and as noted in

preceding sections, the above conditions of Flow are often quoted by researchers and designers who are using the concept of Flow as a model of engagement and even enjoyment or pleasure found in playing video games. Point 3 is often a focus of attention, and variants of a diagram regularly employed by Csikszentmihalyi throughout his work, which shows that a challenge must not be too great (or else frustration would result) or too slight (yielding boredom), are regularly found in the literature. For example, Chen (2007) employs a modified sense of optimal challenge based on Flow, which calls for an approach to the design of any single-player game which will allow the player to dynamically select the difficulty of the challenge through their actions. Expert players performing identifiably expert actions make the game more difficult, while novice players who act in identifiably novice ways make the game easier.

Flow while playing video games

If we map these conditions onto an imagined experience of playing a game, we can see that there is indeed a very good apparent fit between Flow and video game engagement.

We might have been deep into a middle level of a favourite scrolling shoot-em-up where:

1. We knew that what we had to do was avoid or shoot an onslaught of enemies
2. We knew what weapons we had to use and how close the enemies were getting to destroying our ship
3. We were at the point where we could just think fast enough and respond fast enough to avoid the stream of bullets and enemies
4. We'd stopped thinking about what the controls were, and were just thinking in terms of move and shoot
5. Nothing outside the game mattered for a few minutes, the

birds singing outside, or that we might be a tad hungry or in need of the toilet.

6. This is the furthest we'd ever come through this bullet hell, we just need to stay focused to see the level boss who must be only a little bit further along the path set out by the game.

7. That we were an adult sat cross legged on the floor, holding a strange plastic device covered in buttons, gurning and grimacing in comedic ways at the television didn't enter our conscious mind even for an instant; we were our ship and the ship was us.

8. The dozen or so attempts to get past this one section seemed to have taken 5 minutes or so, but when we looked at the clock it took more like half an hour.

9. Why we were flying through space shooting baddies from another galaxy was because... well for the period when we were... because it was fun. There was no expectation of economic or social reward, it was pleasurable in its own right. It was pleasing because of, rather than in spite of, the time and energy we had invested in it.

It is this apparent match between the published conditions of Flow, and the subjective experience occasionally felt in playing which has apparently resulted in the use of Flow as a way of understanding engagement with games.

Flow as a design concept

Flow is one model of engagement with the challenge of a game proposed within design focussed literature (Brathwaite & Schreiber,

2009; Fullerton, Swain, & Hoffman, 2008; Schell, 2008), The first three conditions of Flow are more or less heuristics for the kind of experience which might then lead to the remaining six: There are clear goals every step of the way; there is immediate feedback to one's actions; and there is a balance between challenges and skills. These rules of thumb are regularly reproduced alongside Csikszentmihalyi's diagram showing how Flow requires the right level of challenge relative to a person's skill in an activity. As such the way Flow is often framed by the design literature is almost another way to consider a games 'balance' or 'difficulty level'. While these heuristics might be of some use to a designer seeking to tune how difficult their target audience is likely to feel their game is, it is our contention that such an understanding of Flow is incomplete. Indeed, Chen (2007) does not include the condition of autotelism in his reproduction of the conditions of Flow. A well-tuned challenge does not necessarily yield 'enjoyment' in the sense Csikszentmihalyi employs the term. A player might find a game to be meaningful and satisfying, and thus feel enjoyable Flow, but they might equally find a game lacks value, is unsatisfying, and thus will not experience enjoyable Flow. Rather, they could conclude that they are wasting their time in an insidious, trivial, addictive pursuit. It is this issue of relating value to the apparent engagement with a game that this paper seeks to address.

Flow as an analytic tool

As the design literature attempts to employ Flow to aid the design process, others have taken Flow and attempted to employ it as a mode of analysing the quality of a game or the degree to which a player might find enjoyment with a game (e.g. Sweetser and Wyeth 2005). While these somewhat more academic approaches are more detailed, not merely assuming that Flow can simply be mapped onto videogames without further decomposition, as to what the conditions of Flow mean in the context of analysis and design of a specific game, we have found none which take Csikszentmihalyi's broader thesis into account. While Csikszentmihalyi has written extensively about the ability (or even need) for Flow to provide meaning to the lives

of those who experience it, it is a little surprising that the meanings or values of videogame play experiences are seldom explored in the context of Flow with respect to engagement with videogames. A little surprising, but not entirely so, as on the one hand Csikszentmihalyi claims that Flow can provide meaning, and gives examples of socially relative positive meaning encountered in Flow, but on the other insists that Flow must be free of external motivating influence if it is to provide enjoyment. However, a broad reading of Csikszentmihalyi's writing suggests that we cannot assume that instances of challenging play, which hold our attention for a time, should automatically be deemed 'enjoyable'.

Games may set up structures which may promote Flow, whether engaged in playfully or not. Flow and playfulness being independent phenomenological concepts expressing attitudes an individual has toward a reality (Kubey and Csikszentmihalyi). The issue raised by this current paper relates to an apparent confusion in the relationships between Flow, enjoyment, and pleasure. In that it seems that Csikszentmihalyi argues that Flow experiences will necessarily yield a satisfyingly meaningful outcome for individuals, and ultimately 'enjoyment' on the one hand, while admitting that some experiences, while fulfilling the stated conditions of Flow, do not yield satisfaction and enjoyment, but rather mere pleasure without meaning and potentially entropy or addiction.

Flow and cultural values

In *Creativity* (1996) where Csikszentmihalyi discusses how society has a role in teaching young people what activities they should be enjoying in order to grow personally and culturally:

"We are much too sophisticated in this day and age to have strong feelings in the matter. Yet we probably agree that we would feel better if our children learned to enjoy cooperation rather than violence; reading rather than stealing; chess rather than dice; hiking rather than watching television. In other words, no matter how relativistic

and tolerant we have become, we still have priorities.”
(Csikszentmihalyi, 1996, pp. 124–125)

This quote suggests that we cannot escape employing priority or value. Indeed, throughout his work Csikszentmihalyi seems to be arguing that while the principal experience of Flow is apparent in all societies, the activities through which one might achieve enjoyment or ‘good Flow’, rather than mere pleasure, or ‘bad Flow’, are personally realised and have a relationship with culture, if not society. That once a person is experiencing Flow, they will not question the experience, and will continue to engage as long as the appropriate conditions are in place, is not the subject of this discussion. Rather, it seems that Csikszentmihalyi is consistently arguing for an extra-Flow clause or a super condition of Flow which gives the individual a means of evaluating the meaning (and value) of a given Flow inducing activity.

To recap, it seems that for Csikszentmihalyi the difference between Flow as a positive, meaning producing, satisfyingly enjoyable experience and Flow as a negative, addictive, entropy inducing, merely pleasurable experience, is the individual’s sense of growth in normatively agreeable directions.

Flow and video games

Let us then consider a passage from a paper Csikszentmihalyi co-authored with Robert Kubey in 2002, about television:

“Although much less research has been done on video games and computer use, the same principles often apply [as they might to television]. The games offer escape and distraction; players quickly learn that they feel better when playing; and so a kind of reinforcement loop develops. The obvious difference from television, however, is the interactivity. Many video and computer games minutely increase in difficulty along with the increasing ability of the player. One can search for months to find another tennis or chess player of comparable ability, but programmed games can

immediately provide a near-perfect match of challenge to skill. They offer the psychic pleasure—what one of us (Csikszentmihalyi) has called “flow”—that accompanies increased mastery of most any human endeavour. On the other hand, prolonged activation of the orienting response can wear players out. Kids report feeling tired, dizzy and nauseated after long sessions.” (Kubey and Csikszentmihalyi, 2002)

The above quote, especially the value laden words used, such as ‘escape’ and ‘distraction’, suggest that despite the admission that games may offer ‘Flow’, in the case of ‘video games’ Kubey and Csikszentmihalyi feel that the Flow found in that specific context is undesirable.

Kubey and Csikszentmihalyi’s position on videogames seems to work counter to the principle of autotelism, explored in depth later in this paper, but that they pre-judge videogame play as potentially corrupting, devoid of meaning, or valueless, despite showing all the conditions of Flow presented above, raises the possibility that there are in fact at least two kinds of Flow. Good, meaningful, worthwhile, personal growth promoting Flow, and the bad, addictive, meaningless, waste of time kind. This is not an unusual observation. In data collected in interviews as part of a broad ranging study of players’ relationships with games (Salisbury 2013), a significant subset of players lamented the time they had spent playing games despite (in fact in a couple of cases reinforced by) having experienced apparently Flow like engagements when they did. Just as Kubey and Csikszentmihalyi ascribe their own values upon the children whom they have observed playing games, some players self-analyse the experience of deep engagement in games negatively. Reflecting on the loss of self and sense of time passing; reflecting on what they feel they have achieved; some players decide that playing games work against their efforts to achieve their own life goals. While they might find playing games to be ‘pleasurable’ on occasion, the deep engagement that they experienced was not ultimately enjoyable. It is this failure to find value in an otherwise absorbing and deeply

engaging activity which ultimately fails to yield a personal sense of greater value. We propose to call this kind of experience ‘bad Flow’.

A bad Flow activity provides clear localized goals; it provides feedback to the participant; the participant finds it suitably challenging; the participant doesn’t think about their actions as they perform them; the participant blanks out the distractions; they stop worrying about failure; they don’t think about who they are outside of the context of the activity; and time seems to pass more quickly. Ultimately, however the experience is judged by the individual to lack enjoyment or value, and does not generate a sense of long term, personal meaning.

Differentiating between good and bad Flow

In order to effectively differentiate between good Flow and bad Flow we need a means which any solution would avoid falling into the authoritarian trap of decreeing appropriate and inappropriate values and meaning. A trap which Csikszentmihalyi argues against but seems to fall into by suggesting that videogames are only able to deliver short-term pleasure and ultimately entropy.

The simplest way to differentiate between the two interpretations of a Flow experience would be to modify the stated conditions of Flow. A tenth condition of Flow might indicate that the individual must value the experience in some way. Employing a broad, axiological sense of ‘value’ which accounts for aesthetics, morals and ethics, and valences where the worth of a thing can be felt by an individual explicitly or implicitly.

That individuals make choices based on socio-culturally informed relative values can be illustrated by a simple example:

A young man who feels himself to be fit and has learned to value physical prowess; raised in the United States of America, he might easily be deeply engaged in playing and following American Football. He might even find Flow in running plays for his team or even following the tense parts of a game as a spectator. The sport adds

meaning and purpose to his life. He is aware of other sports, but they are not for him.

If we transpose our young man to having lived his life not too far away in Mexico he would not have grown up in a society where American Football is such a cultural force. Instead, his sporting passion is much more likely to be Association Football, which is much more popular in Mexico than gridiron.

In either case we can ask if the young man made a rational, deliberate choice to prefer one code of football over the other? He might be able to rationalize his choice once made, but we would contend that he would be enacting the culture of the society in which he was raised in order to come to these meanings. Why our young man would be fully committed to one particular sport over another is not well handled by the 'conditions of Flow' or the idea that either sport provides an optimal challenge for our young man when compared to the other. To reinforce the point (given that many choices might be made, but stereotypically are not) why didn't our fictional young man chose to become skilled at Australian Rules Football or even Kabaddi? These sports are not meaningful to him; he does not value them.

We need to free Csikszentmihalyi from his contradiction where he proposes Flow as a means of achieving meaning and enjoyment, while also admitting that Flow can be found in pursuits observers and individuals might find meaningless and discombobulating. However, we must be careful that whatever we propose still maintains much of the sense of Csikszentmihalyi's employment of 'autotelism'.

Autotelism and flow in games

One of the critical conditions of Flow presented by Csikszentmihalyi throughout his work is that the experience or activity should be 'autotelic'. A complete critique of the possibility or nature of autotelism is beyond the scope of this paper. It is important however to explore how Csikszentmihalyi has employed the concept, and what effect this employment has in the context of analysing engagement

with digital games. It is also critical to the argument put forward in this paper that we carefully account for Csikszentmihalyi's autotelism while discussing the value or worth of a play experience. That is, we do not want to destroy one of the pillars of Flow theory, while trying to account for a differential between experiences which should qualify as Flow. Essentially, we are trying to interpret and augment the description of Flow rather than deconstruct and weaken it.

Csikszentmihalyi defines 'autotelic' in this way:

"The term "autotelic" derives from two Greek words auto meaning self, and telos meaning goal. It refers to a self-contained activity, one that is done not with the expectation of some future benefit, but simply because the doing itself is the reward. Playing the stock market in order to make money is not an autotelic experience; but playing it in order to prove one's skill at foretelling future trends is – even though the outcome in terms of dollars and cents is exactly the same." (Csikszentmihalyi 2008, pp 67)

This description is similar to Apter's (1991) phenomenological state of 'paratelic', one of two opposing mental states an individual can assume toward an activity. In Apter's model an individual can assume a stance toward an activity in which action is taken in virtue of the ostensible purpose or goal; the 'telic', purposeful state, but in situations of relative safety the individual might take up a stance which ignores the normative goals. So the stock trader can flip back and forth between trying to maximise returns and, during periods of financial stability, trying different forecasting strategies. Csikszentmihalyi's version of autotelism and Apter's paratelicism differ in a couple of different ways. Apter's paratelic state of mind requires a protective frame. Engaging in the activity must feel relatively safe to the participant. Csikszentmihalyi's autotelic activity has no such 'magic circle' requirement (following the way Huizinga's (1938) term has been employed by Salen and Zimmerman (2004) to denote a reserved space for play), instead the disregard for extrinsic motivators is what characterizes autotelism in Flow. Whether it is dangerous, risky, or entirely safe and mundane is irrelevant as

whether an activity is autotelic is independent of the degree of danger or risk involved. Another difference is that Paratelic attitudes toward an activity may flip back and forth between telic and paratelic states of mind. Csikszentmihalyi makes no such condition of autotelism in Flow. The participant can approach an activity completely autotelically, the extrinsic motivations, if they ever existed, being irrelevant.

Essentially, autotelism is a phenomenological stance toward an activity where an individual intrinsically values the activity. The activity has value in and of itself, irrespective of any external value supposed of it, or that the products of the activity have imputed value.

Csikszentmihalyi also suggests that some individuals are more predisposed to find activities intrinsically motivating especially, and critically to the argument of this paper, if the activities are part of a structured life's purpose. That is, individuals who can structure their lives such that each activity they will find Flow in is also contributing to some greater meaning will find happiness and enjoyment in life.

Autotelism and value

When considering this issue of meaning; a meaning in one's life, a meaningful activity and so on we are obviously concerned with more than mere semantic or semiotic meaning. Csikszentmihalyi uses the term 'meaning' as if he is imploring individuals to find purpose in their activities and a purpose is surely some kind of telos. So in essence Csikszentmihalyi is arguing that for an activity to be autotelic, and for autotelic to hold true he does not intend that individuals engage in activities which are pointless, but that individuals personally find the purpose in and thus value an activity.

So the value is not intrinsically found in the occasion of the activity, but is found in an individual's personal sense of purpose; in their phenomenological stance toward an activity. In this sense an activity can be both autotelic and valued as it is the individual self (auto) determining the purpose (telos) of activities, rather than those

activities holding value intrinsically or due to some societal norm. The difference then between Flow activities which promote growth and enjoyment and those which promote pleasure devoid of meaning is the difference between the individual experiencer's sense of value relative to a broad self-actualising life goal (consider say Maslow's hierarchy of needs 1943 and 1954 for a famous example of a model exploring value and personal purpose).

The question remains then why Kubey and Csikszentmihalyi see no value in playing 'video games'. The answer seems to be that in general Csikszentmihalyi criticises passive consumption of experiences, such as watching television or reading pulp novels, as lacking in value. For Csikszentmihalyi most things of value lead toward personal improvement. It must be said though that such an extrinsic judgement of the meaning of an activity seems to work against his greater thesis of Flow, whereby the individual experiencer is tasked with finding the meaning and thus value of an activity, irrespective of external rewards and societal pressure. That is, surely an individual is free to find the meaning in playing videogames, just as some people find meaning in playing chess irrespective of the club scene or competition rewards.

It seems probable that Csikszentmihalyi has simply fallen foul of a trap he warns against. That of applying normative value judgements upon the activities of others. He seems in this instance to deny that videogames have the capacity to provide meaning for an individual. This apparent error is interesting however; it shows the power of cultural value systems and how they direct individuals' judgements of worth. The socio-cultural nature of value is an extensively studied area. For example Bourdieu extensively published on the different types of value or capital; breaking value down into three broad areas of human experience, the economic, the social, and the cultural (Bourdieu 1986), and how these values are held and negotiated by different kinds of people. It seems that if we look at the value types developed by Bourdieu Csikszentmihalyi clearly critiques the need for economic (wealth of money, property, and possessions) and social (friends, contacts, fame, influence) value in Flow, but deals poorly

with cultural capital (knowledge, skill, taste). That is, he seems happy to claim that meaning must be personally found, but allows culture to drive what is personally acceptable:

“Cultures are defensive constructions against chaos, designed to reduce the impact of randomness on experience. They are adaptive responses, just as feathers are for birds and fur is for mammals. Cultures prescribe norms, evolve goals, build beliefs that help us tackle the challenges of existence. In doing so they must rule out many alternative goals and beliefs, and thereby limit possibilities; but this channeling of attention to a limited set of goals and means is what allows effortless action within self-created boundaries.”

In this sense ‘value’, in a broad axiological sense which accounts for how ethics and aesthetics produce worth, can be said to be normative, driven by culture. Cultures form *habitus* (after Aristotle) in individuals, where each individual is enculturated into the value systems and norms of behaviour of the society which they in turn embody and enact unconsciously. So to say that people seek value in things is not to say that they necessarily seek financial reward or the adulation of peers and superiors (though these might be present), but rather that they seek to enact their cultural selves. One way of conceiving of this embodiment is Cooley’s looking-glass self (1902) where individuals evaluate themselves as if they were being evaluated by an observer. Using their own cultural value judgements, which they would naturally employ to evaluate other’s roles and statuses in society, back upon themselves. Cooley argues that through this process, we come to understand ourselves and our own place in society.

In this sense it seems that Csikszentmihalyi is suggesting that in order for Flow to lead to positive experiences, the Flow must yield personal but culturally relative worth. The error he might be making in his evaluation of videogames is assuming that his cultural habitus and current nexus of personal cultural value objects is the same as that of the young people he sees playing such games. His self-sense as an aging Croatian emigre to the United States of America,

who played Chess with a degree of skill in his youth allows him to see Chess as meaningful and life enriching, but not the videogames enjoyed by those he has observed, in spite of the potential similarities between the two activities. That is not to say that his evaluation is unique to his specific personal history and culture, as interviewing people of various backgrounds and ages who reject videogames or play few videogames yield similar evaluations of videogames as a 'waste of time' (Salisbury 2013). We might employ another concept from Bourdieu here. 'Legitimacy', where every sphere of human experience is evaluated by members of society according to the degree to which it is valued by the power structures within that society. That is if we were trying to understand why some people might see videogames as a waste of time over say listening to music or going to the theatre by way of a Sociological concept. However, we feel that at this point it is sufficient to say that some people, embodying their culture born of the nexus of values they have acquired, value some activities more than others. Exactly how the worth of a thing is measured is not entirely relevant to the purpose of this paper.

A Tenth Condition of Flow

In order to differentiate between those experiences of Flow which are meaningful and pursued, and those that are entropy inducing and eventually abandoned or rejected before participation through concern for the amount of time and effort they might 'waste', the resolution of this paper is to present a further clause into the nine conditions of Flow:

10: The activity must present an opportunity for meaningful growth of the self which is valued by the individual participant.

In this way we believe that it is possible to account for the differences between 'good' Flow and 'bad'. In employing this condition, we can now account for self-ascribed 'gamers' finding enjoyment in defeating a particularly tough game, as well as players who might

have spent some time absorbed in a game, but ultimately feel that the time would have been better spent in some other pursuit.

Conclusions and taking Value Based 'Flow' Forward

In terms of pure 'good Flow' it is difficult to see where design interventions might encourage it in a game or other activity. That is, in Csikszentmihalyi's conception of Flow, it seems that one of the greatest conditions is an individual's receptiveness to eschew social controls and approach activities from an autotelic position. That is, it is the individual who is autotelic (capable of acting without external drivers), rather than the activity. Csikszentmihalyi presents examples of individuals who approach every day activities with autotelic intent (Csikszentmihalyi, 1990); essentially gamifying their everyday experiences. However, he also presents the nine conditions of Flow listed above, so there is at least some sense that an individual needs to find themselves in an activity with the appropriate features or conditions, even if some of those conditions are self-imposed. Perhaps the closest game design interaction with this side of 'Flow' is in the idea of self-selected difficulty put forward by Chen (2007).

We argue that, in including the sense of cultural significance, which accounts for both social and individual values, it is reasonable to suggest that any activity which is valued by the participating individual has more chance of providing a Flow experience than one which is not individually culturally valued. The question becomes how one designs for the proposed tenth condition of Flow is one of designing for personalised cultural or axiological value. Outside of digital games design, there are some who argue that designing for value (after considering systems design, ergonomic design, and experience design) is the next phase in software design (e.g. Cockton, 2004). It is conceivable that much of the industry of games design, and thus games design practice will continue to take a fairly mechanistic approach to the design of games for short-term monetary returns. However, we could suggest that if games designers are striving for greater recognition of their products as culturally significant objects, and there is a will for games to avoid being seen

as a destructive, time wasting pastime, then the values embodied in games needs to be addressed as part of the design practice. More than the sense that games designers are striving for a recognition of legitimacy for their products though, it seems obvious that games which address the cultural values of enough players are more likely to be successful (by being valuable to those players) than those which only address the values of a niche.

If we add personal value to this discussions of designing game experiences, we see a subtle change come over the discussion. It becomes a question of what the player values about the gameplay experiences they participate in. These experiences include the feeling of acquisition or improvement of a particular skill (clearly ‘Flow’-like), the feeling of progress on to the next challenge (somewhat ‘Flow’-like), the feeling of being rewarded with loot, story or resources (explicit reward is counter to ‘Flow’), the feeling of making choices about things in the game you value (character appearance, moral character, friends), and other game experiences; this cannot be an exhaustive list.

It is clear that ‘Flow’ only accounts for a small number of these value based drivers. This points to an approach to game design that keeps ‘Flow’ as a way of thinking about certain design tasks, but moves it out of the centre of the design process. What becomes central is a core set of values that the game and gameplay encompasses and highlights. One of the ways this might be approached is to use Alan Cooper’s (1999) conception of the idealised user (or persona) as a central design process for capturing and embodying the designed values anticipated in the games audience. This could then allow for designing a game for a core persona audience that seek to improve a set of skills through increasing challenges using ‘Flow’ but equally designing a game with a persona with a different set of values and therefore a different approach to challenge; such as having an unvarying level of challenge.

Taking *Grand Theft Auto 4* as an example, this game has several structures that guide the player’s activity. The primary structure is

based on missions that have a mixture of gameplay activities and provide the player with a feeling of progress toward a goal and rewards the player with story cinematics. The secondary structure is player selected, usually location or vehicle based, gameplay activities that always require using the same set of skills, but with increasing difficulty (increasing skill based challenge). The first structure makes the player engage at least once in all the skill based activities involved in the games but usually only the lowest difficulty version of the activity. The values expressed in this structure (story, progress, sampling, life simulation) are not engaged with 'Flow'-like activities, however the second structure is entirely player selection driven and allows them to pursue a series of increasingly challenging skill activities that have been given value by the primary structure of the game.

Conceivably, this approach answers both of the questions, providing a core experience which engages an idealised player's values, and then offering opportunities to pursue increasing skill based challenges as a choice.

BIBLIOGRAPHY

Apter, M. 'A Structural Phenomenology of Play', in M. J. Apter and John Kerr (eds). *Adult Play*. Swets and Zeitlinger, Amsterdam, 1991.

Baron, S. 'Cognitive Flow: The Psychology of Great Game Design'. *Gamasutra*, http://www.gamasutra.com/view/feature/166972/cognitive_flow_the_psychology_of_.php, 2012.

Bourdieu, P. *Distinction: a social critique of the judgement of taste*. Cambridge, Mass.: Harvard University Press, 1984

Bourdieu, P. 'The Forms of Capital'. In J. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241–258). New York, NY: Greenwood Press, 1986.

Bourdieu, P. *The logic of practice*. Stanford, Calif.: Stanford University Press, 1990.

Brathwaite, B., & Schreiber, I. *Challenges for game designers*. Boston, MA: Course Technology/Cengage Learning, 2009.

Chen J. 'Flow in games (and everything else)'. *Commun. ACM* 50, 4 (April 2007), 31-34.

Cockton, G. 'Value-centred HCI'. In *Proceedings of the third Nordic conference on human-computer interaction* (pp. 149–160), 2004. ACM Press. doi:10.1145/1028014.1028038

Cockton, G. 'Making Designing Worth Worth Designing'. *Presented at the CHI'12 (2012)*, ACM.

Cooley, C. *Human nature and the social order*. New Brunswick (U.S.A.): Transaction Books, 1902.

Cooper, A. *The Inmates are running the asylum*, SAMS, 1999.

Cowley B., Charles D., Black M., and Hickey R. 'Toward an understanding of flow in video games'. *Comput. Entertain.* 6, 2, Article 20, 2008.

Csikszentmihalyi, M. *Beyond boredom and anxiety (1st ed.)*. San Francisco: Jossey-Bass Publishers, 1975.

Csikszentmihalyi, M. 'Some Paradoxes in the Definition of Play' in *Play as Context: 1979 Proceedings of The Association for the Anthropological study of Play* ed. Cheska, A. T. West Point, NY: Leisure Press.

Csikszentmihalyi, M. *Flow: the psychology of optimal experience (1st ed.)*. New York: Harper & Row, 1990.

Csikszentmihalyi, M. *Flow: the psychology of optimal experience (Perennial Classics ed.)*. New York: Harper & Row, 2008.

Csikszentmihalyi, M. *Creativity: flow and the psychology of*

discovery and invention (1st ed.). New York: Harper Collins Publishers, 1996.

Fullerton, T., Swain, C., & Hoffman, S. *Game design workshop: a playcentric approach to creating innovative games (2nd ed.)*. Amsterdam ; Boston: Elsevier Morgan Kaufmann, 2008.

Huizinga, J. *Homo Ludens: A Study of the Play Element in Culture*. Beacon Press, Boston, 1955, originally published 1938.

Kubey, R., & Csikszentmihalyi, M. 'Television Addiction'. *Scientific American*, (February), 2002.

Maslow, A.H. 'A Theory of Human Motivation.' *Psychological Review*, 50 (1943), 370-396

Maslow, A. H. *Motivation and personality*. New York: Harper and Row, 1954.

Rockstar Games. *Grand Theft Auto IV*. Take-Two Interactive, 2008.

Salen, K. and Zimmerman, E. *Rules of Play: Game Design Fundamentals*. The MIT Press, Cambridge and London, 2004.

Salisbury, J.H. (2013). *Playing with Value: Player Engagements with Videogames as a Negotiation of Net Cultural Worth*. PhD Thesis. Middlesex University, London.

Schell, J. (2008). *The art of game design: a book of lenses*. Amsterdam ; Boston: Elsevier/Morgan Kaufmann.

Sweetser P., and Wyeth P. 'GameFlow: a model for evaluating player enjoyment in games'. *Comput. Entertain.* 3(2005), 3

A Structural Model for Player-Characters as Semiotic Constructs

Daniel Vella

INTRODUCTION

The question this paper sets out to answer is a simple, and, perhaps, rather obvious one, but one that, to some extent, game studies has shirked from confronting directly. It is this: *what constitutes a player-character?*

It might seem strange to suggest that the player-character is an under-examined theme in game studies. Even if consensus on the central questions is elusive, the discourse of the player-character is more or less clearly defined, with established dialogues, arguments and counter-arguments drawing upon a broadly stabilized set of concepts. On the one hand, we find the argument that player agency can be made to cohere to the nature of a predetermined character through the shaping of “dramatic agency” (Murray 1997). Conversely, we can also identify the reaction stating that the nature of the figure as a vehicle for player agency renders notions of character irrelevant: it “just becomes a “cursor” for the player’s actions” (Frasca 2001), being understood purely in instrumental terms as a set of tools to be deployed by the player (Newman 2002). To this, in turn, is opposed the objection that “the steerable thing being discussed is a character, with an anthropomorphic nature and a character’s place within the interactive fiction world” (Montfort 2007). Emma Westecott (2009) suggests an application of puppet theory to the player-character. More recently, the discussion has taken new inflections in Kristine Jørgensen’s outlining of the conflict between player agency and the

constraints of a fixed, predetermined character (2010), or Clara Fernández-Vara's signaling of a radical split between player and character (2011).

As divergent as these positions are, in all these cases, the focus of research has tended to be “the framing of the relationship between the player and her player character” (Westecott 2009, 2) – not on the character itself. As such, “player-character” is often linked to “avatar”, in a recurring identification of a duality in the ontological nature of the anthropomorphically represented game entity under the player's direct control – a duality most fully mapped out by Rune Klevjer (2006, 10).

The entity behind this terminological duality, then, is a game component, one of the set of entities that constitute the game system. For lack of a better neutral term that lacks the implications of either “avatar” or “character”, this entity shall be referred to as the *playable figure* (Vella 2014). Its being the only game component over which the player is granted direct control gives it the status of an “avatar” – and, on this front, there is no shortage of critical perspectives investigating its formal, ontological and phenomenal nature (a by no means exhaustive sample might include Newman 2002; Rehak 2003; Linderoth 2005; Klevjer 2006, 2012; Bayliss 2007; Jørgensen 2009; Waggoner 2009; Mukherjee 2012). However, the game component and the character *are not the same thing*, and, as Klevjer argues, “there is, for analytical purposes, a lot to gain from keeping ‘character’ and ‘avatar’ distinct” (2006, 116). “Lara Croft”, aristocratic British adventurer, is not the computational entity that responds to the player's input, to which a particular audiovisual representation is attached. Rather, as a character, she is a “possible non-actual individual” (Margolin 1990, 844), a member of a diegetic world. The game component over which the player is given control, together with its associated audiovisual elements, is only a sign that *represents* this possible individual, engaged in a semiotic process of signification that still needs to be mapped out.

WHAT IS A CHARACTER?

By and large, when opposing “character” to “avatar” – and bracketing situations, such as James Paul Gee’s description of the “virtual character” as “the player’s surrogate” (2008, 259), in which “character” simply becomes another term for “avatar” – game studies has taken for granted the idea that “character” refers to the impression of an individual with its own identity, without considering how this impression is formed. Noting the consternation faced by players of *Crysis* (Crytek 2007) when the avatar suddenly begins to speak in his own voice, Jørgensen writes that “the avatar gives the impression of suddenly turning from being completely controlled by the player into being an individual and autonomous being with a will of his own” (2009, 3). In the same vein, Bayliss writes that “the avatar is also a character, that is, an entity constituted separately from the player” (2007, 2), and Fernández-Vara argues that the identity of a defined player-character “sets them apart from the player, emphasizing the gap between character and player” (2011, 13). While the existence of this independent individual – or, at least, the impression of it – is acknowledged, questions regarding its ontological make-up, and the formal techniques by which it is produced, have not been tackled to a sufficient degree.

Perhaps this is because characters – those “images of possible people” (Phelan 1989, 2) routinely encountered, not only in games, but also in novels and short stories, on TV, on stage or at the cinema – are “so familiar a phenomenon that they do not seem to require closer inspection” (Eder et al. 2010, 3). However, literary theory in particular has, for some time, recognized that “once they are subject to closer scrutiny, characters prove to be highly complex objects” (ibid.). For this reason, an approach to the analysis of player-characters must be built on solid conceptual ground regarding the more basic question, “What is a character?”

Since it is within the field of literary theory that this question has been most thoroughly tackled so far, it is in this direction that this paper shall turn first. The aim in adopting a literary-theoretical perspective

on character is that of arriving at a foundational understanding of what is entailed in the notion of a ‘character’, which can then, in this paper’s later sections, be used as the basis for mapping out an approach to the player-character.

The problem presented by the constitution of a character takes its shape in Uri Margolin’s definition:

“Character” or “person” in narrative will be understood as designating a human or human-like individual, existing in some possible world [...] a Narrative Agent (=NA) to whom inner states, mental properties (traits, features) or complexes of such properties (personality models) can be ascribed on the basis of textual data. (1986, 205).

In other words, the problem lies in the necessity of bridging the gap that opens up between the impression received by the reader of a living, breathing individual, and the reality that, if we were to identify any concrete ontological existence for this individual, we would come up only with a limited set of textual signs.

This duality in the meaning of the term ‘character’ has led to a duality in theoretical approaches. As Henriette Heidbrink writes, there exists:

...a continuum between ›abstraction‹ and ›concretion‹, whereas the first pole stands for the medial material, the text, the signs, or the structures of the medial product and the second pole stands for the character that is via reception perceived as a humanlike entity with a coherent self including an individual personality (2010, 72).

Heidbrink argues that a debate has taken shape along the lines of this dichotomy, between what she terms “humanistic” positions that focus on the analysis of characters as individuals that can, for critical purposes, be considered independently of the text, and those grouped under the banner of “formalists, structuralists and semioticians” (ibid., 73), who dismiss this impression of a human individual as an extraneous accretion to a set of semiotic data, and, as a result, develop

a perspective according to which characters “dissolve into textuality”, in Shlomith Rimmon-Kenan’s phrase (1983, 31).

This dichotomy can be summarized, in semiotic terms, as one between an idea of character as a signifier and as a signified. Rimmon-Kenan puts it succinctly when she says the distinction is between understanding characters as “words” or as “people” (*ibid.*). It is in the apparently paradoxical co-presence of both understandings that the true ontological nature of a character is to be found. The irreducible individuality of a character as a possible non-actual individual, marked out by the proper name as its symbol, as well as by the essential nature that name stands for (Genette 1980), is an illusion constructed through an accumulation of textual signs, and, in understanding the nature of the character, its “verbal surface” is as crucial as the “suggestion and imitation of human life” it establishes (Price 1983, 57).

As such, it is in the apparently paradoxical co-presence of both understandings that the true ontological nature of a character is to be found. The impression of a human individual can only be understood in the light of the system of signifiers out of which it is generated, and the same set of signifiers only makes sense with reference to the total impression towards which it is oriented. Given that a set of semiotic elements within a text can only be grouped under the unifying aegis of a ‘character’ if the individual signs are, in the first place, recognized as pointing towards the same figure, then such a figure (to which one can only apply the label of a human individual, albeit not necessarily an actual one) must have been posited, and kept in mind, during the act of reading – a purely semiotic approach would thus be guilty of the a posteriori erasure of a unified figure that must necessarily have been already established in the act of reading for that reading to have taken place. It is in this light that, to use the terms suggested by James Phelan (1989), a character is both mimetic, a (re)presentation of a possible person, and synthetic, a textual construct constituted of signs (1989, 2).

A SEMIOTIC-STRUCTURAL MODEL OF A CHARACTER

It is apparent enough, however, that in its basic constitution, a ‘character,’ if one were to adopt a bottom-up textual-analytical approach, is a semiotic construct, a figure that emerges through the accretion of a set of textual signifiers. It is necessary, then, to found an ontological understanding of the player-character, at the most radical level, on an identification of the signifying elements out of which it is accrued.

Existing theorizations of the player-character

It is hard to locate, within game studies, a rigorous theoretical framework by which such a task can be achieved. As with any rule, of course, exceptions exist: a survey of the relevant literature reveals three models that can be employed in orienting this investigation towards the task of achieving such an ontological understanding of the player-character. These are the approaches to the player-character proposed by Fernández-Vara (2011), Lankoski, Heliö and Ekman (2003) and Schröther and Thon (2014).

Fernández-Vara suggests a list of the “identity markers” of the player-characters as being “name, image, animation, speech, back story” (2011, 10). While this is a start in determining the constitution of the player-character as a textual entity, it does not go far enough in taxonomizing the various avenues by which characterization might occur, nor does it account for the specificities of the character in question in its association with a playable figure under the player’s control.

This was precisely the difficulty tackled by Lankoski, Heliö and Ekman in their earlier attempt to analyze the constitution of player-characters (2003). Starting with reference to Rimmon-Kenan’s discussion of the nature of literary characters, their model attempts to expand the understanding of the ways in which the determination of a character can also occur through game-specific means, suggesting the ways in which the ‘player’ side of the dual term ‘player-character’

must reshape the understanding of the ‘character’. In this regard, their insights are invaluable, and shall be drawn upon throughout the course of this chapter. At the same time, however, non-ludic modes of characterization are bracketed and set aside from the main thrust of their analysis, missing the potential to arrive at a unified understanding of the specification of player-characters that fully integrates all possible avenues of characterization available to games as a hybrid form that also incorporates non-ludic medialities.

What remains necessary, then, is a model that weds Fernández-Vara’s taxonomical approach towards the semiotic aggregation of the character’s textuality to Lankoski, Heliö and Ekman’s acknowledgment of the player’s role in the constitution and determination of this textual whole. Arriving at such a model would appear to be Felix Schröter and Jan-Noël Thon’s aim: their approach to theorizing the player-character is built on the observation that “the ways in which characters are represented in contemporary video games cannot and should not be reduced to either interactive simulation or ‘predetermined’ narration,” given that the player-character “is constituted precisely by the complex interplay between these two modes of representation” (2014). This leads to the argument that there are three modes by which the ‘character’ in ‘player-character’ is conveyed: the *mode of narration*, the *mode of simulation* and the *mode of communication*. Moreover, these three modes of representation are linked to three dimensions of experience of the character: respectively, Schröter and Thon term these the “narrative experience,” the “ludic experience” and the “social experience” (ibid.).

According to this model, *mode of narration* refers to the understanding of a character that most closely aligns with the understanding we have identified in literary theory. It serves as the basis for the narrative experience of the character, in which “the player perceives game characters as identifiable *fictional beings* with an inner life” (ibid.). The *mode of simulation* addresses the player-character’s status as a game component within the game system, and establishes a ludic experience, in which “the player’s attention is

focused on characters as [...] game pieces that are defined by game-related properties such as ‘health points’, ‘speed’, ‘special abilities’ and so on” (ibid.). Finally, the *mode of communication* accounts for the fact that the player-character can, especially in the context of a multiplayer game, constitute a means of self-expression on the part of the player, leading to a social experience in which “players not only form mental models of a fictional being or game piece but also of the player ‘behind’ the avatar, resulting in a connected or mixed representation which includes features of both” (ibid.).

Schröter and Thon’s argument, then, provides an insight into the multimodal nature of the player-character as a composite entity, defined by a tripartite ontology as “fictional entity, game piece, representation of the player” (ibid.)). However – despite the fact that their paper goes on to offer productive analyses of player-characters in *Spec Ops: The Line* (Yager Development 2012), *The Elder Scrolls V: Skyrim* (Bethesda Game Studios 2011) and *Star Wars: The Old Republic* (Bioware 2010) – their research stops short of integrating these multiple modalities into a unified structural model of the player-character as a semiotic construct. It does not, for instance, take into account how the ludic properties of a player-character might contribute to the concretization of the image of a human or human-like individual, which is considered as operating purely through what Schröter and Thon term the mode of narration. For this reason, we shall now propose a new semiotic structural model of the player-character, in an attempt at bringing together these disparate dimensions of characterization.

A taxonomy of “characterization statements”

Arguably the most comprehensive and fully-developed structural model of a character is that proposed by the narratologist Uri Margolin. According to his model, the basic building-blocks of a character, on the textual level, are what he terms *characterization statements* (1986, 206). A characterization statement (hereinafter CS) is a textual cue from which some attribute or trait pertaining to a character can be inferred. As the reader engages with a text, she

will encounter a sequence of CSs for any given character, and will interpret each CS as an insight into some aspect or trait of the character in question. Margolin refers to this process of “the ascription of individual mental traits” or factual attributes to a textual individual on the basis of an inference from a CS as *characterization* (ibid.).

A character is therefore always a product of a second-order process of signification – Margolin notes that a “character or person is a signified, for which some other textual elements serve as signifiers” (ibid.). Moreover, the inferential nature of characterization reveals a considerable level of ambiguity at work. Most CSs accommodate multiple readings – different, perhaps even directly contradictory, character attributes can be inferred from the same CS depending on how it is interpreted by the reader. This is the point made by Roland Barthes in his influential reading of Honoré de Balzac’s *Sarrasine*:

“To read is to struggle to name, to subject the sentences of a text to a semantic transformation. This transformation is erratic; it consists in hesitating among several names: if we are told that Sarrasine had ‘*one of those strong wills that knows no obstacle*’, what are we to read? *will, energy, obstinacy, stubbornness, etc.*?” (1974, 92)

This understanding leads us to conceive of a “character” as a mental construct arrived at by the reader, built up piece by piece, in puzzle-like fashion, through the gradual accumulation of CSs. This is the process that Margolin terms *character-building*, which “consists of a succession of individual operations of characterization, together with second order activities of continual patterning and repatterning of the traits obtained in the first order operations, until a fairly coherent constellation or trait paradigm has been arrived at” (1986, 206) – an observation which recalls Seymour Chatman’s earlier delineation of a character as a “paradigm of traits” (1980, 126). As Rimmon-Kenan puts it, “if a common denominator, e.g. ambivalence, emerges from several aspects, it can then be generalized as a character trait, and in a similar way the various traits combine to form the character” (1980,

38). The result of this is that “character can be seen as a tree-like hierarchical structure in which elements are assembled in categories of increasing integrative power” (ibid., 37).

Margolin’s next step is to offer a taxonomy of the possible categories of CSs, thereby mapping out the semiotic foundations upon which the hierarchical signifying structure of a character is established. A caveat is necessary: the very term Margolin chooses – *characterization statement* – implies a mediality of character founded on linguistic propositions. As such, Margolin’s taxonomy must be modified to fit the specificities of the player-character – not only through taking into account the fact that games, as “integrated crossmedia packages” (Aarseth 2012, 2), set in motion a polymodal semiotic presentation that can include visual, verbal, aural as well as purely ludic signs, but also, as *Lankoski*, Heliö and Ekman do, taking into account the role of the player in the determination of the textual unity constituting the player-character.

Nonetheless, Margolin’s basic distinction between three categories of CSs – *static mimetic elements*, *dynamic mimetic elements* and *formal textual patterns* – is a solid initial stepping-stone in coming to terms with, and attempting to arrive at a comprehensive categorization of, the complete span of modes of CSs games afford in relation to their player-character/s.

This is the task to which the rest of this paper shall be dedicated. Though reference will also be made to a range of other games and player-characters, this categorization shall be framed through a close analysis of the player-characters in *The Last of Us* (Naughty Dog 2013) and *Gone Home* (The Fulbright Company 2013). *The Last of Us* – a third-person action-adventure game with a post-apocalyptic theme in which the player controls Joel, a hardened survivor, from a third-person perspective – was chosen as an example of a game whose high production values and adherence to the medial and generic conventions of audiovisual narrative result in a highly specified player-character constituted of a dense, multi-medial network of CSs. By way of contrast, *Gone Home* – a first-person exploration game

in which the player takes on the role of Kaitlin Greenbriar, a young woman returning to her family home after a year in Europe – was selected in order to provide an opposite case, where the player-character is minimally specified and, if it is to emerge as a character at all, requires far more in terms of reconstruction on the reader’s part.

Though the examples of Joel in *The Last of Us* and Katie in *Gone Home* shall form the foundation for the categorization of CSs pertaining to player-characters, a range of other player-characters in other games shall also be referred to as and when they become relevant. This shall serve both to contextualize the two primary examples, and to offer a wider perspective on the range of possible avenues of characterization relating to player-characters.

STATIC MIMETIC ELEMENTS

In Margolin’s classification of CSs, *static mimetic elements* refers to statements regarding fixed (or relatively fixed) facts regarding a character, including “name, appearance, customs, habits, man-made and natural setting or environment” (1986, p.206). Of course, with respect to a literary character, these elements might change drastically over the course of a narrative. How much that is true of Jane Eyre at the start of Charlotte Brontë’s novel, as a ten-year-old living in the Reed household, remains true of Jane Eyre, the experienced, financially independent woman at the novel’s end? The same is true of player-characters in games, who are capable of undergoing radical transformation over the course of a playthrough while remaining, recognizably, the same character. For example, Jodie Holmes in *Beyond: Two Souls* (Quantic Dream, 2013) is glimpsed (and played) at various stages in her life: as a toddler, a young girl, a teenager and a young woman. In between these scenes, many of the static mimetic elements undergo radical shifts: her appearance changes, her costumes are different, her environment – and the role she plays within it – vary, and so on. Moreover, with specific reference to the category of static mimetic elements that are termed “ludic elements” below, we can note that “character development” as a game mechanic is a defining feature of the role-playing game genre. This

demonstrates the fact that the mutability of player-characters is itself an accepted trope, and that the usage of the term *static mimetic elements* no more implies a rigidly unchanging nature for player-characters than it does for literary characters – contrary to Frasca’s suggestion that “most videogame characters would be flat” (2001, 1), a reference to the novelist E.M. Forster’s definition of flat characters as those that “do not change throughout the course of the work” (1995).

With that caveat out of the way, we can propose a subdivision of static mimetic elements associated with the player-character into three categories. *Represented elements* shall refer to CSs delivered through audiovisual or linguistic signs attached to the figure in question. *Contextual elements* covers CSs that convey information regarding the character’s place in their environment. Finally, *mechanical elements* describes the set of CSs which can be inferred from the structure of the figure as a game component.

Represented elements

i) Name

A player-character’s name is often the first CS a player encounters. It can reveal the individual’s gender and, to a considerable extent, their socio-cultural background – “Mario”, for instance, signals the iconic plumber’s Italian ethnicity. A character’s name can also bear symbolic significance, being used to highlight important traits or attributes, or to reveal the character’s function in the narrative – think of how Gordon Freeman’s surname in *Half-Life 2* (Valve, 2004) signals his role as the “free man”, striving for humanity’s freedom in the face of the oppressive Combine occupation.

In *Gone Home*, the name Kaitlin Greenbriar (or its shortened form, Katie) lets us know that the character is female, and probably of Anglo-Saxon descent – an ethnicity that, in the context of the US in the 1990s, suggests, at the very least, the strong possibility of a life of upper- or middle-class privilege. As a derivative of “Catherine”,

Katie's given name shares the Greek etymological root καθαρός (*katharos*), meaning "pure" – a fact which might color our initial impression of the kind of person she is. By contrast, in *The Last of Us*, the given name Joel – no surname is ever provided – seems to purposely reveal little about the game's protagonist, apart from a down-to-earth everyman quality. The lack of a surname – a quality which extends to all the non-player characters in the game, all of whom are referred to only by their first name – also serves to communicate the dissolution of societal structures in the game's post-apocalyptic setting.

ii) *Physical appearance*

Along with the name, the player-character's physical appearance is often what constitutes the first impression of the textual individual that the player is encountering. With regard to our case studies, physical appearance plays a greater role in *The Last of Us* than it does in *Gone Home*. Given the latter's first-person perspective, combined with the slightly disconcerting lack of mirrors in the Greenbriar family home, the only images of Katie that the player receives are her passport photograph, and the family portrait hanging in the entrance hall. Apart from locating her, thanks to her hairstyle, in the game's period setting, these two images are most notable for their pointedly mundane quality, which aligns with *Gone Home*'s general stylistic direction. In *The Last of Us*, Joel's appearance – full beard, weathered features, slim but muscular build, slightly graying hair, hard, clear eyes – gives the player more to go on. It is easy to detect an earthy, no-nonsense masculinity. It is just as easy to gain the impression of an individual who bears the mark of long suffering, who has been shaped by having to survive in his harsh, post-apocalyptic conditions, and whose best years are behind him.

iii) *Costume/s*

Lisbeth Klastrup and Susana Tosca have applied fashion theory to their study of players' choices when clothing their avatar in *World of Warcraft* (Blizzard Entertainment 2003), noting that "the way our

characters look is important to us,” being able to signal the player’s status, group allegiances and individual style (2008, 4). Though this study was focused on the social role of costume in *WoW*’s multiplayer environment, its central insight – that the outfit worn by a playable figure can serve (indeed, can hardly choose but function as) a rich layer of signification – is one that can be extended to the playable figures of single-player games. Again, the outfit/s a player-character wears can be indicative of many things. Costume can signal the character’s belonging to a particular social group, nationality, organization or historical period – whatever gender, race and appearance the player chooses for Shepard in *Mass Effect* (BioWare, 2007), for instance, he or she wears the uniform of the *SSV Normandy*. Clothes can also highlight a character’s adherence to a particular subculture – Ben in *Full Throttle* (LucasArts, 1995), with his biker’s leather jacket and boots, is the perfect example – or associate a character with a familiar set of generic iconography, as Lewton’s trenchcoat and fedora in *Discworld Noir* (Perfect Entertainment, 1999) locate him firmly within the detective-noir tradition, despite the fantasy setting in which he is placed.

Joel’s plain, utilitarian work clothes associate perfectly with the masculinity of his physical appearance, adding to the impression of an individual who is oriented towards manual labor and physical action, and who gets his hands dirty. Their worn, stained nature also suggests having lived through hard times. Finally, his clothes also associate him with the Western genre, even further adding to the conglomerate of CSs which mark him out with such familiar – indeed, cliché – attributes as “masculine”, “tough” and “stoic”. On the other hand, what little we see of Katie’s outfits in *Gone Home* – in the family portrait, she is wearing a plain, formal black dress – provides us with little on which to base a CS.

iv) Voice

If a character speaks, independently of what they say, the nature of their voice – its physical qualities, any traces of an accent, vocal tics or habitual mode of speaking – can constitute a CS. Mario’s

cheerful disposition and Italian accent, at least since he was first voiced in *Super Mario 64* (Nintendo, 1996), are major elements in his characterization, even on the basis of only a handful of phrases; and, in *Thief: The Dark Project* (Looking Glass, 1998), it is Garrett's frequent, characteristically gravel-voiced interjections that constitute one of the primary avenues of characterization. Even a lack of voice can in itself become a CS, as in the case of the notoriously tight-lipped Gordon Freeman.

Katie's only vocal utterance in the game is the message she leaves on the family's answering machine: this message is played at the start of the game, and is played again if the player chooses to listen through the messages stored on the answering machine. Her voice seems upbeat – she speaks rapidly and confidently. With *The Last of Us*, Joel's gruff, often mumbled vocal delivery emphasizes a reserved, somewhat introverted disposition – and we might be tempted to also detect a resigned weariness, which would chime with Joel's haggard appearance.

v) Animations

As Westcott notes, player-characters possess a pre-determined “constrained gesture set” (2009, 5), and the nature of this gesture set can affect the player's perception of the character to a great degree. The same action can be interpreted as revealing radically different character traits depending on how it is animated. Mario's joyful leap in *Super Mario 64* and Nathan Drake's athletic but desperate, edge-grabbing scramble in *Uncharted: Drake's Fortune* (Naughty Dog, 2007) might animate what is, at heart, the same ludic action, but the difference in the attendant animation results in the action registering as a very different CS in the respective cases.

Once again, animations are not a factor at all in *Gone Home*. However, in *The Last of Us*, Joel's animations serve to reinforce many of the characteristics suggested by his physical appearance. His movements are heavy and deliberate, revealing a steady, meticulous character, but also one who performs actions swiftly, decidedly and

forcefully. The gruesomeness of the animations whenever Joel performs a violent action – such as strangling a human enemy, or smashing a clicker’s face in with a brick – are equally significant. We can read “confidence” and “experience” in the efficiency of the actions, and, in their cold brutality, also an indication of a character who has grown desensitized to the violence that is necessary for his survival.

Contextual elements

i) Possessions

The objects a player-character has in their possession can function as vehicles for CSs. In *Beyond Good & Evil* (Ubisoft 2003), for example, Jade’s possession of a camera metonymically indicates her journalistic professional background. This applies both to objects that are modeled as meaningful components within the game system, that can be picked up, used, carried in the character’s inventory or be otherwise interacted with (what Aki Järvinen would term “components-of-self” (2008, 64)), and to objects which are not part of the game system and exist only as semiotic “window dressing”: to use the ontological distinction proposed by Espen Aarseth (2007), both representational and represented objects can convey CSs as long as they are in some way associated with the character in question. In *Deus Ex: Human Revolution* (Eidos Montreal 2011), for example, the books lining the shelves of player-character Adam Jensen’s apartment, even though they are little more than a texture on the wall, act as a particularly effective exposition for Jensen’s interests and preoccupations.

At the beginning of *Gone Home*, the only objects in Katie’s inventory are her passport and her flight ticket. Both items – together with the travel bag laid on the porch in front of her feet at the game’s opening – serve to contextualize her arrival at her family’s new home after a long period of absence, filling in the details of a year spent traveling around Europe. We might also read these as indications of an adventurous, open-minded personality. Joel’s possessions, on

the other hand, are comparatively scant, and constitute only what is necessary for survival in the hostile post-apocalyptic environment – a flashlight, a gun, a limited supply of ammunition. Again, the indication here is of an individual who, whether by natural inclination, by the demands of his situation, or by some combination of both, eschews anything but the bare necessities of survival.

ii) *Environment*

Much can be gleaned regarding a character based on the physical setting in which, by necessity or by choice, they find themselves. The idyllic, Arcadian milieu of Hyrule reveals as much about Link in *The Legend of Zelda: Ocarina of Time* (Nintendo 1998) as the opening tour of the Black Mesa Research Facility in *Half-Life* (Valve 1998) tells us about the kind of life led by Gordon Freeman. This is particularly true of games which allow the player to explore their character's home, an activity which, indirectly, becomes a means for the player to explore the character she is playing. *Heavy Rain* (Quantic Dream 2010), for example, uses domestic spaces as an efficient means of conveying its various player-characters' lifestyle, habits and preoccupations. Ethan Mars' personal crisis following the death of his son and his separation from his wife is expressed through a contrast between the bright, airy, clean-lined home he lives in at the start of the game, and the dingy, disorganized tenement he moves into after the incident.

At face value, *Gone Home* is a game entirely about Katie returning home – however, due to her family having moved house during her time in Europe, the house she is returning to is not, strictly speaking, her own. The room prepared for her is still un-lived-in, full of stacked-up boxes still to be unpacked. This frames Katie's traversal of the house as an exploration of an unknown milieu, rather than as the titular homecoming. Importantly, this aligns her unfamiliarity and curiosity about the space with the player's own, making it easier for the player to inhabit the subject-position she represents (Vella 2013). At the same time, this dissociation from her family home can also

itself be read as a CS, revealing her traveler's alienation from the once-familiar setting she has returned to.

At the start of *The Last of Us*, the environment Joel has to exist in – the military-policed quarantine zone, with its strict rations and regulations, and the dangerous ruined city that surrounds it, ridden with armed bandits and with the infected – contextualizes much of what we have read into Joel's own representation, making more sense of his weathered appearance, his utilitarian clothes and possessions, his weary voice and his determination.

iii) Role

What is the character's role in their environment? Here we might consider such factors as a character's job or profession, their belonging to organizations or groups of any kind, and the relations between the character and non-player characters (NPCs).

As a college-age young woman from what appears to be a reasonably affluent family, Katie's decision to take a gap year and travel around Europe instantly frames her – however right or wrong this framing might be – as a recognizable stereotype. It signals “adventurousness”, but in a predictable, conventionalized gesture. More interesting are her relationships to the members of her family. We have already touched on Katie's alienation from her family resulting from her time away – though the postcards found throughout the house mark an effort to retain contact, and the personal comments addressed to individual members of the family suggest intimacy and a keen observer's eye. Moreover, Katie appears to play the role of a confidant to her younger sister Sam, who trusts her enough to share her deepest secrets and feelings with her.

At the start of the game, the player learns that Joel is a smuggler, working within a criminal underground to deliver goods through the borders of the quarantine zone. Later, when Ellie and he arrive in Pittsburgh and are ambushed by a gang of desperate bandits, Joel reveals that he had been involved in such ambushes on unsuspecting

survivors himself in the past. This might lead the player to ascribe to him traits of amorality, unscrupulousness or – more mildly – opportunism driven by necessity. However, during the course of the game, against the background of this shadowy past, Joel is, to a considerable extent, defined by his relationship with Ellie once she is placed under his care. It is on the ambiguous implications of the relationship – which can be called paternalistic and protective, but also, less charitably, possessive and obsessive – that Joel’s characterization is founded.

Ludic elements

The sub-category of static mimetic elements we are terming “ludic elements” – with a reference to Schröter and Thon’s discussion on the ludic attributes of the player-character (2014) – is a particularly interesting one, and, thus, warrants a preliminary elaboration. In the introduction to this paper, a crucial distinction was highlighted between the game component under the player’s control and the character as a possible individual implied through a network of signification. However, it is precisely through being represented by a game component that the player-character gains one of its most prominent medialities. In other words, the attributes of the player-controlled figure as a game component – its capabilities and limitations in relation to the other entities in the gameworld, the procedures by which it functions within the game system – can themselves become a vehicle for characterization. As such, unlike the other categories of CSs we have considered so far, CSs based on ludic elements, as the name suggests, operate through a mediality that is strictly unique to games.

i) Capabilities and Limitations

Considered as an avatar, the figure under the player’s control is, to a great degree, defined by the capabilities it grants the player to affect the other entities making up the gameworld. This is the sense in which Newman speaks of avatars, instrumentally, as “sets of capabilities, potentials and techniques offered to the player” (2002), and in which

Klevjer, drawing on Maurice Merleau-Ponty's embodied phenomenology, discusses the avatar in light of the "I can" it allows the player to direct towards the gameworld (2006). For our current purposes, however, what interests us is how these capabilities can be put in the service of characterization. Once we agree that the game component we have referred to as the figure can, when considered through a diegetic frame, be grasped as a character, then it must follow that its attributes as a game component, framed through the same diegetic perspective, must be understood as representations in a ludic mediality of that character's abilities in relation to their world – and, hence, an especially direct and revealing form of CS. The consideration of the figure's game-systemic affordances as defining the nature of a player-character as character also has an inverse aspect. If the player-character is defined by what they can do in the gameworld, they are equally defined by what they cannot do.

Though she does not specifically invoke the question of character, this is what Janet Murray hints at when she writes that, for interactive drama to be successful, "participation in an immersive environment has to be carefully structured and contained [...] the range of allowable behaviors should seem dramatically appropriate to the fictional world" (1997, 106). In this regard, Lankoski, Heliö and Ekman state that "limiting a player's freedom is an effective and frequently used method of creating personality to [sic] the protagonist character" (2003, 2); Nick Montfort writes that the player-character should be understood as "a constraint and possibility defined by the author, within which the interactor is bound to a particular perspective and a particular set of capabilities" (2007, 145); and Peter Bayliss argues that the limitation of the playable figure to a predefined set of action possibilities "highlight that the avatar is also a character" (2007, 2).

In a later paper, Lankoski expands on this point, engaging in an analysis of the fighting game *Dead or Alive 3* (Team Ninja 2001) that takes as its starting-point the observation that "each selectable PC [player-character] attacks differently" (2011, 298). This leads, he argues, not only to a ludic differentiation between the various

playable figures, each of which, in the fighting game tradition, grants the player idiosyncratic tactical advantages and disadvantages – with some, for instance, having slow but powerful attacks, while others are defined through nimble movement. Lankoski’s argument is that *Dead or Alive 3*’s “*predefined functions and possible and impossible actions* (i.e., the kinds of attacks a character is able to do)” allow it to “distinguish different PCs from each other,” (ibid., 300) not only as game components, but also as characters. The reason for this is that it is the actions available to her through the particular playable figure she has chosen that will determine:

...whether a player will try to fight using counterattacks, powerful attacks, or faster and weaker attacks. Consequently, a player will project intentions to the character, and those projected intentions are likely to influence the perceived personality of the character. (ibid., 298)

Lankoski’s insight here is indispensable, not only insofar as it highlights the manner in which the playable figure’s capabilities and limitations act as meaningful CSs, but also in paving the way for a discussion I shall soon move on to: namely, that of accounting for the way in which actions performed by the player can be taken up in the service of characterization.

Katie’s capabilities in *Gone Home* do not go far. Apart from the basic spatial abilities of looking and moving conventionally associated with the first-person perspective, the only capabilities she has are picking up and examining objects in the environment, and interacting with household objects by means of a single, context-sensitive “use” command (for instance, turning light switches on or off). Where Katie’s abilities go beyond this basic set is in her capacity to scrutinize objects: when Katie picks up an object, she can zoom in to examine its details, and rotate it to view it from every angle. With progress in the game depending on scouring mundane items – crumpled notes and receipts, old magazines and school assignments – for clues, this close scrutiny becomes a major aspect of Katie’s

character, as we perceive it in the game: we might deduce from this a CS defining Katie as a good observer, or as a meticulous personality.

Joel's capabilities in *The Last of Us* are largely defined by the game's adherence to the third-person action-adventure genre. As such, the ability to walk, run, move stealthily, take cover, use firearms and engage in melee combat constitutes the standard set for this genre: if we are to identify any meaningful CSs here, they must lie either in idiosyncratic emphases or nuances within this conventionalized set, or in the way(s) in which these affordances are contextualized. In the first case, the two additions to the generic action-adventure set of affordances are Joel's "listen mode" – effectively similar to x-ray vision, allowing the player to identify the locations of enemies hidden behind walls – and his ability to pick up the discarded bottles or bricks littering the gameworld and put them to a variety of uses, throwing them to create a distraction or using them as projectile or melee weapons. Taken together, these affordances emphasize a strong sense of spatial and environmental awareness, privileging careful, studied planning. In the second case, the orientation of the essentially violent set of affordances towards a setting which, as we have described, is almost constantly life-threatening frames the violence, at least initially, as necessary, desperate self-defense rather than as unwarranted aggression – though, as these acts of violence accumulate and escalate throughout the course of the game, the player might be forced to reconsider this initial assumption about Joel's attitude towards his own violent acts.

ii) *Passivities*

It is not enough to consider what the player-character can and cannot do in its relation to the other entities in the gameworld. Crucial to their status as individuals inhabiting a world is their capacity to be influenced by other entities in the gameworld. Klevjer illustrates this point by arguing that Lara Croft is not only defined by the "ability to jump or walk", but also by being open to the "risk of *falling down* the ravine" (2012, 18). As such, player-characters are also defined by what we might term their *passivities* – the ways in which they are

passively open to the influence of other entities in the gameworld. Most often, this influence is a negative one, as in Klevjer's example, but it is not necessarily so.

Once again, Katie appears to be quite limited in this regard: she is not physically affected in any way by any other entity in the gameworld. Joel, on the other hand, is vulnerable to a great number of threats presented by his post-apocalyptic milieu and its inhabitants. A face-to-face encounter with the more dangerous types of infected frequently results in instant, unavoidable death. There are also numerous environmental threats: areas infected by fungal spores require Joel to put on his gas mask or risk infection, and he is also liable to drown in the frequent sections where he must venture underwater to clear a path ahead. This fragility in the face of an extremely hostile environment further contextualize Joel's affordances, framing them even more clearly as the necessary way of life he has had to adopt in order to survive.

iii) Goals

The player-character's capabilities are not meaningful in isolation: they gain their significance through being set to work towards a goal or set of goals (Vella 2013, 6). The same is true of passivities, that only gain meaning through being understood as hindering or facilitating the achievement of the goal/s in question.

These goals – whether set by the game or self-imposed by the player – are, by definition, the player's own, ludic goals. At the same time, however, they can also be attributed to the player-character as a distinct individual: this results in what Lankoski termed a “goal-related engagement” between the player and her character (2011, 297). More importantly for our current purpose, this means that the ludic goals assigned to the player, when grasped as the player-character's goals within the gameworld, can serve as yet another CS layer – “goals are a very powerful tool of presenting the nature of a character” (Lankoski, Heliö & Ekman 2003, 5).

Katie's goal in *Gone Home* is investigative: she is placed in the detective role in a textbook example of an embedded narrative structure (Vella 2011, 8), piecing together events that took place before her arrival on the scene. Her goal, then, is to deduce the events that have taken place in her family's life during her time away. As a CS, this is open to being read in a number of ways: it could be interpreted as connoting nothing more than an idle, detached curiosity on Katie's part, or it could be read as her displaying worry and concern for her missing sister.

Joel's overarching goal is to protect Ellie, and to escort her safely to the end of the game: this frames his capabilities for action and violence in a very different perspective compared to if these capabilities were employed towards ensuring only his own survival. Where these capabilities – and the actions that result from putting them to use – could have been read as simply demonstrating a fierce hunger for survival and a drive for self-preservation, they are instead recontextualized as demonstrating paternal care and protectiveness.

iv) Attributes

Player-characters are also determined, in a perhaps even more direct manner, by means of their statistical attributes. These can be made available to the player as direct statistical values – as in the case of most RPGs – or they may become evident to the player ecologically, by witnessing the character interact with the gameworld and drawing conclusions. In the fighting game *Soul Calibur* (Project Soul 1999), for example, the player can note that Taki moves around the arena much faster than Astaroth: thus, while the underlying statistical values that define each character as a game component remain at the level of the unseen game system, simple observation of the game in progress is enough to reveal the presence of these values.

Unlike the other categories of ludic elements, attributes only have the possibility of serving as meaningful CSs if they can be compared to those of at least one other (player or non-player) character: their significance is relative rather than absolute. The player might realize

she has been playing a character with a particularly high strength value only when she switches to playing a character with a much lower value for this particular attribute, which provides her with a point of comparison she would not have had otherwise. A character's slow movement might simply be a function of the given game's general slow-paced nature: it can only become the basis for a meaningful CS ("This is someone who moves slowly") if a character who moves around the world faster makes the first character's sluggishness significant by contrast. While Taki's speed is a meaningful CS when contrasted with Astaroth's relatively unwieldy movement, it makes little sense to compare Taki's movement to that of Chun-Li in *Street Fighter IV* (Capcom, 2009), since the attributes of the respective characters address entirely different game systems.

There are significant exceptions to this general rule: visible statistical attributes might provide the basis for an internal comparison between an individual character's strengths and weaknesses. Imagine the situation of encountering an RPG player-character about which nothing is known except that he possesses a Strength value of 18 and an Intelligence value of 6; or, conversely, a player-character with the reverse of those values. Even without knowing how these values compare to those of other characters in the game, a player with even a passing knowledge of the conventions of the genre will have no trouble finding ready stereotypes to draw on in order to flesh out this basic level of information into an image of a possible individual. Based only on this information, the player might guess that the first character belongs to some form of melee-combat-focused warrior class, such as a barbarian, while the second would be likely to be a magic user, possibly a wizard. Given that each of these stereotypes brings with it a whole range of assumptions regarding, for instance, the physical appearance, dress, habits and behavior of the individual in question, the power of attributes as a vehicle for CSs becomes particularly evident.

The second exception by which statistical attributes might become meaningful CSs even with no other characters present upon which to base a comparison is in the situation where a character development

system – a point I shall examine below – allows the player-character’s set of attributes to change over time. As such, the present configuration of the player-character’s statistical attributes might gain significance in contrast to an earlier configuration, or to possible choices along the branching tree of character-development options that were not selected.

Katie in *Gone Home* has no visible attributes, and, with no other characters present in the game, no points of comparison are available by which her attributes might be brought into relief: as such, no CSs can be identified for Katie in this category. In *The Last of Us*, meanwhile, Joel is defined through a number of attributes: maximum health, listen mode distance, crafting and healing speed and weapon sway, as well as mastery of the various categories of weapons available to use in the game.

DYNAMIC MIMETIC ELEMENTS

In Margolin’s model, CSs addressing dynamic mimetic elements are those which refer to “verbal, mental or physical acts” performed by that character (1986, 206): actions serve as indexical signs for particular traits in the individual personality by which they are produced. Margolin argues that this is true not only of physical acts, but also of verbal acts – referring not just to the linguistic content of a character’s speech, or even to paralinguistic elements such as tone of voice, but, rather, subsuming both to an understanding similar to John Searle’s speech-act theory (1969). If we are also made privy to the character’s inner life, then purely mental acts (what a character thinks, decides, plans, wonders, etc.) can also constitute meaningful CSs.

In relation to the characterization of the player-character, it is necessary to make a distinction between two sub-categories of CSs addressing dynamic mimetic elements. We shall term these sub-categories *character actions* and *player actions*.

Character actions

This constitutes the less conceptually problematic of the two sub-categories of dynamic mimetic elements. In most games, there is a set of actions performed by the player-character without any input from the player. This might include, for instance, actions the player sees the character perform when she is, to use Newman's terminology, "off-line", not actually playing: for instance, during a cutscene, or in the form of an idle animation that is triggered if a certain amount of time elapses without player input – Sonic's impatient foot-tap in *Sonic the Hedgehog* (Sonic Team, 1991) is a particularly iconic example of the latter. The verbal acts that constitute a character's voice-over – such as Garrett's vocal interjections in *Thief* – would also be considered under this category. This can also include actions taken by the character during play – that is, to use Newman's term, during the player's "in-line" engagement (2002); while exceptional, cases exist where the player-character refuses to follow the player's input, perhaps performing a different action of their own accord. Guybrush Threepwood in *The Curse of Monkey Island* (Lucasarts, 1997) is representative of this. Such actions are unequivocally to be attributed to the character rather than the player, and, as such, can easily be taken as strong CSs whenever they occur.

With no cut-scenes or other form of off-line sequence, the instances in *Gone Home* in which Katie performs an action of her own accord are few – in fact, precisely six in total – but revealing. Mostly, these fall under the category of mental acts, representing Katie's thoughts on the situation at hand by means of short text interjections on-screen. One of the first objects found in the course of the game, concealed in a trunk on the porch, is a duck-shaped festive ornament. When the player picks it up, we read Katie's thought on the matter, which is simply, "Good ol' Christmas duck" – a throwaway statement that reveals Katie's nostalgic relief at returning home after her time away.

The remaining character actions build a clear, linked pattern. When searching her father's library, the player-as-Katie finds pornographic magazines hidden in a box beneath copies of his novel. Here, Katie's

thought, marked with, we might imagine, embarrassment or disapproval, is, “Gosh, dad.” The situation is repeated, to cumulative, even comic, effect, when a *risqué* magazine is found hidden at the bottom of the wardrobe in Sam’s room (“Gosh, Sam”). Later, if the player decides to look through the drawers in Katie’s parents’ bedroom, a condom is discovered in the underwear drawer (“Gross”) and a self-help guide to improving one’s married sex life is found in the ensuite bathroom (“Ugh”).

Already a pattern is established that defines a distinct character trait, albeit one that the player might construct in various ways: as a sign of Katie’s discomfort about sexuality, for instance, or, more specifically, as embarrassment at discovering her family’s intimate secrets. The most noteworthy character action on Katie’s part, however, is the final one, occurring when a torn-out page from Sam’s diary is found crumpled up in a waste paper basket. When the page is picked up, it is, as usual, displayed on-screen; however, the player is barely given enough time to skim the first few sentences, and get an idea of the subject of the page – in which Sam describes her erotic feelings towards Lonnie as their relationship grows more intense – before the page is automatically closed, with Katie commenting, “Okay, that’s enough of that.” If the player tries to “use” the note again to continue reading, Katie flat out refuses to do so, giving only the comment: “I...no.”

Where *Gone Home* is minimal in terms of character action, *The Last of Us* is maximal. Thanks to a wealth of cut scenes, as well as to Joel’s numerous pre-scripted in-line conversations with Ellie and other NPCs, many of the actions that prove most crucial to Joel’s characterization are character actions that are not the result of player input. As a result of this, there are far too many individual character actions for us to present an action-by-action analysis on a similar level of granularity for the game as a whole. Instead, to provide an illustrative example, we can focus on a sequence of crucial character actions which occur in the game’s closing moments.

Rather than allowing Ellie to be killed in a medical experiment to

extract the source of her immunity, Joel violently infiltrates the headquarters of the Fireflies organization in order to rescue her, finally killing Marlene, the leader of the Fireflies, in cold blood to prevent her from ever attempting to track them down. Subsequently, he lies to Ellie about these events, leading her to believe the Fireflies let her go because there was no way of using her immunity as the basis for a vaccine. This sequence consists of a number of distinct acts which are crucial to the determination of Joel's character:

i) Joel decides saving Ellie's life is more important than a chance to obtain a cure for the fungal epidemic that is driving humanity to extinction.

This mental act can be read as the final indication of his fatherly devotion to Ellie – a devotion which can be linked to the loss of his own daughter in the first days of the plague. Less positively, it can be read as the sign of his obsessive need to atone for his perceived failure to protect his own daughter, being willing to potentially put the entire future of humanity at risk in order to fulfill his own emotional need to care for Ellie.

ii) Joel shoots Marlene.

This physical act, while, superficially, no different from the many murders Joel has committed during the course of the game in order to survive himself and to protect Ellie, bears a pronounced dramatic effect. Through Marlene's own characterization, she has been framed as level-headed, sympathetic, and idealistic; we learn that her decision to allow Ellie to be operated on was agonized over, leaving her wracked with guilt and self-doubt. In her confrontation with Joel, she is determined, but reasonable, conciliatory, and non-violent. Moreover, as the leader of the Fireflies, Marlene appears to embody one of the main hopes for the establishment of an alternative post-epidemic social arrangement to the military's totalitarian rule. Joel's decision to kill Marlene in cold blood when he realizes he cannot sway her therefore serves to reinforce the traits of obsession and ruthlessness that have already been suggested.

iii) *Joel lies to Ellie about what happened.*

This verbal act can be interpreted as a final instance of Joel's paternal attitude towards Ellie, shielding her from the guilt and self-doubt she might feel if she knew the truth. On the other hand, we might just as validly read this final action – with which the game ends – as a means for Joel to avoid confrontation with Ellie and to keep her enmeshed to him in a paternal relationship on which he has become emotionally dependent.

Player actions

In the vast majority of games, however, those acts we have defined as character actions constitute no more than a very small sub-set of the complete set of actions we can attribute to the player-character. Much more numerous are those we are terming *player actions*, being dependent on player input and, as such, unlike character actions, being perceived by the player as being her own as much as they are the character's. The fact that this category of dynamic mimetic elements – which corresponds to what Schröter and Thon termed “ludic events” in distinction to the scripted events of the predetermined narrative (2014) – is labeled “player actions” is not in any way meant to insinuate that these actions are to be considered less relevant to characterization. It is only meant to differentiate these actions from those character actions which are performed independently of the player. As Rehak (2003, 107), Ryan (2006, 190) and Westecott (2009, 1) point out, games re-present to the player a mediation of the game actions she herself performs; as such, player actions themselves become signs in the semiotic structure of the game, and, in the process of characterization, are weighed just as much as character actions: “as the player controls the character, the actions the player takes in the game also define what the character is like” (Lankoski, Heliö and Ekman 2003, 3).

There is clearly a link between the sequence of actions performed by the player in the course of playing a game, and the set of affordances linked to the figure as a game component, which we have already

discussed as, in itself, a potential avenue for CSs. The former, we can say, is an actualization of the latter: out of the set of affordances available to her, the player, in the act of playing, actualizes a particular sequence of actions. Even if there is some room for the player to choose which actions to perform and which to avoid, she is always inescapably enacting one out of a limited set of actualizations of a given player-character. Here, it might be useful to recall Murray's prescription that "participation in an immersive environment has to be carefully structured and contained," in the sense that "the range of allowable behaviors should seem dramatically appropriate to the fictional world" (1997, 106).

Katie, as befits someone in the role of an investigator unearthing an embedded narrative (Vella 2011), is primarily receptive – she searches, she reads, she moves from room to room trying to piece clues together. It could be argued this further emphasizes the sense of estrangement and alienation she feels towards her family after her time away, and her desire to reconnect with their lives. Meanwhile, the player's actions as Joel – with play following a pattern of exploration of a sequence of environments in search of supplies, alternating with encounters with enemies that can be approached with stealth or with brute force – again play into the set of character traits we have identified: his methodical, structured awareness of the situation, his ruthless efficiency and his level-headed approach to dangerous situations are all enacted in play. Furthermore, in the player's constant need to be aware of Ellie's location and status during combat – initially in order to ensure her safety, but, as the game progresses, also, increasingly, as a tactical ally – we can read both an underlining of Joel's protective, paternalistic attitude towards Ellie, and also the gradual (but never complete) shift in his attitude towards her as he begins to trust her with more responsibility.

FORMAL TEXTUAL PATTERNS

This is the most vaguely defined category in Margolin's taxonomy, covering "grouping of [narrative agents]; the analogies, parallels or contrasts between them created by such groupings; repetitions or

gradations, and various stylistic features associated with their introduction or occurrence” (1986, 206). Here, we shift focus: from looking at *what* about a character is represented, here we look at *how* it is represented, paying attention to formal techniques and the deployment of aesthetic, generic and medial codes.

A couple of examples of the kind of formal techniques which might be included in this category might suffice as an illustration. We might consider, for instance, the extent to which Katie’s characterization is driven by a sustained contrast between her and Sam. This is most evident in the juxtaposition of their images in the family portrait: aspects of Katie’s appearance which appeared neutral or unremarkable in isolation gain semiotic relevance through contrast with Sam. Katie’s stylistically conservative black dress stands in contrast to Sam’s flannel shirt, which aligns the younger sibling with the grunge and riot grrrl subcultures. Sam’s androgynous outfit also serves to make the relative femininity of Katie’s dress semiotically relevant. Moreover, other explicit parallels are made throughout the game. At different points, the player finds copies of the same homework assignment – a biology exercise in which sentences have to be placed in the right order to give an account of the female reproductive cycle – filled in by both sisters. Katie’s assignment is filled in correctly; Sam’s incorporates the sentences into a Second World War narrative in which the protagonist’s fiancé is killed in a bombing raid, paralleling the protagonist’s grief and subsequent resilience to the biological process of menstruation and ovulation. The CS that is implied in the contrast between the two assignments – Katie as straight-laced, Sam as artistic and rebellious – is obvious.

In the opening scene of *The Last of Us*, a common formal technique for introducing the player-character is exemplified in a particularly striking fashion. Initially, the player is given control of Sarah, Joel’s young daughter: as such, the player’s initial experience of Joel is an external one. This prologue plays a vital role in Joel’s characterization – not only because Sarah’s death at the end of the sequence allows us to consider long-gestating sentiments such as grief and guilt as being central to Joel’s character, but also because it presents Joel to

the player in the mode in which, once the player takes control of him, he will adopt towards Ellie: paternal, protective, level-headed, resourceful. In essence, before the player picks up Joel's controls, he has already been established as a character through being framed from an external perspective – an effect similar, if more pronounced, to that which is often achieved in games through an intro cutscene.

THE 'PLAYER' IN 'PLAYER-CHARACTER'

By their very nature, characters are never available to us as figures whose outlines are completely shaded in – as Price notes, “fictional characters are only partially specified” (1983, 57). Having completed both games and seen the processes of characterization and character building through to the end, there remains much we do not know about Joel and Katie. This applies not only to background biographical detail – say, where Joel was born, or what Katie's favorite food is – but also to aspects of the respective characters that are crucial to the events occurring in the course of the game. It is never specified, for instance, whether Katie, in piecing together the details of Sam and Lonnie's relationship, shares their parents' disapproval of the same-sex relationship, or whether she holds a more open-minded attitude on the issue.

To a great extent, of course, this is due to the inevitable fact that characters are, by their very nature, “ontologically ‘thin’ and not maximal, having only a limited number of properties and relations” (Margolin 1990, 847). However, there is an additional factor at play here. Though it has been the focus of this paper to arrive at a semiotic-structural model that addresses the player-character as a composite of textual signs in all the various medialities offered by a digital game, the question of the role of the player in this process needs to be acknowledged. After all, it is on the crucial point that a character does not exist as a fully defined semiotic entity until actualized by player input that the ontological nature of the player-character is set apart from other formulations of character.

Both as an indication of how the model we have proposed can fit

into a more complete understanding of the player-character, and as a signpost towards future directions for theorizing the player-character, we shall briefly consider two important insights that result from a fuller consideration of the role of the player. Firstly, the player always has some degree of input, no matter how minimal, in the shaping of the set of CSs that constitute a player-character's textual substrate. Depending on a particular player's actions, different playthroughs might produce very different sets of player action CSs, and, hence, different characterizations. A player of *The Last of Us* might favor Joel's affordances for stealth and spatial awareness, patiently assessing every situation and avoiding confrontation and violence where possible. Another player might instead make a point of eliminating every hostile individual encountered. The available affordances allow for both styles of play, but the Joel that results from the first playthrough is, in an important way, different from the Joel that results from the second, even with all the other CSs that go into his constitution remaining unchanged.

This renders the player-character, as a semiotic construct, incomplete in an entirely different sense to the incompleteness of character identified by literary theorists like Margolin, Price or Alan Palmer, who writes that a character only exists as a character once the reader "collects together all of the isolated references to a specific proper name in a particular text and constructs a consciousness that continues in the spaces between the various mentions of that character" (2004, 176). This difference is predicated on the ergodic nature of game textuality (Aarseth 1997): since the user function of the player, unlike that of the novel reader or the film viewer, is configurative rather than purely receptive, the complete set of CSs that constitute a player-character's textual substrate is not present and accounted for from the start – as it would be for a character in a novel or a film – but is only fully determined once the player's selections and ludic actions have traced out a path of traversal through the network of possibilities offered by the game.

This suggests a modification to our understanding of the constitution of the player-character, framing it as containing both a set of fixed

CSs (the complete set of static mimetic elements, as well as those character actions which are pre-scripted) and a mechanism for the generation of further CSs that, during the course of a given playthrough, come together into a unified set of CSs which, together, are interpreted by the player in the form of a possible non-actual individual. The implication of this is that, if two players both play *The Last of Us*, two different sets of CSs will be produced, sharing many of their elements, but, crucially, not all, given that the sets include within them different respective sequences of player actions. Let us say that the first set of CSs, produced from the first playthrough, results in an image of a character we can call Joel1. Meanwhile, the second set of CSs, produced from the second playthrough, results in an image of a character we can call Joel2.

In other words, when speaking of a player-character as a possible non-actual individual, we are speaking specifically of the character as actualized in one given playthrough: before this actualization, there is no character to speak of, only the framework for one. Of course, this framework will, to a varying, but, in most cases, considerable degree, impose narrow limits upon the range of possible actualizations of the player-character. It is for this reason that it remains possible, as has been done throughout the articulation of this model, to continue to speak of the player-character as a fixed constant across its various possible actualizations in the complete set of possible playthroughs of a game. In any successful playing of *Gone Home*, Katie's careful, investigative quality is going to emerge, as is Joel's stoic determination in any playing of *The Last of Us*. Saying that the player-character is entirely determined in the player's actualization, then, is as reductive as considering it a fixed, predetermined construct: any understanding of the player-character must take both of these aspects into account in conceptualizing it as an entity. This is the point Schrö and Thon suggest when arguing that "even though the game constructs the frame within which the gameplay will be realized [...] ludic events are not determined before the game is played" (2014).

The second observation to make in the relation of character to player

concerns the question of mental acts. We have already observed a number of ways in which the mental acts of a player-character can be communicated to the player – for instance, through formal techniques such as the interior monologues utilized in games such as *Thief* or *No More Heroes* (Grasshopper Manufacture 2008), or through the way in which physical or verbal actions can serve as indications of mental acts, as in the case of Joel’s decision regarding Ellie’s future. However, if mental actions are perhaps the purest indication of the irreducible, individual interiority that constitutes the essence of a character – the “precious remainder” that Barthes identifies (1974, 190) once the simple accumulation of textual signs have all been taken into account, and which, as Ryan (2006, 8) and Eder (2010, 17) – then we need to keep in mind that the figure in question is one in which two such individual interiorities meet: that of the character and that of the player.

The intersection between the two in the same figure is a theme that requires more involved attention than it can be given here. For our current purposes, however, it is pertinent to consider to what extent we can speak of the player’s own phenomenal experiences of the gameworld as being attributable, through a representative relation, to the player-character. In this sense – though a simple one-to-one attribution of the player’s mental acts to the character is out of the question – we would need to adapt the structural-semiotic model of the player-character to include, say, the player’s fear when hiding from a clicker in *The Last of Us*, or her shock and concern for Sam when noticing what appear to be bloodstains in the bath in *Gone Home* – considering these as being relevant not just as first-hand phenomenal experiences on the part of the player, but also, at the same time, as representative signs for equivalent mental acts on the part of the character.

CONCLUSION

It has been the intention of this paper to address the lack of a solid conceptual foundation for the notion of a “character” as it is used in the term “player-character”, thereby filling a gap in the game studies

discourse. In summary, the understanding of the player-character *as* a character that this paper proposes involves two primary insights. First, we highlighted the dual ontology of the character, as both a possible non-actual individual and as an accumulation of semiotic cues from which this individual emerges as an abstract construct. Secondly, a structural-semiotic model was proposed in order to trace the various medialities operating in unison to deliver these cues.

This paper should not be taken as proposing a privileging of the discourse of the player-character over the discourse of the avatar, or to suggest that thinking of the player-character covers everything we need to know about the relation between the player and the figure under her control. In fact, our concluding insight is that this semiotic structure cannot be considered in isolation, and that the player-character as a semiotic totality is only available once it is actualized by the player. The next theoretical step, then, would be to incorporate the notion of character back into the wider discourses of the playable figure, from which we extracted it at the start. Having now been more rigorously defined, and carrying with it the ontological and semiotic implications we have mapped out, this understanding of character can now be of service in game studies' tackling of the complexities – ontological, phenomenological, narrative and otherwise – of the playable figure.

REFERENCES

Aarseth, E. *Cybertext*. Baltimore: Johns Hopkins University Press, 1997.

Aarseth, E. "Doors and Perceptions: Fiction vs. Simulation in Games". In *Intermedialities*, 9, 35-44. 2007.

Aarseth, E. "A Narrative Theory of Games." In *Proceedings: Foundations of Digital Games 2012*, Raleigh, NC, USA, May 29 – June 1, 2012.

Barthes, R. *S/Z*, trans. R. Miller. New York: Hill and Wang, 1974.

Bayliss, P. "Beings-in-the-Gameworld: Characters, Avatars and Players." In Proceedings of the Fourth Australasian Conference on Interactive Entertainment: IE2007, Australasian Conference on Interactive Entertainment, Melbourne, Australia, 2007.

Bethesda Game Studios. *The Elder Scrolls V: Skyrim* [PC]. Bethesda Softworks, 2011.

Bioware. *Mass Effect* [PC]. Electronic Arts, 2007.

Bioware. *Star Wars: The Old Republic* [PC]. Electronic Arts, 2010.

Capcom *Street Fighter IV* [Arcade]. Self-released, 2008.

Chatman, S. *Story and Discourse: Narrative Structure in Fiction and Film*. Ithaca, NY: Cornell University Press, 1980.

Crytek. *Crysis* [PC]. Electronic Arts. 2007.

Eder, J. "Understanding Characters." In *Projections* 4, no. 1, pp. 16-40. 2010.

Eder, J., Jannids, F. and Scheider, "Characters in Fictional Worlds: An Introduction". In *Characters in Fictional Worlds*, edited Eder et al., pp. 3-66. Berlin and New York: De Gruyter, 2010.

Eidos Montreal. *Deus Ex: Human Revolution* [PC]. Eidos. 2011.

Fernández-Vara, C. "The Paradox Between Player Control and Player Character in Adventure Games". Presented at the annual meeting of the International Communication Association (Boston, MA Online, May 25, 2011)

Forster, E.M. *Aspects of the Novel*. San Diego, CA: Harcourt Brace, 1995.

Frasca, G. "Rethinking Agency and Immersion: Videogames as a Means of Consciousness-Raising". Paper presented at the ACM SIGGRAPH 2001, Los Angeles, US, 12-17 August 2001. Available

at <http://www.siggraph.org/artdesign/gallery/S01/essays/0378.pdf>
(accessed May 14, 2014).

The Fullbright Company. *Gone Home* [PC]. Self-released, 2013.

Gee, J.P. "Video Games and Embodiment." *Games and Culture* 3, no. 3-4, pp.253-263, 2008.

Genette, G. *Narrative Discourse*, translated by J. E. Lewin. Ithaca, NY: Cornell University Press, 1980.

Grasshopper Manufacture. *No More Heroes* [Nintendo Wii]. Rising Star Games, 2008.

Heidbrink, H. "Fictional Characters in Literary and Media Studies: A Survey of the Research." In *Characters in Fictional Worlds*, pp. 67-110. 2010.

James, H. "The Art of Fiction." In *The Future of the Novel*, edited by L. Edel, pp. 3-27. New York: Vintage, 1956[1884].

Järvinen, A. *Games without Frontiers: Theories and Methods for Game Studies and Design*. Doctoral Thesis. Acta Electronica Universitatis Tamperensis 701 Media Culture. University of Tampere, 2008.

Jørgensen, K. "'I'm Overburdened!': An Empirical Study of the Player, the Avatar, and the Gameworld" in *Proceedings from DiGRA 2009: Breaking New Ground: Innovation in Games, Play, Practice and Theory*. Brunel University, London, September 1-4, 2009.

Jørgensen, K. "Game Characters as Narrative Devices", in *Eludamos: Journal for Computer Game Culture* 4, no. 2 pp. 315-331. 2010.

Klastrup, L., & Tosca, S.P. "'Because it just looks cool!' Fashion as Character Performance: The Case of WoW", in *Journal of Virtual Worlds Research* 1, no. 3, pp. 4-17. 2009.

Klevjer, R. *What is the Avatar: Fiction and Embodiment in Avatar-based Singleplayer Computer Games*. Doctoral thesis: University of Bergen, 2006.

Klevjer, R. "Enter the Avatar: The Phenomenology of Prosthetic Telepresence in Computer Games", in J.R. Sageng et al. (eds.), *The Philosophy of Computer Games*, Philosophy of Engineering and Technology 7, pp. 17-38. New York: Springer, 2012.

Lankoski, P., Heliö, S., & Ekman, I. "Characters in Computer Games: Toward Understanding Interpretation and Design." In *Level Up: Digital Games Research Conference 2003 Conference Proceedings*, edited by M. Copier and J. Raessens. Utrecht: Universiteit Utrecht, 4-6 November 2003.

Lankoski, P. "Player Character Engagement in Computer Games", in *Games and Culture* 6, no. 4, pp. 291-391. 2011.

Linderoth, J. "Animated Game Pieces: Avatars as Roles, Tools and Props", in Proceedings of the Aesthetics of Play Conference, Bergen, 14-15 October 2005.

Looking Glass Studios. *Thief: The Dark Project* [PC]. Eidos Interactive, 1998.

LucasArts . *Full Throttle* [PC]. Self-released, 1995.

LucasArts. *The Curse of Monkey Island* [PC]. Self-released, 1997.

Margolin, U. "The Doer and the Deed: Action as a Basis for Characterization in Narrative". In *Poetics Today* 7, no. 2, pp.205-225. 1986.

Margolin, U. "Individuals in Narrative Worlds: An Ontological Perspective." In *Poetics Today* 11, no. 4, pp.843-871, 1990.

Montfort, N. "Fretting the Player Character." In *Second-*

Person, edited by P. Harrigan and N. Wardrip-Fruin, pp. 139-146. Cambridge, MA: MIT Press.

Mukherjee, S. "Vishnu and the Videogame", in Proceedings of the 6th International Philosophy of Computer Games Conference, Madrid, January 29-31 2012.

Murray, J.H. *Hamlet on the Holodeck*. Cambridge, MA: MIT Press, 1997.

Naughty Dog *Uncharted: Drake's Fortune* [Playstation 3]. Sony Computer Entertainment, 2007.

Naughty Dog. *The Last of Us* [Playstation 3]. Sony Computer Entertainment, 2013.

Newman, J. "The Myth of the Ergodic Videogame." In *Game Studies* 1, no.2, 2002. Available at <http://gamestudies.org/0102/newman/> (accessed Feb. 2014)

Nintendo. *Super Mario 64* [Nintendo 64]. Self-released, 1996.

Nintendo. *The Legend of Zelda: The Ocarina of Time* [Nintendo 64]. Self-released, 1998.

Palmer, A. *Fictional Minds*. Lincoln and London: University of Nebraska Press, 2004.

Perfect Entertainment. *Discworld Noir* [PC]. GT Interactive, 1999.

Phelan, J. *Reading People, Reading Plots: Character, Progression and the Interpretation of Narrative*. Chicago, IL: Chicago University Press, 1989.

Price, M. *Forms of Life*. New Haven and London: Yale University Press, 1983.

Project Soul. *Soul Calibur* [Arcade]. Namco, 1998.

Quantic Dream. *Heavy Rain* [Playstation 3]. Sony Computer Entertainment, 2010.

Quantic Dream. *Beyond: Two Souls* [Playstation 3]. Sony Computer Entertainment, 2013.

Rehak, B. "Playing at Being: Psychoanalysis and the Avatar." In *The Video Game Theory Reader*, edited by M.J.P. Wolf and B.Perron, pp. 103-127. London: Routledge, 2003.

Rimmon-Kenan, S. *Narrative Fiction*. London: Routledge, 1983.

Ryan, M.L. *Avatars of Story*. Minneapolis, MN: University of Minnesota Press, 2006.

Schröter, F., and Thon, J.N. "Video Game Characters: Theory and Analysis." In *Diegesis* 3, no. 1, 2014.

Searle, J. *Speech Acts*. Cambridge: Cambridge University Press, 1969.

Sonic Team. *Sonic the Hedgehog* [Mega Drive]. Sega, 1991.

Team Ninja. *Dead or Alive 3* [Xbox]. Tecmo, 2001.

Ubisoft Montpellier. *Beyond Good & Evil* [Playstation 2]. Ubisoft, 2003.

Ubisoft Montreal. *Deus Ex: Human Revolution* [PC]. Ubisoft, 2010.

Valve. *Half-Life* [PC]. Sierra Entertainment, 1998.

Valve. *Half-Life 2* [PC]. Electronic Arts, 2004.

Vella, D. "Spatialised Memory: The Gameworld As Embedded Narrative." In *Proceedings of the Philosophy of Computer Games Conference 2011*, Athens, Greece, April 6-9 2011.

Vella, D. "It's A-Me/Mario: Playing as a Ludic Character." In

Proceedings of the Foundations of Digital Games Conference 2013, Chania, Greece, May 14-17 2013.

Vella, D. "Player and Figure: An Analysis of a Scene in *Kentucky Route Zero*," in *Proceedings of the Nordic DiGRA Conference 2014*, Visby, Sweden, May 29 2014.

Waggoner, Z. *My Avatar, My Self*. Jefferson, NC: McFarland, 2009.

Westecott, E. "The Player Character as Performing Object", in *Proceedings from DiGRA 2009: Breaking New Ground: Innovations in Games, Play, Practice and Theory*. Brunel University, London, September 1-4, 2009. Available at <http://www.digra.org/wp-content/uploads/digital-library/09287.43252.pdf> (accessed Feb. 2014)

Yager Development. *Spec Ops: The Line* [PC]. 2K Games, 2012.

What is Strafe Jumping?

idTech3 and the Game Engine as Software Platform
Dylan Lederle-Ensign & Noah Wardrip-Fruin

INTRODUCTION

Strafe jumping is a technique by which players can break the “speed limit” of games built on the Quake family of engines, and achieve up to double the normal movement speed. It exploits a bug deep in the physics engine, where the player’s ground friction is calculated, to minimize this friction and speed up the player’s movement through successive jumps. This speedup drastically increases the pace of gameplay and contributes to the sense that *Quake III Arena* (id Software, 1999) is a twitch shooter which rewards quick reflexes (Juil, 2005). Although it was possible to fix the glitch, the player community intervened to preserve it. It is a strange example, in which a glitch enters into the game design space, and is eventually adopted by the player community (followed by some designers and developers) as a key game mechanic.

This paper argues that a full account of strafe jumping requires an understanding of the context in which it emerged, both socially and technically. The distinct features of software platforms, specifically the game engine, must be taken into consideration. This paper characterizes game engines as software platforms, and uses this to conduct a brief platform study of idTech3, the engine underneath *Quake III Arena*. This study includes a code reading of the function that enables strafe jumping, and references John Carmack’s extensive development notes to provide social and historical context. We consider the significance of strafe jumping to the player community’s play experience, profiling the DeFrag movement mod. Finally, we

consider the lessons this study can provide to future work on software platforms and game engines.

WHAT IS STRAFE JUMPING?

Strafe jumping is an exploitable bug. Just because people have practiced hard to allow themselves to take advantage of it does not justify its existence (*sic*).

— John Carmack, .plan June 3, 1999[1]

The precise technique for strafe jumping is difficult to describe, but in essence the player coordinates pressing the directional keys while jumping and moving the mouse to specific vectors. These vectors are miscalculated by the engine, and the normal friction which slows a player down after landing on the ground is not applied. By repeating this process, a player can accelerate to very high velocities and navigate around a level environment in new ways, bridging gaps which were previously impassable.

Strafe jumping, and associated movement techniques like circle jumping, were originally enabled by bugs dating from the first *Quake* (id Software, 1996). The player community mastered their use and incorporated them into the metagame. By the release of *Quake III Arena* three years later, official maps were being designed to specifically incorporate high skill “jumps,” which allow shortcuts through a level, but require practice to hit the correct vectors every time.

Our first question, in this paper, is: Within the context of game studies, how should we think of strafe jumping? With our current historical and interpretive frameworks, what is it, and where did it come from? Unfortunately, this question can be difficult to answer.

For example, strafe jumping might be thought of as an element specific to particular id Software implementations of the common operational logics of physics and navigation. Mateas and Wardrip-Fruin define operational logics as a “representational strategy, supported by abstract processes or lower-level logics, for specifying

the behaviors a system must exhibit in order to be understood as representing a specified domain to a specified audience” (2009). However, to be seen as representational strategies, operational logics must be positioned as *authored*, and strafe jumping was not authored. Instead, it emerged from the interactions of the complex system underlying *Quake III Arena*. This is in some ways similar to another well-known emergent property from *Quake*, rocket jumping. Rocket jumping is another movement phenomenon, but unlike strafe jumping it emerged from an unexpected combination of explicitly authored rules (in particular the properties of the weapon). In the case of strafe jumping, the framework of operational logics must be revised or set aside to understand the phenomenon.

From a different perspective, Juul includes the laws of physics in the rules of physical sports, arguing that *FIFA 2002* “requires that the laws of physics ... be explicitly implemented in the programming *on the same level as the explicit rules of the game*” (2005, original emphasis). This is necessary for *FIFA* to accurately simulate a real game of soccer, and Juul argues that “therefore it makes sense to see the laws of physics on the same level as the conventional rules in soccer” (*ibid*). However, while real world physics influence the dynamics of soccer, viewing them as another system underlying all physical sports is clearer than characterizing them as rules. Physics is the “platform” on which the rules of sports are designed, and play in virtual worlds is shaped by the ways that their platforms implement and tune physics.[2] We could attempt to position this implementation and tuning as a set of rules, but this again implies authorship, or at least enumeration, and strafe jumping is neither an authored rule nor explicitly encoded anywhere in the software. It arguably isn’t even an “emergent phenomenon” from the interactions of the rules, but a difficult-to-correct bug (given the way the platform’s physics rules were encoded). Placing it on the same level as rocket jumping disregards the differences between the unintentional results of authored rules and the accidental nature of this glitch.

Alternately, we could turn to another popular approach in game studies and attempt to position strafe jumping as an example of game

rules and behavior being socially negotiated. But strafe jumping is precisely the result of the characteristics of a technical artifact. Its uses are of course socially negotiated, but we cannot use such a framework to understand its origins or examine its nature.

In short, strafe jumping is difficult to account for with current approaches to game studies. To understand where strafe jumping comes from and how it functions requires investigations at the platform level. To understand strafe jumping's importance and staying power requires an understanding of play phenomena, game design practice, and the influence of player communities — all in the context of game platforms. The primary platform for *Quake III Arena* is its engine, known as idTech3. The rest of this paper will develop a theory of software platforms, in an attempt to fully understand strafe jumping. Taking the game engine as a platform, it will explore the relationship between engines, genres, and their communities.

SOFTWARE PLATFORMS

Platform studies is an emerging field, but as Dale Leorke pointed out in a review of the eponymous MIT Press book series (2012), it is already verging towards a predictable formula: “One can imagine an endless production line of books—one on the Magnavox Odyssey or Sega Dreamcast, another on Java or Microsoft DOS—that are valuable in themselves, but which don't expand on the established formula of the series.” While Leorke's statement suggests a relatively even balance between hardware and software platforms, in fact all the published books in the series (and, to the best of our knowledge, all but one of the forthcoming books) focus on hardware platforms. This paper instead is an initial look at a software platform — and examines some aspects of software platforms, particularly game engines, which have not yet received critical attention. The study of game engines provides insights into details of game genres, which are narrower and more specific than the constraints imposed by most hardware, as well as more malleable due to the flexibility of software. As might be expected in such an initial look, this paper identifies more issues than it seeks to resolve.

In Montfort and Bogost's diagram of the layers of digital media (2009), *platform* is at the bottom, followed by *code* above. Software platforms complicate this boundary, which is comparatively distinct and taken for granted when dealing with hardware. Software platforms are both made up of code to run on a variety of physical devices, as well as capable of executing code. This navigation through layers of abstraction is a strength of Montfort and Bogost's model, and studying software platforms helps us to understand the tangled, recursive relationships between code and platforms.

As this suggests, we see it as key that software platforms are less clearly defined than commercial game consoles and other hardware platforms. Just as the boundary between code and platform blends and becomes difficult to pin down, even the border between different platforms is fuzzy. As our below discussion of idTech3 will demonstrate with a proliferation of modified engines, software platforms can be used piecemeal by developers, and extended well beyond their original capacities in ways that hardware platforms rarely are. How much shared code is necessary to be considered the same platform? If two software platforms share an architecture, but have significantly differing implementations, how do we characterize this relationship? If code written for one software platform runs on another, are they different realizations of the same platform? These are questions that past studies of hardware platforms have not addressed.

Murray and Salter, in their study of Flash (Forthcoming) situate it within the tangled platform of the Web. Flash extends the native capabilities of Web browsers, and must co-exist with a multitude of technologies like CSS, HTML and JavaScript. Flash is clearly a platform of its own, with a full development suite and very different affordances from the native Web. However, its development and existence are also closely intertwined with the Web, as Murray and Salter explain in a chapter considering Flash's future in an HTML5 Web. Tangled, simultaneously existing platforms seem to be a characteristic of software platforms, one which deserves further study.

This is an incomplete characterization of software platforms. As noted above, it raises more questions than it answers. However, it gets us closer to an understanding of strafe jumping. This phenomenon is a property of its engine, which can be characterized as a specific type of software platform. Game engines are the key software platform for video games.

Game Engines as Platforms

Game engines are the infrastructural software and tools which allow developers to manage the vast complexity of modern games. They commonly provide physics simulations, networking, and graphical primitives as well as often handling portability across physical computing platforms. They are just as important for shaping the playable experience as the hardware itself, perhaps more so. Decisions made in the design and implementation of the engine clearly constrain the games made on them.[3]

Henry Lowood identifies *DOOM* (id Software, 1993) as the first game to use the term “game engine.” He associates the engine with development efficiency, and argues that in 1993 id imagined “the licensed game engine could become a platform upon which diverse games would be constructed” (Lowood, 2014).[4] He continues on to state that “the development of engine technology traces the growth and maturation of the game industry” (*ibid*). The efficiency enabled by game engines allowed the industry to develop games much more rapidly than before.

Game developers will license another company’s engine to build their game on, but the exact requirements for each game are different. Due to the flexibility of software, the underlying engine can in some cases be modified as necessary. While hardware modifications can be done by individuals, they are not typically done by commercial game studios. Instead, hardware platforms are extended with peripherals.[5] Though it is possible to modify the game engine, the challenge of understanding the internals of a system as large and complex as a modern 3D game engine makes it difficult to make the changes

developers desire. It is easier to treat the engine as a black box to interface with, and utilize the official tools provided for developers to achieve their goals.

Andrew Hutchinson has called working inside the technological limits provided by platforms the “pragmatic expression” of games (2008). Hutchinson writes that both *Doom* and *Myst* (Cyan, 1993) originally aimed for a similar immersive 3D style. However, due to the limited computational power available in 1993, both were forced to make compromises and engineering decisions that influenced the aesthetics of the games. Hutchinson explains that “*Myst* went the visual ‘high and slow’ road, and *Doom* went the ‘low and fast’ road” (2008). Despite their flexibility, software platforms are still constrained by the hardware platforms below them.

In “Untangling Twine” (2013), a paper about the hypertext story platform Twine, Jane Friedhoff argues that the documentation, community and discourse around the Twine platform make it uniquely suited to experimental playable media experiences that push at the boundaries of what games are. Friedhoff rightfully emphasizes that Twine’s profiling by independent game maker Anna Anthropy “likely shaped the initial crop of games created with the platform.” Friedhoff argues that both the free, web-based nature of Twine and its promotion by Anthropy make the platform appealing for marginalized people. She notes that the official documentation explicitly tries to appeal to writers rather than coders saying: “rather than answering ‘how would you make a game with this?’, the official Twine reference manual focuses on answering ‘why would you make a game at all?’” Friedhoff’s work emphasizes that documentation and community are key to a platform’s growth and the aesthetic that emerges around them.

Combining Hutchinson’s writing on the technical limitations that game engines address with Friedhoff’s about the community around them, we can start to see a clearer picture of the significance and influence of game engines as software platforms. Engines, like hardware platforms, have a particular set of affordances — which

make certain kinds of game creation comparatively easy for developers. They also generally have an ecosystem of tools for people contributing in different manners (e.g., as level designers, artists and coders) to interact with the engine in particular ways. These combine to align engines so closely to particular genres and styles of game that technical research into game engines has questioned whether engines can be separated from their genres (Anderson et al., 2008).

Game Engines and Game Genre

Game genre is notoriously messy and marketing defined (Aarseth, 2004). Game genres are usually defined by the dominant play activity, while genres in other media are typically defined by shared iconography (Wolf, 2001). To address this disconnect, David Clearwater proposes three aspects of genre categorization: formal/aesthetic, industrial/discursive context, and social meaning/cultural practice. While the industrial/discursive aspects are certainly influential in shaping game engines, this paper addresses formal dimensions of genre.

Game engines are made to support certain prototypical games. In the case of idTech3, this was *Quake III Arena*, but even engines which are not made for a single game have a particular type of game in mind. The support for these games takes the form of implemented features, which we will characterize as particular operational logics (Mateas and Wardrip-Fruin 2009). These easily usable logics make it straightforward for developers to make games similar to the prototypical game. However, because game engines are also modifiable and extensible, developers find other uses for these logics and ways to adjust them. This is one source of difficulty regarding genre. Two games may share many common formal elements, and perhaps substantial source code, but may have very different play dynamics because of extensions or modifications to the original engine.

This also leads to a major difference between a game engine and a more general purpose hardware platform like a game console.

Engines are closely aligned to particular prototypical games. This leads to the surprising characterization of the Atari VCS as a game engine implemented in hardware. As Bogost and Montfort (2009) detail extensively, the console was designed to support Pong. The necessary operational logics (most notably collision detection) were then appropriated to form the myriad other games published for the console.

Other authors have characterized video game genres as common interfaces (Douglass, 2007), but they can also be thought of as collections of common operational logics. Game engines are tightly tied to specific genres because they implement a large number of these shared operational logics (Wardrip-Fruin, 2009). Close study of the implementation choices for a particular logic is one way to learn more about it and how it functions across different games. This characterization of genre is not meant as a complete overhaul or recharacterization of existing genre literature. Engines are one way to clarify that messiness, operational logics are clear

Game Engines and Community

Game engines, like all platforms, have complex communities of users around them. The original developers, commercial licensees, amateur modders, and players all have a stake in the engine's success and direction. John Carmack, in his .plan from December 31 2004, discussed the delayed open sourcing of idTech3 due to a recent licensing agreement: "Previous source code releases were held up until the last commercial license of the technology shipped, but with the evolving nature of game engines today, it is a lot less clear. There are still bits of early Quake code in Half Life 2, and the remaining licensees of Q3 technology intend to continue their internal developments along similar lines, so there probably won't be nearly as sharp a cutoff as before." The original creator, Carmack, wanted to open source this technology to make it easier for modders and amateurs to create games using it. However, his company had commercial agreements with other studios. Releasing it for free would devalue their purchase of a license. The network of actors with

a stake in the future of idTech3 was complex, and Carmack wanted to serve as many competing interests as possible.

As Carmack mentions, some small pieces of Quake code survive, both in the current generation of idTech engines as well as those of their licensees, most notably Valve's Source engine (used in Half Life 2). The tangled nature of game engines makes drawing clear lines between them difficult, and perhaps pointless. It is easier and more descriptive to classify them into "families," such as the Quake family (of which Source could be a branch), the Unreal family, the Crysis family, and so forth. Each family has a distinct style and "feel." This shared sense of feel can be traced back to low level decisions in the physics or graphical simulations that form the engine.

Game designer and teacher Robert Yang noted on his blog the influence that the Source engine has had on his aesthetic: "When I'm trying to tune movement physics in other games, am I just trying to replicate the feel of Half-Life because that's what feels 'right' to me? (Unreal Engine games almost all universally feel 'chunky' to me, in comparison. I'm sure people who grow up using Unreal would disagree with me, and argue that Half-Life or Quake-lineage games are too loose.)" (Yang, 2013). This is one of the key reasons for studying game engines. More than any other single piece of software, they exert influence over the design of the games and genres that are built on them.

In short, we argue that understanding game engines as software platforms is useful for studying game genres, operational logics, and the games built on them. This characterization provides technical insight into the way specific logics work, and includes the social factors by which communities shape their platforms, but requires setting aside a strongly authorial view of all aspects of logics as intentionally representational. We follow this, in this paper's next section, with a short platform study of the idTech3 engine.

IDTECH3

The history of id Software has been told more widely and often than most video game developers'. It is an American success story, of the small independent creator striking it rich with a good idea and devoted work ethic. David Kushner tells this story in the popular history *Masters of Doom: How Two Guys Created an Empire and Transformed Pop Culture* (2003). Kushner's book is framed around "the two Johns," Carmack and Romero. Their creative chemistry and interpersonal drama leads to the rise and fall of id. This paper is not about their legacy, but about their technology, specifically the engine from *Quake III Arena*, idTech3.

Focus on Mod Programming in Quake III Arena (Holmes, 2002), a technical manual for aspiring game programmers, describes the influence of John Carmack as follows: "John Carmack, lead programmer at id Software, is the man responsible for creating the technology that drives all the latest and greatest games. Not only do his 3D engines power id Software's games, such as the *Quake* series, it also powers many other companies' games as well, thanks to licensing agreements." As seen in Figure 1 (Wikipedia user Tei, 2013) the *Quake* family of games and engines is expansive. While this diagram is from Wikipedia and has some problems (it does not distinguish clearly between mods, engines, and commercial games, and it does not indicate how closely related linked entities are) it does give a sense of the connections between the idTech engines and their descendents. It is also clear that after idTech3 there were significantly fewer licensees than the earlier games. Despite the numerous games built in the *Quake*-engine family, Carmack claims it was not their intent: "It's interesting when you look at our technology licensing — it was never really a business that I wanted to be in" (Graft, 2011). While idTech4 was licensed to a handful of outside studios, idTech5 is solely for id Software use. idTech3 was the last of the highly influential *Quake* engines.

According to a popular *Quake 3* source code review from Fabien Sanglard, "the engine is mostly an evolution of idTech2" (Sanglard,

2012). Building on the groundbreaking work that they did with the first Quake, id Software's engineering team, led by John Carmack, created a complex game engine that balanced the goals of speed, security and portability across physical computing platforms. Internally known as "Trinity", the engine introduced the Quake Virtual Machine (QVM), which Holmes' emphasis allowed for increased security for running mods. This was, in fact, one of Carmack's main goals, as noted in his .plan entry from November 3, 1998. The idTech2 architecture supported mods in the form of potentially dangerous .dlls. In order to continue supporting mods, Carmack went to the significant engineering effort of developing the QVM, running a subset of the C programming language, QuakeC. idTech3 also moved to fully hardware rendered graphics, and featured an improved network model (Lederle-Ensign, 2013).

idTech3 exemplifies the diversity and extensibility of software platforms. There are a number of engines that are direct descendents of idTech3, including ioquake3, Quake III w/ Uber tools, and qFusion. Uber tools were a set of proprietary extensions to the engine from Ritual Entertainment, used in *American McGee's Alice* (Rogue Entertainment, 2000), *Star Trek Elite Force II* (Ritual Entertainment, 2003), and several other games. The improvements seem to mostly be in scripting for single player experiences, an area that was not a concern for *Quake III Arena*. QFusion and ioquake3 are both open source forks of the engine. Ioquake maintains a modernized version of the engine, which supports a number of total conversion mods released as standalone games, such as *Urban Terror* (Silicon Ice, 2000) and *World of Padman* (Padworld Entertainment, 2007). QFusion was originally a port of idTech2, but now supports idTech3 data formats. It was mainly developed for the competitive arena shooter *Warsow* (Warsow Team, 2005).

The diversity of the idTech family of engines is a trait of software platforms. Software platforms are more flexible than hardware platforms, and are easily extended by third parties. This leads to a proliferation of slightly modified platforms, and adds challenges for

scholars studying them. Frequently software platforms are less stable objects and more groups of related concepts and software objects.

The history and technical details of the idTech3 platform provide context for strafe jumping. It came from a fast moving start-up studio, which iterated quickly on its technology. While a distinct platform in its own right, idTech3 cannot be understood in isolation from the engines that came before it, or those that followed. In the next section, the site where strafe jumping is encoded is traced through these different engines.

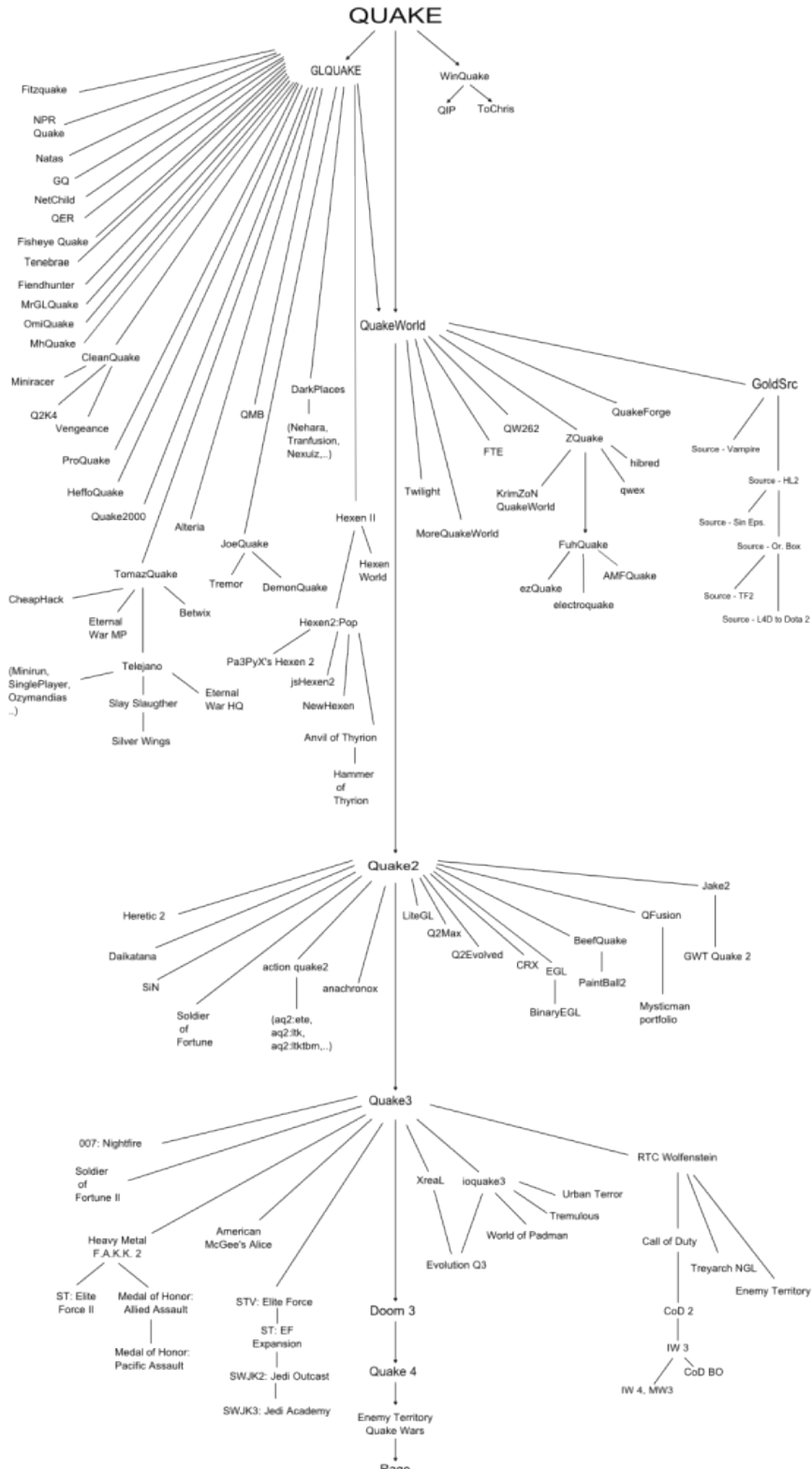


Figure 1: Games descended from idTech1 Engine

Strafe Jumping in Code

When I tried fixing the code so that it just didn't work, I thought it changed the normal running movement in an unfortunate way. — John Carmack, June 3, 1998

Carmack viewed strafe jumping as a bug. Thanks to id's open sourcing of *Quake III Arena* in 2005, we can pinpoint exactly where this bug occurs. In the file “/code/game/bg_pmove.c” we find the following function:

```
//Handles user intended acceleration

static void PM_Accelerate( vec3_t wishdir, float wishspeed, float accel ) {

#if 1

// q2 style

int i;

float addspeed, accelspeed, currentspeed;

currentspeed = DotProduct (pm->ps->velocity, wishdir);

addspeed = wishspeed - currentspeed;

if (addspeed <= 0) {

return;

}

accelspeed = accel*pml.frameTime*wishspeed;

if (accelspeed > addspeed) {
```

```

accelspeed = addspeed;

}

for (i=0 ; i<3 ; i++) {

pm->ps->velocity[i] += accelspeed*wishdir[i];

}

#else

// proper way (avoids strafe jump maxspeed bug), but feels bad

vec3_t    wishVelocity;

vec3_t    pushDir;

float     pushLen;

float     canPush;

VectorScale( wishdir, wishspeed, wishVelocity );

VectorSubtract( wishVelocity, pm->ps->velocity, pushDir );

pushLen = VectorNormalize( pushDir );

canPush = accel*pml.frameTime*wishspeed;

if (canPush > pushLen) {

canPush = pushLen;

}

VectorMA( pm->ps->velocity, canPush, pushDir, pm->ps->velocity
);

#endif

```

}

Following Carmack's mention that his fix for strafing changed "normal" running for the worse, we believe that `PM_Accelerate` is the main place where the physics necessary for strafe jumping are implemented. This function is called when the player wishes to accelerate, taking in the player's intended direction, her intended speed, and an acceleration multiplier. The precise vector math bug is not as important as the comments around the code. First, note that the first block, inside of `"#if 1"`, will always execute. In C, and many other programming languages, 1 is equivalent to true, so this is just a way of block commenting out the second half of the function so it is not evaluated. As the comment in the second block alludes, this code takes out support for strafe jumping. However, it does so at the cost of the game's "feel."

Small choices of how to write highly specific simulations become hugely important and influential to the game design space. As more code and game assets are built on the assumption of a particular behavior, it becomes calcified and cannot be easily changed. This complicates the idea that software is flexible. It also demonstrates that the modern game engine is so complex that even the lead developer on the project cannot always determine the consequences of low level changes. At the platform level, code is difficult to change.

This function can also be found in several other related code bases. We can find the identical function in the `ioQuake` and `qFusion`. This makes sense, as those projects are trying in some way to build on the `idTech3` source releases. We can also go backwards and find identical code in the *Quake II* (id Software, 1997) source code. In fact, while not identical, we can find extremely similar code in the original *Quake* source code. In the *Doom 3* (id Software, 2004) codebase, running on `idTech4`, we find a function with the same code structure, with the same comments, but updated to C++.

In the open-sourced codebase for *Return to Castle Wolfenstein* (2001)

we can find the same function, nearly identical except for a snippet code preceded by this comment:

```
// Ridah, variable friction for AI's
```

“Ridah” was the nickname for a programmer at Gray Matter Interactive, one of the studios that worked on RTCW. The code appears to be a simple modification, not significantly altering the effects of strafe jumping, but it is an example of something that you can find throughout the RTCW codebase. When the developers have modified something “deep” in the engine, code which was originally written by id, they usually noted the change with a signed comment. These signatures are not found in other files that were newly authored for this game, only the engine code. It is a clear indication that idTech3 is a substrate for this new game, and an indication of how different software platforms are from hardware platforms. While hardware modding is certainly possible, it is not a typical, commercial activity. With the source code of the engine available, there is nothing *at a technical level* stopping developers from completely changing the behavior of PM_Accelerate and removing strafe jumping from their games. However, the weight of the surrounding system’s complexity makes any change a risky endeavor, hence the cautious signing of any modifications.

Indeed, complexity would not be enough to stop Carmack from “fixing” strafe jumping if it were a normal glitch. However, this was a glitch which had many vocal defenders in the Quake community.

Strafing, the Player Community and Software Platforms

In his .plan file from Jun 03, 1999 Carmack posted this about strafing:

Some reasonable messages have convinced me that a single immediate jump after landing may be important to gameplay. I’ll experiment with it. Strafe jumping is an exploitable bug. Just because people have practiced hard to allow themselves to take advantage of it does not justify its existence (*sic*). When I tried fixing the code so that it just didn’t work, I thought it changed the normal running

movement in an unfortunate way. In the absense (*sic*) of powerups or level features (wind tunnels, jump pads, etc), the game characters are supposed to be badasses with big guns. Arnold Schwarzenegger (*sic*) and Sigourney Weaver don't get down a hallway by hopping like a bunny rabbit. This is personal preference, but when I play online, I enjoy it more when people are running around dodging, rather than hopping. My personal preference just counts a lot.

His references to action movie stars give a sense of the aesthetic goals that id had for *Quake III Arena*. They were aiming for a cartoony, Hollywood style action adventure. They wanted to empower their players to act out fantasies of being “badasses with big guns.” This is an extraordinary example of a developer responding to community wishes on something as fundamental as movement physics. The Quake community loved the challenge and blazing speed made possible by strafing.

As Carmack mentions when he discusses “normal running”, the “feel” of movement is immensely important for player enjoyment of a game. An episode from the development of *Quake II* illustrates how strongly people feel about slight changes to the movement physics. In the post-release patch 3.15, the following change was made by an id programmer nicknamed “Zoid,” who was maintaining the game: “Player movement code re-written to be similiar (*sic*) to that of NetQuake and later versions of QuakeWorld. Player has more control in the air and gets a boost in vertical speed when jumping off the top of ramps.” In a .plan entry from July 4, 1998 entitled “Here is the real story on the movement physics changes” Carmack addresses concerns of the community surrounding the apparently controversial change. After defending the rights of Zoid to make changes he wanted, Carmack acknowledged that “The air movement code wasn't a good thing to change in Quake 2, because ... subtle physics changes can have lots of unintended effects.” He goes on to note that: “None of the quake physics are remotely close to real world physics, so I don't think one way is significantly more ‘real’ than the other. In Q2, you accelerate from 0 to 27 mph in 1/30 of a second, which just (*sic*) as unrealistic as being able to accelerate in midair.” The next day, the

change was made optional for servers to enable or not, and Carmack closed the issue by reflecting (presumably sarcastically) on “the joy of having a wide audience that knows your email address.”

This movement can be a pleasure in its own right, exemplified by the *Quake III Arena* mod “DeFrag,” which is a movement-based mod in which players navigate obstacle courses as fast as possible. The mod offers several movement styles, including the “vanilla” Q3A, as well as CPMA from the Challenge ProMode Arena mod, which adds increased movement control for skilled players. DeFrag also distributes official map packs to challenge players. These maps are designed to exploit strafe jumping, as well as emergent phenomenon like rocket jumping, in ways that are not found in the conventional deathmatch maps. The goal is to move from one end of the level to the other as fast as possible, and when it was active the community held contests for who could achieve the lowest times on officially sanctioned maps. For some players, DeFrag functions as a training mod, with features which let you keep track of how fast you are moving in order to practice and improve your strafing abilities. The DeFrag scene also embraces and celebrates “tricking” or moving about the level in non-intuitive ways, reminiscent of digital parkour.

The DeFrag community distributes demos that are run in-engine, but they also edit their exploits into machinima. Their movements are synced to music, typically electronic, and the effect is extremely evocative of dance. The most viewed DeFrag video on YouTube is “Event Horizon 2 – Quake 3 Team Trick Jumping” with over 380k views at the time this article was written. Rather than a solo video promoting a single player’s skill, it promotes a “tricking crew.” The bulk of the video’s 15 minutes is devoted to elaborately choreographed group tricks, such as having multiple players firing rockets at the same spot in order to propel another further into the air than is possible alone. It feels very much like a dance troupe.

While DeFrag players push the limits of strafing with their precision, nearly all *Quake III Arena* players who hope to be competitive must learn the basics or be left in the dust. One particularly famous

example is the Bridge-to-Rail jump on the map Q3DM6, or “The Camping Grounds.” This jump allows players to access the map’s only rail gun, a particularly powerful and useful weapon, in a little under 3 seconds from a particular bridge. Without the jump, it takes more on the order of 10-15 seconds, a lifetime in Quake. This jump was clearly designed into the map, and is key to successful play. As evidenced by the numerous YouTube videos demonstrating in detail how to learn the jump, it has become a rite of passage for players.

This demonstrates that while John Carmack and other id programmers may originally have wished to eliminate the “bug” of strafing, by *Quake III Arena* id’s level designers treated it as just another affordance of the engine. They exploited it in their designs, elevating the behavior from glitch to mechanic. In fact *Quake Live* (2010), the browser based version of *Quake III Arena*, features official tutorials on strafe jumping techniques.

Strafe jumping is an important feature for the Quake player community, as exemplified by the DeFrag mod. The community is also central to the persistence of the glitch. id Software fixed many glitches in the course of developing idTech3, but this one survived. It survived in large part because the player community advocated for it as an important part of their play experience.

CONCLUSION

In the course of investigating the phenomenon of strafe jumping, we have developed an account of game engines as software platforms. This allows us to more fully understand the context in which strafing developed and understand strafe jumping itself. Strafe jumping emerged from the complexity of modern game development and the attempt to manage this complexity by abstracting common processes into a game engine. These processes make up the infrastructure that games are built on. As this phenomenon illustrates, small implementation details can have wide ranging effects on the play experience of games using the engine. Game engines are particularly opinionated development tools, ones which are tightly tied to game

genres. Genres require common operational logics to be implemented across games, which creates a problem that game engines solve. Some of these logics, which are below the level of the rules which a game designer specifies, nevertheless exert a large influence over the play experience. As our code study demonstrates, sometimes fully understanding these logics requires careful consideration of their implementation — and a setting aside of the assumption that every aspect of implemented logics should be seen through the lens of authorship.

This study raises questions about the nature of software platforms, particularly with regard to their flexibility or stability. We believe idTech3 to be a distinct platform in its own right, but we have also traced nearly identical code through several generations of idTech engines. While hardware platforms surely share common characteristics between generations, the textuality of code makes it simple to trace specific implementations through different code bases, and the open sourcing culture of id Software made this study possible. A strong argument could be made that all the idTech engines are the same platform; merely iterations on a theme. While we chose to focus on one specific code base, the ease of patching and updating software does complicate platform boundaries.

The social negotiation highlighted in Carmack's open development diaries is another important element. Software's flexibility allowed Carmack to take input and implement changes rapidly, without the manufacturing time and cost associated with hardware. However, the complexity of the engine made it difficult to "fix" strafe jumping. This complicates the idea that hardware is stable and software is flexible. This tension points to further work for software studies beyond games.

Strafe jumping is an unanticipated phenomenon from the platform layer. It is a possibility enabled by specific implementations of the operation logics of navigation and physics, creating a new means of interactive movement through a simulated 3D space. While it originated below the level of the authored rules, some games have

incorporated it as a mechanic and designed game features around it. It was discovered, embraced and advocated for by an active player community. Ultimately, it became a distinctive feature of games built on idTech engines.

END NOTES

[1] With implementations dating back to the 1970s, the “finger” command on some network computer systems allows the querying of a particular user or network resource’s status. For users this can include items such as full name, email address, and special files “.project” and “.plan” — which in some contexts served similar purposes to the (micro) blogging and status updates that are common in today’s social networking approaches. At id, John Carmack used his “.plan” to share information with the public about his current work and ideas, which we reference here as they appear in the archive at <http://floodyberry.com/carmack/plan.html/>.

[2] Further, we understand real world physics easily and unconsciously, but fully comprehending implemented physics requires study.

[3] Beyond a certain point of working against the assumptions and constraints built into an engine, it is more effective for developers to use a different engine or write a new one. For this reason, the decision to use an engine (which may be made by executives rather than developers) is the decision to accept a certain level of constraint from its architecture.

[4] While the term “game engine” may have come into use around the development and release of *DOOM*, the separation of data and process in game development, allowing multiple games to be developed by substituting new data, certainly had prior precedent in the industry — including in the practices of Infocom and LucasArts. However, we are aware of no previous examples of engines licensed by game developers to outside game developers.

[5] In some cases, physical hardware has also been extended through additional chips embedded in game cartridges and other approaches that may not immediately come to mind when hearing the term “peripherals.”

BIBLIOGRAPHY

Aarseth, E. (2004). Genre Trouble | Electronic Book Review. Retrieved April 07, 2015, from <http://www.electronicbookreview.com/thread/firstperson/vigilant>

Anderson, Eike Falk, Steffen Engel, Peter Comminos, and Leigh McLoughlin. 2008. “The Case for Research in Game Engine Architecture.” In *Proceedings of the 2008 Conference on Future Play: Research, Play, Share*, 228–231. Future Play '08. New York, NY, USA: ACM. doi:10.1145/1496984.1497031. <http://doi.acm.org/10.1145/1496984.1497031>.

Apperley, T. H. (2006). Genre and game studies: Toward a critical approach to video game genres. *Simulation & Gaming*, 37(1), 6–23. doi:10.1177/1046878105282278

Bogost, I., & Montfort, N. (2009). *Racing the Beam: The Atari Video Computer System*. MIT Press.

Carmack, John. “The John Carmack .plan Archive.” <http://floodyberry.com/carmack/plan.html>.

Douglass, Jeremy. 2007. “Command Lines: Aesthetics and Technique in Interactive Fiction and New Media”. Dissertation, University of California, Santa Barbara. <http://jeremydouglass.com/dissertation.html>.

Graft, Kris. 2011. “E3: Id’s Carmack, Willits Happy To Be Done With Engine Licensing.” *Gamasutra*. June 8. http://gamasutra.com/view/news/125324/E3_ids_Carmack_Willits_Happy_To_Be_Done_With_Engine_Licensing.php.

Holmes, Shawn. 2002. *Focus on Mod Programming in Quake III Arena*. Boston;; Independence:: Course Technology; CENGAGE Learning Distributor.

Hutchinson, Andrew. 2008. "Making the Water Move: Techno-Historic Limits in the Game Aesthetics of Myst and Doom." *Game Studies* 8 (1). <http://gamestudies.org/0801/articles/hutch>.

id Software. 1993. *DOOM*. <https://github.com/id-Software/DOOM>.

———. 1996. *Quake*. <https://github.com/id-Software/Quake>.

———. 1999. *Quake III Arena*. <https://github.com/id-Software/Quake-III-Arena>.

———. 2004. *Doom 3*. <https://github.com/id-Software/DOOM-3>.

———. 2010. *Quake Live*. <http://www.quakelive.com>.

Jane, Friedhoff. 2013. "Untangling Twine: A Platform Study." http://www.digra.org/wp-content/uploads/digital-library/paper_67.pdf.

Juul, Jesper. 2005. *Half-real: Video Games Between Real Rules and Fictional Worlds*. Cambridge, Mass.: MIT Press.

Kushner, David. 2004. *Masters of Doom: How Two Guys Created an Empire and Transformed Pop Culture*. New York: Random House Trade Paperbacks.

Lederle-Ensign, Dylan. 2013. "Lags, Frags and John Carmack: a Platform Studies Analysis of the Quake III Network Module". Conference Talk presented at the Digra 2013.

Leorke, Dale. 2012. "Rebranding the Platform: The Limitations of 'Platform Studies'." *Digital Culture & Education* 4 (3): 257–268. http://www.digitalcultureandeducation.com/uncategorized/dce1073_leorke_2012_html/.

Lowood, Henry. 2014. "Game Engines and Game History." *Kinephanos* (History of Games International Conference Proceedings). <http://www.kinephanos.ca/2014/game-engines-and-game-history/>.

Mateas Michael and Wardrip-Fruin, Noah. 2009. "Defining Operational Logics." <http://www.digra.org/wp-content/uploads/digital-library/09287.21197.pdf>.

Montfort, Nick, and Ian Bogost. 2009. *Racing the Beam: The Atari Video Computer System*. 2nd ptg. The MIT Press.

Murray, John, and Anastasia Salter. 2015. *Flash: Building the Interactive Web*.

Padworld Entertainment. 2007. *World of Padman*.

Ritual Entertainment. 2003. *Star Trek: Elite Force II*.

Rogue Entertainment. 2000. *American McGee's Alice*.

Sanglard, Fabien. 2012. "Quake 3 Source Code Review." June 30. <http://fabiensanglard.net/quake3/index.php>.

Silicon Ice. 2000. *Urban Terror*.

Tei. 2013. "File:Quake – Family Tree.svg." *Wikipedia, the Free Encyclopedia*. http://en.wikipedia.org/wiki/File:Quake_-_family_tree.svg.

Wardrip-Fruin, Noah. 2009. *Expressive Processing: Digital Fictions, Computer Games, and Software Studies*. The MIT Press.

Warsow Team. 2005. *Warsow*.

Wolf, Mark J.P. (Ed.). (2001). *The Medium of the Video Game*.

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