Describing the Game Studies Canon: A Game Citation Analysis

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ABSTRACT
This article analyzes how game studies scholars cite videogames in their research. A content analysis of over 580 articles from the field's two main journals is used to identify the currently-invisible canon of most-frequently cited games in game scholarship. We show that the canon is far more varied than previously suggested and demonstrate ways that it has changed over time. The article's research implications include explicating different functions of game citation as well as providing an empirical basis for identifying under-researched games. Our findings also identify the games with which familiarity is most important to understand existing research. Finally, we propose ways the game studies canon can help address pedagogical, technological, and legal obstacles to the development of game studies as a discipline.

KEYWORDS
citation analysis; scientometrics; game studies; canon; pedagogy

INTRODUCTION
A canon, in its modern sense, is a group of works given "special importance" by "other cultural transmissions" (Klejsa and Jajko 2017). Although we tend to think of canonized works as masterpieces, the significance given to these works may be for reasons other than their inherent quality. Many artistic forms have multiple canons with different emphases and criteria. Books have bestseller lists (popularity) and the Nobel Prize for Literature (aesthetic quality). Hollywood films have the Academy Awards (industry acclaim) and the US National Film Registry (historical and cultural significance). Videogames are canonized by industry awards and popular press venues that offer "best-of" lists. Yet there is no currently recognized canon of videogames that reflects particular games' importance in academic research.

There are good reasons to resist even identifying a videogame canon. Writing about film canonization, Staiger (1985) expresses the widespread concern that works are canonized not based on their inherent qualities but also (or even primarily) as an expression of problematic social power relations. She argues that canonized works may be valued according to criteria that seem "natural, inherent, universal, or timeless" when in fact these judgments are part of hegemonic suppression of marginal populations (1985, 10). Concerns about hegemony, coupled with decreasing interest in aesthetic evaluation, have caused film scholars to avoid creating or supporting canons in the masterwork tradition (Lupo 2011).

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Canonization also risks suppressing dissenting judgments of critically-praised works, as Zagal (2012) notes in his argument against using videogame canons in the classroom.

The debates about canonization continue despite these valid criticisms because canons cannot be completely avoided in teaching and research. Pedagogically, it is essential that instructors share a common language with their students to explain ideas and part of that common language is a set of examples that can be easily drawn upon and referred to in discussion. Research also frequently requires highlighting certain videogames as representative of aesthetic or historical trends.

As noted, canons can be based on multiple criteria, and need not be lists of masterworks that are normatively presented as videogames teachers and scholars should focus on. In this article, we aim to identify a descriptive canon of videogames that are already being treated with special importance in that they are the most-discussed games in game studies scholarship. This article thus contributes to the growing literature reflexively examining the field of game studies itself.

REVIEW OF LITERATURE

A recent special issue of *Games and Culture* gathered articles discussing the development of game studies over the last two decades with the aim of stimulating "reflective responses about the overall state of the field" (Mäyrä and Sotamaa 2017). Such projects of introspection are valuable in orienting new scholars in the field, highlighting neglected areas of research, and identifying future opportunities for expanding the field in terms of individual research and teaching programs, academic organizations, new publication venues, and other academic infrastructure. Scholars working in this area approach game studies in a number of ways. Some work has attempted to characterize the main topics and intellectual traditions informing game studies in terms of citation patterns (Bragge and Storgårds 2007; Melcer et al. 2015; Coavoux, Boutet, and Zabban 2017; Martin 2018). Quandt et al. (2015) identified the disciplinary backgrounds of game scholars to understand the different academic traditions that have contributed to game studies, and Deterding (2017), analyzing game studies as an interdisciplinary field, argues that it reflects increasingly narrow disciplinary methodologies in its core journals as videogame research gains broader legitimacy, opening up new publication venues.

Some have described the field as "a multidisciplinary field built around a common object" (Coavoux, Boutet, and Zabban 2017, 565), and Deterding's account of game studies' development (2017) compares the field to the interdisciplinary field of urban studies in that it has been organized around one topic, digital games, rather than by any particular methodology. Given that the central fact about game studies is its interest in videogames, and considering the growing number of publications reflexively assessing the field's research outputs, it is surprising that there is little research looking at exactly which videogames are discussed in the field.

One exception is Coavoux, Boutet, and Zabban's "What We Know About Games: A Scientometric Approach to Game Studies in the 2000s" (2017; hereafter, WWK). WWK analyzes articles from the journals *Game Studies* and *Games and Culture* and contributions to the Digital Games Research Association (DiGRA) conference proceedings (the sample includes all pieces published prior to 2014). WWK compiled a data set including, for each paper, its year, publication venue, authors and affiliations, and any games mentioned in the title or abstract. It categorized each videogame mentioned in article titles or abstracts into one of 36 genres and used a topic model analysis to classify articles into topics. Among its conclusions are several findings about videogames cited (i.e., mentioned) in these articles' titles or abstracts, including the following four claims. First, 62% of articles cite at least one videogame in their title or abstract, with *Game Studies* articles more likely to cite specific videogames (69%) than *Games and Culture* articles (58%). Second, the genre WWK refers to as "online games" (which it defines as including massively multiplayer online role-playing games, massively multiplayer online games, and virtual worlds) are "'massively' overrepresented" in the scholarly literature when compared to their popularity among game players, accounting for 50% of games mentioned but a far smaller percentage of videogames played (2017, 571–72). Third, only five videogame series are cited ten times or more: *World of Warcraft, EverQuest*, *Whyville*, *The Sims*, and *Grand Theft Auto*. Fourth, the most-cited videogames and genres share numerous characteristics: they are played online, are commercially

successful, have devoted fan bases that communicate both within and outside the game, demand "active, long-term involvement", and generate "noticeable and measurable forms of sociability" (2017, 572–73).

Two aspects of WWK's analysis motivated our project: these surprising conclusions, which failed to match our intuitions about the field, and methodological concerns. Since game studies is a field organized primarily by its object of study, we would expect the vast majority of articles to discuss specific games or genres even if none are mentioned in the title or abstract. The finding that only 62% of articles mention any game in the abstract or title thus seemed to risk the misleading implication that almost 40% of game studies articles do not discuss videogames to a significant degree, which, if true, would challenge the notion that the object of study is the organizing principle of the field. We were also surprised by the finding that *EverQuest* and *Whyville* are two of the top five most-cited games in game studies; WWK states that this high ranking was due to each game being the focus of one special issue of a journal, and we wanted to investigate how these rankings would be affected by more recent publications and a more inclusive content analysis.

Our primary methodological concern was that analyzing only article titles and abstracts might provide a misleading picture of which games are discussed in game studies research. Games are cited for many different reasons. Sometimes a game is cited because it is the single or main object of analysis in an article. At other times, a game is cited as an exemplar for a genre or a concrete illustration of an abstract concept. A game might also serve as a point of comparison to explain a game that the author expects to be unfamiliar to the reader or as a point of contrast to show how games we might expect to be very similar in fact differ. Yet, while these types of citations are important to game scholarship, they would not typically appear in an article's title or abstract.

This project was conceived as an attempt to more accurately discern whether there is an unidentified canon of videogames commonly discussed in the academic literature, knowledge of which is required to understand and/or contribute to this literature. As previously noted, despite the risks posed by a normative canon and the unexamined criteria it might impose, we consider the games we identify as most-cited to be a descriptive canon, not a prescriptive one, and we do not hold up these games as significant for their inherent qualities, but for their importance in understanding the existing game studies literature. In other words, we aim to answer the question, "What games are most important to know in order to understand current research on games?" By undertaking an analysis focused only on which games are cited (unlike WWK, which also explores institutional and methodological aspects of game studies articles), expanding the sample scope to include more recent years, and examining entire articles rather than just abstracts, we aim to better understand the breadth of games cited in the field and functions of those game citations.

METHODOLOGY

Our analysis focuses exclusively on games cited in the writings published in *Game Studies* and *Games and Culture*. By game citation we mean any mention of a game title or specific game franchise in an article regardless of their inclusion in a reference list or ludography and by game we mean both digital and non-digital games.

This project's methodology differs from WWK's analysis in several ways. First, we considered games cited anywhere in an article (including title, abstract, body, and notes, but excluding games mentioned only in bibliographic source titles) rather than looking only at article titles and abstracts. By limiting its analysis to mentions of games in article titles and abstracts alone, WWK captures only games that authors deem central enough to their articles' theses to merit mention in a place of such prominence. Broadening the sample in this way provides a more accurate picture of which games are cited in the literature. Our hypothesis is that many games will be mentioned outside of titles and abstracts and that analysis of different types of game citations can provide valuable insight into the field of game studies' objects of study.

Second, we analyzed all articles published in *Game Studies* (founded 2001) and *Games and Culture* (founded 2006) from their first issues until September 2018, updating the data set compared to the WWK sample, which ended in 2014. These journals were chosen based on responses to a survey of experts in the field comprised of editors of 10 videogame-focused journals and the Digital Games Research Association's (DiGRA's) list of distinguished scholars in the field (Digital Games Research Association 2018). Presented with a list of 10 journals and asked to rank the journals from 1-4 on the basis of their significance to the field of game studies (1=least significant, 4=most significant), all respondents (n = 13) classified *Games and Culture* and *Game Studies* as either rank 4 or 3, with 83% of respondents classifying *Games and Culture* as most significant and 75% classifying *Game Studies* as most significant (significantly higher than all other journals). Although WWK includes proceedings of the DiGRA conferences in its sample, it provides no methodological justification for doing so other than noting that these conferences are "the main conference in this field" (2017, 566). Our project uses full papers as its corpus rather than abstracts, and Deterding (2017) notes that the number of full papers published in DiGRA conference proceedings has dropped precipitously from 133 in 2009 to 38 in 2015. The cause of this drop is unclear since during this period DiGRA has made changes to many aspects of its conference, including its frequency, submission requirements, and whether abstracts could be submitted in lieu of full papers. Further, WWK does not make clear whether its analysis includes DiGRA abstracts when not accompanied by full papers. Presentation abstracts have different conventions than article abstracts; for example, scholars may not mention specific games in presentation abstracts if they anticipate being able to fill in details verbally during the presentation. For these reasons, the DiGRA proceedings did not appear to be straightforwardly comparable to journal articles, so we did not include them in this first phase of the research project.

Our final methodological difference from WWK involves its exclusion of "editorial articles, book reviews, and interviews with game designers" from its analysis (2017, 566). In contrast, we include these writings in our sample because game citations in such articles serve to increase the influence of those games in game studies discourse in a manner similar to game citations in research articles. Indeed, editorials in particular often aim to be statements about what matters in the field, and as such are important means of developing a game scholarship canon.

We employed three research assistants to help import all articles in the sample as PDF and HTML documents to the citation management software Zotero. Tags were added for every game title or specific game series cited in the article. Different individual games in the same series (e.g., *BioShock* and *BioShock 2*) were given separate tags, as were games mentioned as a franchise or series (e.g., "the *BioShock* series" or "the *Super Mario* games"). This data was exported to a relational database.

For the analysis, games were merged based on series. That is, if an article cited two entries in a series (e.g., *BioShock* and *BioShock* 2) this was coded as a single citation to the game series (e.g., *BioShock*). We merged games in this way only if the game content (both gameplay and format) was sufficiently similar. This choice was motivated by our research question which focuses on the role of familiarity with particular games in understanding articles that cite those games. In other words, our first-pass analysis assumes that the *BioShock* games are similar enough that familiarity with any of the games provides enough context for a reader to understand an article citing the other games in the series. For this purpose, it is more important to know how many articles cite any of the *BioShock* games than to know which of the *BioShock* games are most-commonly cited, which would be an area of potential future research. After merging the games into series, we ran queries on the database to identify how many articles cited each game series, both overall and separated by journal and time periods. In this article, we use the term "game" or "videogame" to refer to a game series in this sense.

FINDINGS

Statistic	Games and Culture	Game Studies	Total
Number of articles	361	221	582
Number of games cited	1093	799	1565*
Number of citation events	2900	1800	4700
Articles where no game is cited	29	15	44
Average citations per article	8.03	8.14	8.08
Standard Deviation citations per article	9.57	9.42	9.51
Minimum citations in single article	0	0	0
Maximum citations in single article	100	77	100

Table 1: Overview of sample

Table 1 reports an overview of the sample. While *Game Studies* has been running for longer than *Games and Culture*, it has published fewer articles overall. However, the average number of games each journal's articles cite is roughly the same. The article with the most citations refers to 100 games, but only 7 articles refer to 50 or more games, and 44 articles refer to 20 or more games.

Game Title	Total Citations
World Of Warcraft	159
Grand Theft Auto	89
Chess	87
EverQuest	73
The Sims	70
Tetris	55
Call Of Duty	51
Half-Life	49
Second Life	48
Civilization	48
SimCity	47
Super Mario Bros.	44
Final Fantasy	43
Halo	42
Dungeons & Dragons	37
Doom	36
Counter-Strike	36
The Elder Scrolls	35
Pac-Man	34
Space Invaders	34
BioShock	32
Fallout	32
Tomb Raider	31
Resident Evil	29
Quake	29
The Legend of Zelda	29
Starcraft	26
Myst	25
Battlefield	23
Mass Effect	23
Metal Gear	22
Pong	22
Soccer	22
Monopoly	21
America's Army	20
Ultima Online	20
Minecraft	20
Football	20

Table 2: Most-cited games

Table 2 reports the most-cited games in the journals. These include a variety of game genres, including MMORPGs (e.g., *World of Warcraft, EverQuest*), open-world games (e.g., *Grand Theft Auto*, *Fallout*),

first-person shooters (e.g., *Half-Life*, *Doom*), puzzle games (e.g., *Myst*, *Tetris*), and strategy games (e.g., *Civilization*, *StarCraft*). It includes games on several platforms, including arcade, PC and consoles. Most of the titles were developed in North America or Japan, with three developed partly or wholly in Europe (*Grand Theft Auto*, *Tomb Raider*, and *Minecraft*). Several non-computer games also appear on the list, with chess ranking as the second most-cited game overall. The importance that WWK claims for online games is only partly supported by our data. Although games such as *World of Warcraft* and *EverQuest* appear high in the list, and *World of Warcraft* is cited far more frequently than any other game, many offline games are also highly ranked. Four of the five games that appear ten times or more in WWK's analysis also appear in the top five of our list, the exception being *Whyville*, which rarely appears outside the 2010 special issue of *Games and Culture* devoted to it. WWK's 6th to 10th most-cited games, however, are starkly different from ours; all of them appear outside our 10 most cited games and those ranked 8th, 13th and 14th (*Dance Dance Revolution*, *Silent Hill* and *Super Monkey Ball*) failing to appear at all among our 38 most-cited games.

Some of the features WWK identifies in its most highly cited games are also found in many games on our list. In particular, all of the games on the list are commercially successful and most have a committed and active fan base. While most of the games have online components, the majority are predominantly offline games. Similarly, while many of the games include multiplayer versions and thus support the kind of sociability that WWK identifies, this is not the case with many of the predominantly single-player titles on the list.

Looking at full articles rather than only abstracts also reduces the apparent gulf between WWK's five most-cited games, the lowest of which is cited 13 times, and the remainder, the highest of which is cited only 6 times. Our analysis shows a much smoother reduction in citation frequency with a broad range of games cited over 20 times.

Figure 1 shows the frequency of game citations; this graph shows how many games are cited in a given number of articles. It shows that a very large number of games (1,078) are each cited in only one article while a smaller number of games are cited in many articles; *World of Warcraft* is the most-cited game (159 articles). These results support WWK's description of game citation distribution as "a strongly overrepresented leaderboard and a long tail of rare titles" (2017, 572). Almost 96% of the 1,565 games cited appear in fewer than 10 articles. WWK's finding that a "few genres receive most of the attention" (2017, 572) is less strongly supported by these results.

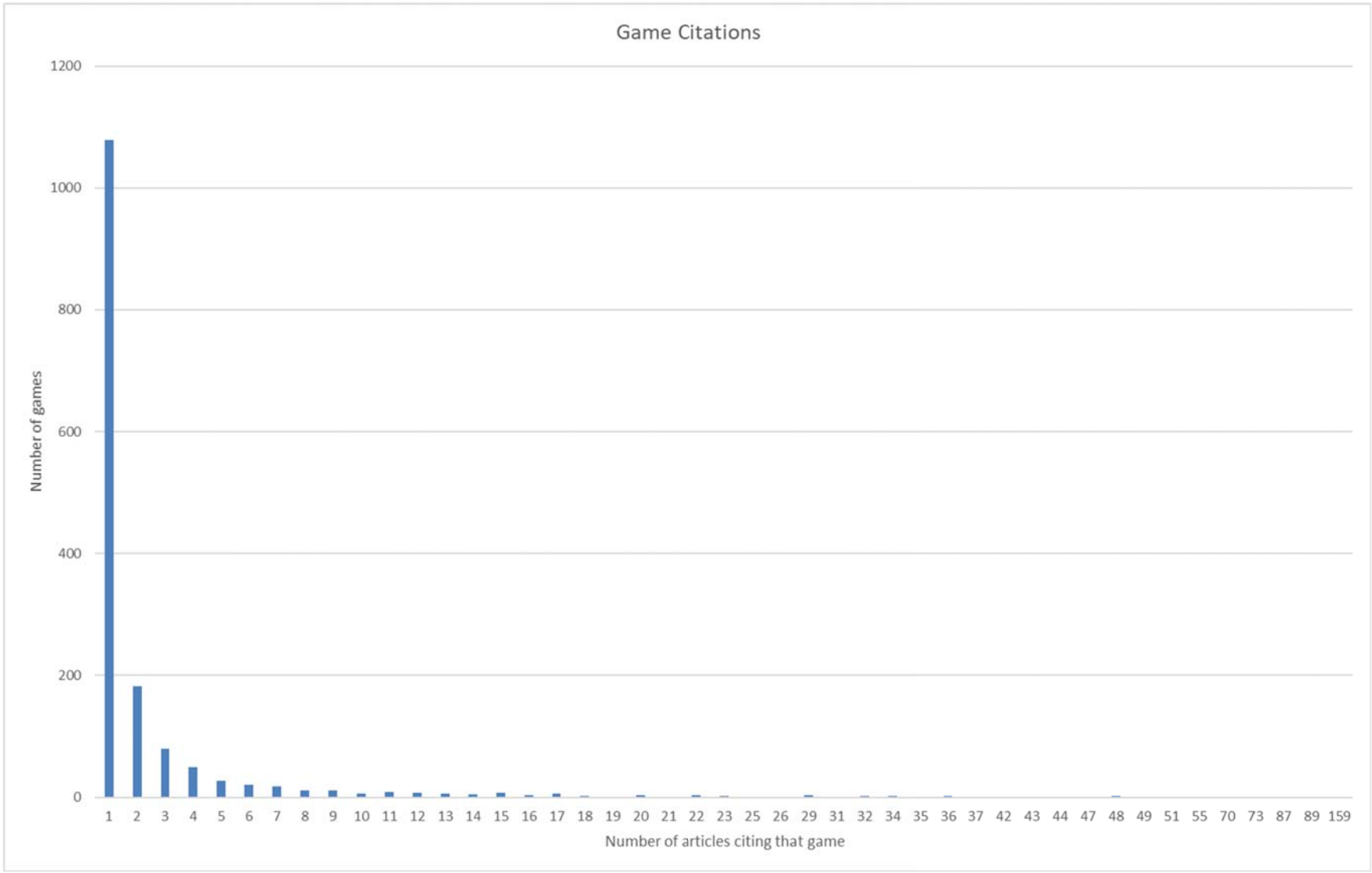

Figure 1: Number of games by the number of articles citing that game.

Game Title	Total	2016-2018	2013-2015	2010-2012	2007-2009	2004-2006	2001-2003
Ultima Online	3%	1%	2%	5%	5%	6%	10%
Quake	5%	2%	4%	4%	8%	6%	23%
Super Mario Bros.	8%	8%	11%	8%	5%	3%	3%
Call Of Duty	9%	12%	13%	5%	8%	0%	0%
Tetris	9%	9%	8%	10%	11%	11%	13%
Final Fantasy	7%	7%	7%	9%	6%	6%	10%

Table 3: Selected most-cited games, total and by three-year period. All values rounded to nearest whole number

Table 3 shows how often several games, each cited in 20 or more articles overall, changed citation frequency over six three-year periods from 2001–2018. The table shows number of citations as a percentage of articles in that period. For example, in the period between 2007 and 2009 *Ultima Online* was cited in 5% of all articles in that period. The table shows examples of three kinds of citation patterns. The first two rows present games that are highly cited in earlier periods and tail off in later periods (*Ultima Online* and *Quake*). The middle two rows show games whose citedness increases in later periods (*Super Mario Bros.* and *Call of Duty*). The last two rows include games whose citedness remains approximately the same across the 18 years (*Tetris* and *Final Fantasy*).

2001-2003			
Rank	**Game Title**	**Citations this period**	**Percentage citing articles**
1	Chess	9	29%
2	*Quake*	7	23%
2	*SimCity*	7	23%
2	*Half-Life*	7	23%
3	*The Sims*	6	19%
4	*Doom*	5	16%
4	*EverQuest*	5	16%
5	*Tetris*	4	13%
5	*Civilization*	4	13%
5	*Counter-Strike*	4	13%
2004-2006			
Rank	**Game Title**	**Citations this period**	**Percentage citing articles**
1	*World Of Warcraft*	17	27%
2	*EverQuest*	13	21%
3	Chess	12	19%
4	*The Sims*	11	17%
5	*Grand Theft Auto*	8	13%
2007-2009			
Rank	**Game Title**	**Citations this period**	**Percentage citing articles**
1	*World Of Warcraft*	24	38%
2	*Grand Theft Auto*	17	27%
3	Chess	12	19%
4	*The Sims*	11	17%
4	*EverQuest*	11	17%
5	*Counter-Strike*	9	14%

Table 4: Most-cited games in the 3 earliest 3-year periods.

2010-2012			
Rank	**Game Title**	**Citations this period**	**Percentage citing articles**
1	*World Of Warcraft*	51	46%
2	*EverQuest*	27	24%
3	*Second Life*	24	21%
4	*Grand Theft Auto*	22	20%
4	*The Sims*	22	20%
5	*Half-Life*	16	14%
2013-2015			
Rank	**Game Title**	**Citations this period**	**Percentage citing articles**
1	*World Of Warcraft*	33	22%
2	*Grand Theft Auto*	25	17%
3	Chess	22	15%
4	*Call Of Duty*	20	13%
5	*Super Mario Bros.*	16	11%
2016-2018			
Rank	**Game Title**	**Citations this period**	**Percentage citing articles**
1	*World Of Warcraft*	34	21%
2	*Call Of Duty*	20	12%
3	Chess	17	10%
4	*Grand Theft Auto*	15	9%
5	*Tetris*	14	9%
5	*The Elder Scrolls*	14	9%
5	*BioShock*	14	9%
5	*League Of Legends*	14	9%

Table 5: Most-cited games in three later three-year periods. All values rounded to nearest whole number.

Tables 4 and 5 show the most-cited games in each three-year period reported as a percentage of all articles in that period. These tables again suggest both stability and variation in game citations across these periods, with a few games being highly cited across periods but the majority appearing in the most-cited games for only one or two periods. No games appear in the top five list of each period. Only three games (*World of Warcraft*, *Grand Theft Auto,* and chess) appear in five lists. Two games (*The Sims* and *EverQuest*) appears in four lists and four games (*Tetris*, *Half-Life*, *Counter-Strike* and *Call of Duty*) appear in two. The remaining nine games appear only once. (*Quake*, *SimCity*, *Doom*, *Civilization*, *Second Life*, *Super Mario Bros.*, *The Elder Scrolls*, *BioShock* and *League of Legends*). Taken together,

Tables 4 and 5 suggest that the game studies canon varies significantly over time although some games do remain important touchstones throughout the history of the field.

Rank	Game Series	Total Citations	Percentage articles	Rank in Games and Culture
1	Chess	39	18%	3
2	*World Of Warcraft*	37	17%	1
3	*Grand Theft Auto*	34	15%	2
4	*The Sims*	29	13%	5
5	*EverQuest*	28	13%	4
6	*Civilization**	26	12%	14
7	*Tetris*	25	11%	7
8	*Call Of Duty*	22	10%	8
9	*SimCity*	19	9%	9
9	*Half-Life*	19	9%	7
10	*Super Mario Bros.**	18	8%	11
10	*Pac-Man**	18	8%	19

Table 6: Games cited by most articles in *Game Studies*. * indicates games that are not in the 10 most cited games list for *Games and Culture*. All values rounded to nearest whole number.

Rank	Game Series	Total Citations	Percentage articles	Rank in Game Studies
1	*World Of Warcraft*	122	34%	2
2	*Grand Theft Auto*	55	15%	3
3	Chess	48	13%	1
4	*EverQuest*	45	12%	5
5	*The Sims*	41	11%	4
6	*Second Life**	35	10%	14
7	*Tetris*	30	8%	7
7	*Half-Life*	30	8%	9
8	*Final Fantasy**	29	8%	13
8	*Call Of Duty*	29	8%	8
9	*SimCity*	28	8%	9
10	*Halo**	27	7%	12

Table 7: Games cited by most articles in *Games and Culture*. * indicates games that are not in the 10 most cited games list for *Game Studies*. All values rounded to nearest whole number.

Tables 6 and 7 compare game citations by journal. The two journals have a very similar list of highly cited games, with seven games appearing on both lists in similar positions. The *Game Studies* 10 most-cited list includes *Civilization*, *Super Mario Bros.* and *Pac-Man*, which appear lower down for *Games and Culture* at positions 14, 11 and 19. *Games and Culture*'s 10 most-cited list includes *Second Life*, *Final Fantasy* and *Halo*, which appear lower down in *Game Studies* at positions 14, 13 and 12. These findings suggest that the two journals broadly share the same canon.

Type of article	Number of articles
Research article	26
Book review	4
Short essay in first issue of *Games and Culture*	5
Editorial/Introduction to special issue	6
Call for papers	3
Total	44

Table 8: Overview of articles with no games cited.

Table 8 describes the types of articles in which no games are cited. About 60% of these articles are research articles; the remainder are short editorials, essays, introductions, or book reviews. 30 research articles cite no games. These are frequently theoretical essays (e.g., Crogan 2007), articles about game production (e.g., O'Donnell 2011), analyses of player discourse (e.g., Thompson 2014), or articles involving unnamed games without commercial distribution designed to improve educational or health outcomes (e.g., Arnseth 2006). The vast majority of articles (92%) cite at least one game. If we remove citations to games that are not videogames (e.g. board games and sports) then a slightly smaller majority of articles (89%) cite at least one videogame.

DISCUSSION

One motivation for our analysis was the apparent disconnect between the belief that the field of game studies is primarily organized around a common object of study and WWK's finding that almost 40% of research articles in *Games and Culture* and *Game Studies* failed to cite any specific games. Our analysis supports the earlier view, finding that games are cited in almost 90% of articles in our sample. The difference between an abstract-only and a full-text methodology is made even more clear by applying our methodology to a sample approximating WWK's (only research articles in the period ending in 2014), which finds 89% of these articles cite videogames even though only 62% cite videogames in their title or abstract.

The fact that 30% of articles cite games in their body text but not their titles or abstracts also supports our earlier suggestion that many types of game citations are not captured by an abstract-only methodology. To illustrate, let us take the example of *Tetris*. WWK does not mention *Tetris* as it is rarely cited in an article's title or abstract (our sample contains only one such citation). This absence suggests that few articles present a dedicated analysis of *Tetris* or present it as a primary supporting example. However, in our analysis *Tetris* is the sixth most-cited game overall. A closer look at these citations help illuminate the functions *Tetris* has played in the game scholarship over time. Several articles cite *Tetris* as an archetypal game or an important landmark in the history of games (Järvinen 2004; Parikka and Suominen 2006; Lastowka 2006; Chan 2008; Mosca 2017). Others use *Tetris* as an exemplar of abstract or puzzle games (Woods 2004; Barton 2008). The abstract, single-player characteristics of *Tetris* make it an important test case in developing general concepts and definitions of games. For example, Stenros (2017) uses *Tetris* to point out the shortcomings of a definition that require games to have adversaries. *Tetris* is also frequently used to illustrate theoretical concepts (Tychsen and Hitchens 2009; Wood 2012; Iversen 2012; Stamenković and Jaćević 2015; Friedman 2015; C. Cremin 2016; Reynolds 2016). *Tetris* is invoked in discussions of player-game identification (Newman 2002; Calleja 2007), the nature of rules (Wirman 2014; Tulloch 2014), and goals and rewards (Cover 2006; Elverdam and Aarseth 2007; Gazzard 2011; Bateman 2015). The most frequent use of *Tetris,* however, involves the role of narrative in games and the related discussion of games and interpretation. Beginning with an interchange between Janet Murray (1997) and Markku Eskelinen

(2001) on the possibilities for interpreting *Tetris,* the game quickly became central to discussions of interpretation (Juul 2001; Lindley 2005; Gee 2006; Simons 2007; Hall and Baird 2008; Voorhees 2009; Gosling and Crawford 2011; Gibbons 2011; Ip 2011; Leino 2012; Schulzke 2014; Arjoranta 2017).

The example of *Tetris* shows that, like *World of Warcraft* or *Grand Theft Auto*, it has been tremendously influential in the development of concepts and theories in game scholarship, but unlike those games, it is only rarely the main focus of any given article. This example suggests at least two kinds of influential games: important touchstones that are cited as illustrative examples but only briefly discussed and more-visible games that often serve as a main object of analysis. The suggestion that a limited number of games and genres exercise disproportionate influence in game studies cannot be evaluated without recognizing that games can exert influence in numerous ways.

We might apply this observation to the common suggestion that sports videogames are a blind spot in game scholarship. Leonard, for example, describes the academic study of sports videogames as "a barren wasteland of knowledge" (2006, 393). Although there have been significant developments in research on sports videogames over the last decade, including two edited collections devoted to the topic (Consalvo, Mitgutsch, and Stein 2013; Brookey and Oates 2015), the view that sports videogames are generally ignored in the game studies literature continues.

Our analysis suggests that this view accurately reflects an absence of articles focusing primarily on sports videogames but incorrectly implies that such games do not appear in game studies articles overall. Of the 112 articles that cite sports videogames, only 5 are centrally about sports games (Ng 2006; Moeller, Esplin, and Conway 2009; Hutchinson 2007; Crawford 2015; Schell et al. 2016). The majority use sports games to develop concepts that are not specific to that genre. These include discussions of the form and structure of games (Newman 2002; Zagal, Fernández-Vara, and Mateas 2008; Tychsen and Hitchens 2009; Calleja 2010; Woods 2011; Gazzard 2011; Harper 2011; Iversen 2012; Colin Cremin 2012), issues around gender and race (Leonard 2006; Monson 2012; Fisher 2015; Perreault et al. 2018; Cote 2018; Mukherjee 2018), types of players (Bryant, Akerman, and Drell 2010; Payne 2012; Fisher 2015; Osmanovic and Pecchioni 2016; Klevjer and Hovden 2017), game controls (Wirman 2014; Blomberg 2018), the nature of rules (Smith 2007; Thorhauge 2013), narrative (Ip 2011), older adult play (Souders et al. 2016), games for health (Thin, Hansen, and McEachen 2011; Cutler, Hicks, and Innes 2016), physicality (Wilson 2011; Veerapen 2013), and—in the case of references to *Pong*—the place of sports in the history of videogames (Veerapen 2013; Picard 2013). In sum, while critics are correct to suggest that few articles focus on sports videogames and that sustained research programs may be needed in this area, it is not the case that game studies has ignored sports videogames overall. Authors regularly invoke these games as examples to develop a wide range of concepts and theories central to game studies.

Another significant type of article that WWK's methodology systematically excludes is the broad survey. None of the seven articles in our sample that cite more than 50 games mentions any games in their titles or abstracts. On inspection, such articles are often expressly set up to broaden the scope of game studies. Hitchens (2011), for example, identifies the purpose of his survey of first person shooters—a survey that mentions 80 games—as expanding knowledge of first person shooters beyond the "limited set of examples" that the author argues is found in game scholarship. In other words, game scholarship is consciously attempting to develop knowledge using non-canonical examples, but this does not tend to cite games in the same way as those articles discussing canonical games.

Lastly, our analysis reveals changes in game citation over the sample's 18-year publication period. Two trends are evident. First, five of the seven survey articles that cite more than 50 games occur after 2011, which may indicate a developing interest within game studies of increasing the scope of games as objects of analysis. Second, we see variation among games regarding the consistency of their citation frequency over time. As can be seen in Table 5, some games remain highly cited across all six periods whereas others increase or decrease in citation frequency over time. Games that grow in citation frequency are sometimes newly published games (e.g., *BioShock* and *League of Legends* are cited more

frequently in the latter half of the sample) but other times are older games that experience a renaissance of interest (e.g., *Super Mario Bros.* and *The Legend of Zelda* are most frequently cited after 2013).

WWK convincingly argues for path dependence as an explanation of the continued importance of a core set of games and genres in game studies (2017, 575). On this account, games that are established as important objects of analysis early on in game scholarship continue to be cited and analyzed due to positive feedback mechanisms, such as an obligation to acknowledge existing relevant publications. Our results suggest that, while path-dependence may operate to maintain the high citation ranking for some games, a countervailing force exists that encourages discussion of an increasingly broad set of games. The final two periods analyzed (2013–2015 and 2016–2018) show a decline in the percentage of articles citing the most-cited games, which suggests a broadening range of games analyzed during these periods. This trend towards citing a greater variety of games can be explained, we suggest, by the increasing number of articles published in these journals each year, which provides more outlets for novel research. Rather than hewing solely to the games established as touchstones in the early period of game studies, scholars are also expanding game scholarship into other games and game types.

The games listed in what we call a descriptive game studies canon are already treated as significant by virtue of their citation frequency. Identifying the specific games in this list, however, can affect research by accurately determining under-researched games and genres and by allowing further study of the numerous factors that contribute to any particular game's citation ranking.

The canon can also play an important role in introducing new scholars and students to game studies research. Simply put, students who are not familiar with *World of Warcraft* will not fully understand more than a quarter of the articles in the field's two leading journals. The more students know *World of Warcraft*, the better they will be able to critically engage with the arguments put forth in articles citing that game, and the same is true for *Tetris, Grand Theft Auto*, and other highly cited "canonical" games.

Given that one learning outcome of most game studies classes is understanding theories and concepts that have been developed in the field, such classes must teach students to read and understand the literature produced by that field. Consequently, familiarizing students with these canonical games seems a primary task for the game studies educator. We in no way advocate limiting class assignments or discussion to canonical games—as noted by Zagal (2012), there are many benefits to teaching simple, non-commercial, and non-traditional games—but instructors who do not make positive efforts to familiarize students with highly cited games potentially impair those students' ability to engage with current game studies research. Instructors cannot assume that the game studies canon is comprised of games everyone has played or knows to some degree. For those teaching outside of their own cultural context, students may have markedly different experiences with computer games, and outside of a North American/European/Australian context, these experiences frequently differ from the games commonly cited in the field. As the years pass, the expectation that students, whatever their background, are familiar with older games also becomes less tenable (often, even students with similar cultural backgrounds are unfamiliar with canonical games their instructors know well). Also, since game studies classes (particularly those outside of game development curricula) increasingly contain students who rarely play anything other than casual games, it is remiss to assume that students understand the experience of playing canonical games even if they know their titles, characters, or genre. For many game studies classes, providing students with a basic knowledge of touchstone games can be seen as a prerequisite to achieving class objectives. And, if the game studies canon is used as a resource in multiple courses, it could motivate teachers to share best practices on incorporating clips, in-class playthroughs, and assigned games levels in course curricula.

The game studies canon presented here also has implications for technological and legal barriers to teaching and research. Some videogame hardware and software is obsolete or inaccessible, either generally or in particular geographic regions, which poses particular problems for studying arcade games such as *Space Invaders*, which is frequently cited despite the fact that many people in game studies have never played the original 1978 version. Copyright restrictions can prevent teachers from legally providing access to a game for instructional purposes, especially since game distribution

services such as Steam lack affordable solutions for using games in an educational context. The game studies canon can help in developing solutions to some of these challenges by allowing members of the research community to focus their efforts on a set of games rather than scholars facing such obstacles individually based on their own teaching and research interests. Although it seems unlikely that game developers and publishers would provide support for all games in terms of educational access, technical support, or legal permissions, coordinated action may be successful in securing such support for a more well-defined subset of canonized games that have been demonstrated to be especially relevant to the field.

CONCLUSION

Analyzing game citations in the full text of all articles published in *Game Studies* and *Games and Culture* suggests several revisions to previous findings on this topic. While we agree that massively-multiplayer online games are among the most-cited games in the literature, we found a wide variety of game genres, including offline games that are also cited quite frequently. Our analysis also reveals that highly-cited games include not just games that are the primary focus of an article, but also historical touchstones that are influential through their versatile utility as examples. A detailed look at citation patterns in sports videogames, for example, undermines the notion that the field has broadly ignored this popular genre. We note that this game studies canon describes current practices, and while it should not be used unreflectively as a template for course design, instructors should be aware of the usefulness of this resource in preparing their students to engage with relevant game studies research. Finally, we argue that the game studies canon has a potentially important role to play in focusing efforts to overcome technical and legal obstacles to game studies research and teaching.

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