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18

Cheating in *Candy Crush Saga*

Marcus Carter and Staffan Björk

Freemium' describes an economic model for digital software that involves a free basic service, with premium content available for customers that choose to pay. Freemium games are thus 'free-to-play' (F2P) and have grown enormously popular in tandem with the emergence of 'casual' games popular on non-dedicated mobile gaming platforms (such as iOS or Android devices) and social network sites (SNSs) (such as Facebook). A December 2012 survey estimated that revenue from free mobile and computer games has surpassed revenue from paid titles in the United States (Amano 2013).

Candy Crush Saga is one of the most commercially successful freemium games, being F2P while offering purchases of in-game 'lives' and advantages at a relatively low cost (ranging between US\$0.99 and US\$2.99 on the iOS version). This allows players to immediately restore their limited number of lives and continue playing or get help at advancing past a level that is particularly difficult. It is not possible to simply pay to advance past a level, but this monetization strategy still gives players an advantage in comparison to players who do not wish to pay. The game was released in 2012 for Facebook and mobile devices (iOS and Android). By March 2013, *Candy Crush Saga* had surpassed Zynga's *Farmville 2* as the most popular game on Facebook and has been estimated at making between US\$1 million and US\$3 million from in-app purchases (IAPs) *per day* (Shanley 2013). With over 100 million active daily players (Dredge 2013), *Candy Crush Saga* is the most popular single game in the world.

In this chapter we discuss results from a series of interviews with *Candy Crush* players that revealed that many players consider these in-game purchases – crucial to the commercial success of this game and many others in its genre – to be a form of cheating. We thus contribute to this volume a critique of this business model driven not from ethical criticisms, but as a payment system configured in conflict with player motivations.

Cheating

Before discussing *Candy Crush Saga* and our results, we briefly overview some earlier attempts to conceptualize the phenomenon of cheating. This is to later use them as theoretical lenses for understanding why players may consider in-game purchases cheating.

In her aptly named book, *Cheating* (2007), Mia Consalvo argues that, while understood from a structuralist perspective (e.g. Suits 1978) as a transgressive and non-playful act, cheating (loosely defined in multiplayer games as ‘gaining an unfair advantage’, such as hacking the game to make your character stronger) is inherently playful and reflects the nature of digital games as spaces for experimentation. She leaves this definition open to facilitate understanding the dynamic cultural and social character of cheating in multiplayer online games (MOGs). Similarly, Jonas Smith (2004, 5) sees cheating as an ‘*altogether social construction*’; as a form of ‘extra-mechanical conflict’ similar to grieving and other local norm violations, rather than a game-breaking act.

Through the lens of *Neopets* (Powell and Williams 1999), Delia Dumitrica (2011, 21–2) instead understands cheating as the product of a culture ‘embedded in and recommended by the structure’ of the neo-liberal capitalistic discourse of many modern online gaming environments. Darryl Woodford (2013), drawing on examples from the online gambling industry, subsequently argues for conceptualizing some forms of cheating as (lawful) ‘advantage play’ in order to ‘loosen up’ the regulation of online environments. He defines advantage play as play ‘in which the player is able to turn the mechanics of the environment to their advantage without breaching the rules of the environment’ and argues that the key contribution of such a concept is to extend our conceptualization of play acts beyond a clear dichotomy of legal/illegal. This is not dissimilar to ‘cheese’ in *Warhammer 40,000* (see Harrop, Gibbs and Carter 2013) which is considered ‘fair play’ by competitive players.

Grounded in their investigation of ‘botting’ in the massively multiplayer online game (MMOGs) *Tibia*, De Paoli and Kerr (De Paoli and Kerr 2009; 2010) instead approach cheating as a socio-technical process and attempt to

go beyond defining cheating as that which provides unfair advantage. They argue that doing so limits theoretical and empirical investigations; cheating should be understood through the concept of assemblage (DeLanda 2005; 2006) in order to focus on the interrelational dynamics of games. Through a theoretical analysis of MMOGs as assemblage, they argue that cheating is an *imbroglio*, 'the entanglement – as interrelation – of different elements, whose purpose is to obtain a successful trick as result' (2010) and argue for understanding cheating as more than just a violation of rules.

Distinct from these approaches, and detached from a rule-based definition, Carter, Gibbs and Arnold (2015) consider cheating one of the moral, 'stylistic resources' available to players in their negotiation of what play is acceptable in multiplayer games. Developed through an analysis of match-throwing, bribery and espionage in *EVE Online's* eSport (see also, Carter and Gibbs 2013), they emphasize how the definitions and boundaries of the concept of cheating to players are 'shaped by the local contingencies of the moment' Carter, Gibbs and Arnold (2015), drawn on as a resource in including or excluding certain types of play from the sphere of acceptable activities in games. They note how players draw upon different conflicting and competing definitions of cheating, 'defining and redefining it to encompass [or not encompass] the play' Carter, Gibbs and Arnold (2015). In the discussion, we will argue that this conceptualization, as a rhetorical resource to delineate unacceptable play, is most appropriate for understanding player's reference to *Candy Crush's* monetization as a form of cheating.

Research design

As a result of its unparalleled success, criticisms of its business model, and the comparative lack of academic attention casual games have received, we set out to study the player experience *Candy Crush Saga*. This research draws upon nine, 20–45 minute, semi-structured interviews with *Candy Crush* players, with interviews coded and analysed with practices congruent with grounded theory (Glauser and Strauss 1967). Participants in *Candy Crush Saga's* largest demographic – 18–35-year-old women – were specifically sought, as they are typically under-represented in studies of players. In addition, time was spent reviewing online discussions of *Candy Crush Saga*. Our research in this study is also informed by an auto-ethnographic approach (see Linderoth, Björk and Olsson 2012) as the authors of this chapter have spent significant time playing *Candy Crush Saga* – collectively completing over 500 levels (Carter 200 levels, Björk 356 levels) but having spent no money on in-game purchases.

In approaching the attitudes towards what constitutes cheating in *Candy Crush*, we attempted to avoid a priori judgements about the value, ethics or morality of *Candy Crush*'s design and monetization practices, as it is player perceptions of these (rather than a supposed objective 'evilness') that we seek to identify and understand.

Candy Crush Saga

Released in 2012, *Candy Crush Saga* extends earlier tile-matching games such as *Bejeweled* with a progression system (see Figure 18.1), Facebook integration, limited 'lives' and increasing difficulty over time. The player earns points by switching a piece of candy with an adjacent candy piece to match a minimum of three similar candy pieces together which are then removed from the board. The game offers two primary modes for play; *timed*, where the player can make as many moves as possible until a timer reaches zero and *limited moves*, where the player has to reach a particular goal within a limited number of switches. Combining four or five tiles in a single move unlocks more powerful pieces of candy, such as the 'freckle', which when combined with a piece of candy destroys all pieces of candy of that colour on the board. Often (with a little luck), as candies fall in to replace those removed, a single move can cascade into a chain of satisfying and visually spectacular explosions.¹

When completing the goal of a level (e.g. get 20,000 points), the user receives one to three stars for their performance and unlocks the next level which has a slightly different, incrementally harder challenge. As the user progresses through levels, additional modes and candy types are unlocked. When integrated through Facebook, a user's progression is shared across the platforms they use to play. Through combining these new level types and different candy, *Candy Crush* offers an increasingly difficult and varied player experience.

FIGURE 18.1 *Bejeweled* (left) and *Candy Crush Saga* (right).

Increasing the difficulty of *Candy Crush* is the limited number of lives a player has. When they fail a level, the user loses a ‘life’ which they regain following a 25-minute timer (see Figures 18.2 and 18.3). As the player can only have a maximum of six lives at any time, play is prevented from occurring in long uninterrupted sessions. The game (on mobile devices) can be configured

FIGURE 18.2 *Levels in Candy Crush Saga.*

FIGURE 18.3 *Level 395 in Candy Crush Saga.*

to notify the user when a new life becomes available. This type of wholly artificial limitation, not implemented for multiplayer balance or justified in the in-game narrative, is one of the most common monetization practices in freemium games.

Monetizing *Candy Crush*

Candy Crush Saga implements a number of different design patterns (Björk and Holopainen 2004) which are then modified for monetization. The most prominent of these is made possible as a result of players having limited LIVES;² players are able to pay the small sum of US\$0.99 for five extra lives immediately. As games of *Candy Crush Saga* typically last for only a few minutes, such purchases can be made frequently, creating the possibility of players losing track of how much money they're spending while playing the game. It is in fact very difficult to track the amount of money spent on *Candy Crush* (and app games in general), something which both Apple and Google have received considerable criticism for (see Sarkar 2014). We do not want to suggest that artificial limits on lives are themselves a dark design pattern – defined by Zagal, Björk and Lewis (2013) as a design pattern 'used intentionally by a game creator to cause negative experiences for players which are against their best interests and likely to happen without their consent' (2013, 7). However, combining this feature with monetary design patterns such as PAY-TO-SKIP, PLAYING BY APPOINTMENT and SOCIAL PYRAMID SCHEME, *Candy Crush* creates the possibility for it to meet the criteria of a dark design pattern.

The maximum number of LIVES is also monetized; players can make a one-time US\$16.99 payment to permanently increase the maximum number of available lives from five to eight. Games on the Apple mobile App Store are normally priced at around US\$0.99–5, with very few games retailing in excess of US\$10. Consequently, this freemium tactic would be categorized as dark by Zagal, Björk and Lewis (2013) criteria as players are not aware of how much money they will have to spend in order to achieve their goals in the game. Making this one-time purchase gives players eight uninterrupted play sessions every three-and-a-half hours, a permanent advantage over others. Indeed, the psychology of this purchase is in stark contrast to purchasing a finite number of lives, which are immediately consumed, compared to increasing the number of lives permanently.

While those monetization strategies offer the opportunity to play, the second category of monetization is through in-game advantage. Players are able to buy 'power-ups' which can be stored and used at any time such as the finite ability to turn pieces of candy into more powerful candy (US\$1.99)

or a lollipop hammer (US\$1.99) which can destroy any individual candy. Other forms of these boosters are extra moves and extra time, advantages that can help a user progress through a difficult level.

Notable is the fact that the user is unable, through any monetary- or social-capital-based design, to skip a level. The in-game purchases only allow players advantage in completing a level, but do not guarantee the level that will be complete even if the user spends US\$10 of boosters. This absence features prominently in online discussions.

Cheating at *Candy Crush*

In our research, we found two distinct types of play that players felt were a form of cheating. First, there were technical cheats; using a third-party program during web browser play or altering the system time on a mobile device to trick the application into thinking enough time had passed so lives regenerated. The second surprising category of research that emerged was in-game purchases as a form of cheating; buying extra lives or in-game advantages. In this section we present the results of our interviews with *Candy Crush* players and explore the boundaries of what players consider cheating in *Candy Crush Saga*.

Technical cheats

There are two types of technical exploits defined as cheats by our participants. The first is, when playing on iOS devices, to change the system clock. Doing so tricks the *Candy Crush* application into thinking that time has passed and consequently, lives are regenerated immediately. A simple google search of 'Candy Crush free lives' or 'Candy Crush cheats' brings up numerous sites (some malware) that encourage users to do this cheat, but warn that it affects other applications (such as calendars, alarms and email). This latter consequence was enough for participant Ash³ (29, M) to avoid this cheat; 'I normally don't do that because . . . if you just change everything in other applications like email or whatever it is not a good idea.'

With the exception of Ariana (21, F) (who did not want to be told what the possible cheats were, lest it ruin her ongoing *Candy Crush* experience) all our participants had no objection to this form of cheating. Jenny (25, F) suggested that 'cheating to get extra lives is fine, because I still have to complete the task, you know what I mean?'; the extra lives only subverted control over access to the game, rather than the in-game challenge. Participant Brock (31, M) similarly separated the two:

It doesn't help you finish the level, it just gives you the chance to play the game again, so in that sense I probably wouldn't have a problem cheating the candy crush empire out of another dollar; I probably wouldn't really care!

This was a sentiment we also saw expressed online, with Kotaku's Mike Fahey suggesting that this exploit 'isn't cheating, it's time travel' (Fahey 2013). So despite it circumventing the coded rules of the game, it wasn't cheating because it did not affect *Candy Crush* play directly.

Notably, we found that knowing of this cheat had negative consequences. Jenny, a PhD student, explained that when she had to wait for lives to respawn *Candy Crush* better integrated with her daily life:

It was really good because I would have to mark 2 essays and then I got another life. It was a good sort of reward system for myself but now I've discovered how to get unlimited lives and it's become more of a negative influence.

Rather than the limited lives simply causing frustration that players might attempt to overcome by paying US\$0.99, it meant that *Candy Crush* better integrated with players' lives. Erika (25, F), whom we interviewed after she had deleted the *Candy Crush* app from her phone for consuming too much of her time and attention, was also glad she didn't know about this exploit beforehand; 'I probably would have just played for hours.'

The second type of technical exploit was third-party software that *Candy Crush* players can install on their computers, affording unlimited lives or unlimited in-game power-ups. Only Ash (29, M) had ever used these tools, but his use reflected the attitudes of other players towards monetization. Ash was a player who had begun playing with his friends overseas and had integrated *Candy Crush* with Facebook so that they could compete and compare their progress. After he told us about his use of third-party programs, which he concealed from these friends, I asked why he installed this software:

I guess maybe it's the frustrating experience oh and you get sometimes there is one or two steps to finish that you can't, then you end up failed and you feel bad and, and, as a computer scientist you know how the computer works and I guess yeah you lets you think about there must be something to bypass this thing so I start searching and if you enter it in google you will find it. And back to the question why I didn't pay and how is it fair to our friends and my answer is; they choose to pay I choose to use those tools. So it's kind of the same.

Researcher: So yours is just the thrifty, the cheap option
Ash: Yeah.

This justification of using a technical exploit worked to categorize purchasing in-game advantages as a form of cheating. Ash, who had refused to pay, felt that his friends were cheating by making in-game purchases of power-ups. Like Consalvo's (2007) definition of cheating as gaining an unfair advantage, to Ash, paying money was also an unfair advantage, a fact he used to justify his own use of technical exploits.

In-game purchases as cheating

Of our participants who had paid, none had bought power-ups. I asked Jessie (25, F), who had spent approximately US\$25 on extra lives while playing *Candy Crush*, why she had never bought them:

Um, well firstly because I thought it was like a waste of money, a bit like cheating, you know? Um, and you know, it would be better if I could say [to my friends] that I'd never used power ups because it's quite difficult to do that.

Similarly, after asking Jenny (25, F) who hadn't paid any money in *Candy Crush*, why not just pay a dollar to progress past a 'frustrating' level she had been stuck on for a long time, she argued 'because then I won't have completed the challenge. It feels like cheating'. We later questioned how it was cheating:

I just feel like I haven't, I feel like it would be like taking the soft option to get through the task and I wouldn't get the same level of satisfaction out of it which is the whole reason I play.

What these justifications come down to is the motivation a player has to play *Candy Crush*. Both Jessie and Jenny played *Candy Crush* as a break from other work, as an engaging and challenging puzzle to spend a small amount of time briefly solving which purchasing power-ups disrupts.

Near the start of our interview when the interviewer asked Brock if he had ever been tempted to cheat at *Candy Crush*, he immediately assumed that we were referring to those legitimately purchased power-ups. He similarly felt that using power-ups took away the appeal of playing; 'just taking a magic toy that gets me through the next level and then I'm like, what did I even do then? What was the point of that? The challenge is gone, the puzzle is

just gone.' To Ash, the player who used the third-party cheat programs, the motivation was different; to compete against his friends and advance through the game and consequently his attitude towards cheats was different. This aside, all these players still felt that purchases of power-ups was cheating in some form. James (61, M) even expressed this attitude towards any type of purchase:

Within the household it's definitely not on to pay . . . and among their [his children] friends who play, it's considered cheating. If you did do it you'd never talk about it!

These quotes have demonstrated the findings from our research that some players consider in-app micro-transactions a form of cheating. In particular, those purchases that afforded an advantage within the game were considered to give players an unfair advantage in competitive play and otherwise take away from the purpose of playing and thus the enjoyment of the game. We also saw this categorization as justification for using complex technical cheats, such as third-party programs. More simple exploits, such as those that afforded unlimited lives, were still considered cheating but were less denigrated; principally because they had no effect on the gameplay. Unsurprisingly, these then appeared to be the most common form of in-game purchase made by our participants.

Discussion and conclusion

Although accurate data is unavailable, it is typically cited that 10 per cent of the players who play 'freemium' games account for 50 per cent of the revenue (Dredge 2011; Rigney 2012). A more recent Swrve report (2014) suggested that only 49 per cent of players make any purchases at all. Those making multiple purchases (totalling over US\$20) contributing the lions' share of revenue are colloquially referred to by developers as 'whales'. Discounting the revenues from in-game advertising, this presents an astonishing conundrum for the social, casual, mobile genre which typically relies on the freemium model: why don't over half of players pay at all? Indeed, as the freemium economy has increased, users in the Apple and Android app stores are increasingly less likely to make outright purchases (Kulyk 2012) in the face of a flooded market of (ostensibly) free games.

It is thus of some significant importance that many players of *Candy Crush*, currently the most successful social, casual, mobile game, consider these IAPs – fundamental to its business model – a form of cheating. Obviously

with its recent IPO valuing the company at US\$7.6 billion (Carey 2014), with a reported US\$1.8 billion in revenue (Villapaz 2014), many feel that payment is an acceptable way to circumvent in-game challenge, but much more could be made if these feelings of cheating could be reduced.

As noted earlier, cheating has been thoroughly explored in game studies. Structuralists (e.g. Suits 1978) sought to define cheating as a violation of a game's formal and definable boundaries, but others claim that such boundaries do not exist. For example, Consalvo (2007) defined it as playful, reflecting the nature of game-spaces as places for experimentation and creative play. We see this common definition having significant rhetorical weight in this study; fair, for *Candy Crush* players is unaltered and the appeal of the puzzle-based game is in beating the challenges fairly. However, this does not explain the categorization of in-game purchases as a form of cheating, as power-ups 'earned' (rather than bought) through gameplay are considered legitimate play.

The circumstances in which we saw the purchase of in-game advantages as acceptable were when the focus of the play was not on the challenge of an individual level, but the challenge of advancing through the game's progression mode. In these circumstances, purchasing an in-game advantage to bypass a particularly hard or challenging level was a more acceptable, but still to many, a form of cheating, as it cheapened the challenge of getting to high levels.

We noted in our research another challenge to *Candy Crush*'s monetization which reflected the significantly low percentage of players making IAPs. While cheating in the form of gaining unlimited lives was attractive to some, as it allowed them to play on their own terms (only 'cheating the candy crush empire'), some felt that learning this cheat had diminished their experience of the game. Rather, they recognized that the limitation of playing was part of its appeal; a reward for waiting 25 minutes to play (perhaps having worked on a hard task in the interim) or as a formalized limit to reduce the impact of *Candy Crush*'s 'addictiveness'. To those with enough self-restraint or aversion to paying money, not paying saw the game more successfully and positively integrate with their daily lives.

Thus here, like in Carter et al. (2014), we attempt not to rely on a definition of cheating; it is not that it is an unfair advantage that in-game power-ups are cheating (earned power-ups are not thought of as cheating). Similarly, they are not a trick (De Paoli and Kerr 2010); no deception or deceit has occurred with power-ups, and they are most certainly not a violation of the game's formal rules. The categorization of IAPs in this context as a form of cheating is best understood as an attempt by players to denigrate the practice as unacceptable because it does not align with their motivations to play; to pass time, as a break from work, overcome a challenge, solve a puzzle or to

relax. In order to achieve these aims the game and challenge must be fair, unaltered and achieved within the game rather than through demonstrations of economic power. Rather than drawing from a specific definition of cheating, the concept is simply being used as a moral resource to devalue this type of play, a devaluation of sincere concern to those who employ this business model. 'Freemium' games should offer players the opportunity to enhance their experience in accordance with their motivations to play and enjoyment drawn, or making IAPs will remain a socially hidden – and thus less successful – business model.

Notes

- 1 This tenant of *Candy Crush Saga*'s design is strikingly similar to another enormously popular casual, mobile game; *Angry Birds*, where Brendan Keogh notes a single input can (with a little luck) be amplified 'into a massive spectacle of destruction' (Keogh 2014: 9). This facet of *Candy Crush Saga*'s gameplay was noted by many of our participants as part of the game's appeal.
- 2 We follow the precedence by Lankoski (2010) in indicating patterns through the use of SMALL CAPS.
- 3 All participants in this study have been assigned and are referred to by unique pseudonyms.

References

- Amano, T. 2013. 'Nexon Seeks U.S. Deals for Free-to-play Model as Consoles Fade'. *Bloomberg*. Available online <http://www.bloomberg.com/news/2013-10-27/nexon-seeks-u-s-deals-for-free-to-play-model-as-consoles-fade.html>.
- Björk, S. and J. Holopainen 2004. *Patterns in Game Design*. Hingham, MA: Charles River Media.
- Carey, D. 2014. 'APAX Poised to Score 10,000% Gain on "Candy Crush" IPO'. *Bloomberg*. Available online <http://www.bloomberg.com/news/2014-03-18/apax-poised-to-score-10-000-gain-on-candy-crush-maker-s-ipo.html>.
- Carter, M. and M. Gibbs. 2013. 'eSports in *EVE Online*: Skullduggery, Fair Play and Acceptability in an Unbounded Competition'. In M. Nelson (ed.), *Proceedings of the 8th International Conference on the Foundations of Digital Games*, 1–8. Crete, Greece: SASDG.
- Carter, M., M. Gibbs and M. Arnold. 2015. 'The Demarcation Problem in Multiplayer Games: Using Boundary-Work to Understand the Development and Disputations of Informal Game Rules in *EVE Online*'s eSport'. *Game Studies*, 15 (1) <http://gamestudies.org/1501/articles/carter>.

- Consalvo, M. 2007. *Cheating: Gaining Advantage in Video Games*. Cambridge, MA: The MIT Press.
- DeLanda, M. 2005. *Intensive Science & Virtual Philosophy*. London: Continuum Press.
- DeLanda, M. 2006. *A New Philosophy of Society: Assemblage Theory and Social Complexity*. London: Continuum Press.
- De Paoli, S. and A. Kerr. 2009. 'The Cheating Assemblage in MMORPGs: Toward a Sociotechnical Description of Cheating'. In B. Atkins, H. Kennedy and T. Krzywinska (eds), *Breaking New Ground: Innovation in Games, Play, Practice and Theory: Proceedings of the 2009 Digital Games Research Association Conference*, 1–12. Utrecht, The Netherlands: DiGRA.
- De Paoli, S. and A. Kerr. 2010. 'The Assemblage of Cheating: How to Study Cheating as Imbroglia in MMORPGs'. *The Fibreculture Journal* 16.
- Dredge, S. 2011. 'Want Freemium Mobile Games Success? Don't Fail to Net the Whales'. *The Guardian*. Available online <http://www.theguardian.com/technology/appsblog/2011/jul/26/freemium-mobile-games-whales>.
- Dredge, S. 2013. 'Candy Crush Saga Publisher King Tipped for Lucrative IPO'. *The Guardian*. Available online <http://www.theguardian.com/technology/appsblog/2013/sep/30/king-ipo-candy-crush-saga>.
- Dumitrica, D. D. 2011. 'An Exploration of Cheating in a Virtual Gaming World'. *Journal of Gaming & Virtual Worlds* 3 (1): 21–36.
- Fahey, M. 2013. 'Infinite Lives in Candy Crush Saga Isn't Cheating, It's Time Travel'. *Kotaku*. Available online <http://kotaku.com/5977630/infinite-lives-in-candy-crush-saga-isnt-cheating-its-time-travel>.
- Glauser, B. and A. Strauss. 1967. *The Discovery of Grounded Theory*. Chicago: Aldine.
- Harrop, M., M. Gibbs and M. Carter 2013. 'Everyone's a Winner at Warhammer 40K (or, at least not a loser)'. In C. Pearce, J. Sharp and H. Kennedy (eds), *DeFragging Game Studies: Proceedings of the 2013 Digital Games Research Association Conference*, 1–11. Atlanta, USA: DiGRA.
- Keogh, B. 2014. 'Paying Attention to Angry Birds: Rearticulating Hybrid Worlds and Embodied Play Through Casual iPhone Games'. In L. Hjorth and G. Goggin (eds), *The Routledge Companion to Mobile Media*, 267–75. New York: Routledge.
- Kulyk, K. 2012. 'Opinion: Why We Chose Freemium'. *Gamasutra*. Available online http://www.gamasutra.com/view/news/175092/Opinion_Why_we_chose_Freemium.php.
- Lankoski, P. 2010. *Character-Driven Game Design – A Design Approach and Its Foundations in Character Engagement*, [D.A. thesis at Aalto University]. Publication Series of the School of Art and Design A 101.
- Linderöth, J., S. Björk and C. Olsson. 2012. 'Should I Stay or Should I Go? Boundary Maintaining Mechanisms in Left 4 Dead 2'. In O. Sotamaa and F. Mäyrä (eds), *Proceedings of the 2012 Nordic DiGRA Conference*, 1–14. Tampere, Finland: DiGRA.
- Powell, A. and D. Williams. 1999. *Neopets* [online game]. London: Jumpstart.
- Rigney, R. (2012). 'These Guys' \$5k Spending Sprees Keep Your Games Free to Play'. *Wired*. Available online <http://www.wired.com/gamelife/2012/11/meet-the-whales/all/>.

- Sarkar, S. 2014. 'European Union Meeting with Apple, Google, Others on In-app Purchase Concerns'. *Polygon*. Available online <http://www.polygon.com/2014/2/27/5454574/european-union-in-app-purchases-free-to-play-concerns-meeting-apple-google>.
- Shanley, M. 2013. 'Hooked on Candy Crush? King Gets Gameplayers to Pay'. *Reuters*. Available online <http://www.reuters.com/article/2013/10/08/us-sweden-gaming-idUSBRE99704F20131008>.
- Smith, J. H. 2004. 'Playing Dirty – Understanding Conflicts in Multiplayer Games'. In *Proceedings of the 5th Annual Conference of the Association of Internet Researchers*, 19–22. UK: University of Sussex.
- Suits, B. 1978. *The Grasshopper: Games, Life and Utopia*. Ontario, Canada: Broadview Press.
- Swrve. 2014. *Swrve Monetization Report for January 2014*. San Francisco, CA: Swrve.
- Villapaz, L. 2014. 'King Files \$500 Million IPO: "Candy Crush Saga" Creators May Face Several Risks in Volatile Mobile Free-To-Play Market'. *International Business Times*. Available online <http://www.ibtimes.com/king-files-500-million-ipo-candy-crush-saga-creators-may-face-several-risks-volatile-mobile-free>.
- Woodford, D. 2013. 'Dispute Resolution Across Platforms: Offshore Gambling Industry and *EVE Online*'. In M. Carter, D. Woodford and K. Bergstrom (eds), *Proceedings of the 1st International EVE Online Workshop at the 8th International Foundations of Digital Games Conference*, 39–46. Crete, Greece: SASDG.
- Zagal, J., S. Björk and C. Lewis. 2013. 'Dark Patterns in Game Design'. In M. Nelson (ed.), *Proceedings of the 8th International Conference on the Foundations of Digital Games*, 39–46. Crete, Greece: SASDG.