A Sense of Belonging: Pokémon GO and Social Connectedness

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ABSTRACT

The free-to-play mobile game Pokémon GO's use of real-world mapping encourages play in public spaces, opening up the possibility of greater engagement with other players, local communities and surrounds. This study conducted a series of interviews (*N*=15), and collected online social forum reports of gameplay (*N*=880), in order to determine what the social outcomes of play may be, and what mechanisms might be facilitating social connectedness. Thematic analysis revealed that playing PGO produced a sense of belonging, linked to a sense of place, as well as facilitating conversations with strangers, and strengthening social ties. This was due to the use of accessible technology able to be integrated into daily routines; shared passion for the

game; and mechanics that encouraged players out of their homes. 'Shared passion' was tied to the nostalgic connection many players felt for the franchise. This study shows how gameplay can build social connectedness through real-world engagement.

KEYWORDS

INTRODUCTION

Pokémon GO (hereafter referred to as PGO), is a free-to-play location-based augmented reality (AR) mobile game that uses the global positioning system (GPS) on a player's mobile phone to map game features over their local area. It was released by Niantic in June 2016 and quickly became a social phenomenon with over 100 million downloads by early August 2016 (Google Play market only, Soko Media, 2016). It is the first AR game in a franchise that began in 1996. Gameplay entails the collection of items from PokéStops (virtual landmarks superimposed over players' local geography), capturing Pokémon (creatures with varying abilities), and competitive battle between the three in-game factions, or "teams", at gyms (virtual battle arenas located in public spaces). Players can also obtain new Pokémon by walking specific distances to hatch eggs, and use items such as "lures" to increase the chance of Pokémon appearing at their chosen PokéStop. As such, players are rewarded for physical movement and inhabiting public spaces. In addition, a Pokémon that appears at a certain location is visible to all

2

players in that area so that players have a shared sense of the game world.

While there is some evidence that play of PGO might positively impact on the level of physical activity players engage in (Althoff, White, & Horvitz, 2016), an unexplored outcome of real world play may be improvements in social connectedness. Social connectedness can take many forms: intimate partnerships, relationships with family or friends, or a sense of belonging to a larger community (Stavrova & Luhmann, 2016). It seems likely social connectedness may be facilitated by gameplay that draws players into public spaces, and which is integrated into players' everyday lives and relationships. A sense of belonging, as may be generated by engagement in community activity, is also positively related to both social support and psychological functioning (Hagerty, Williams, Coyne, & Early, 1996), while relationship satisfaction negatively predicts loneliness (Hawkley, Browne, & Cacioppo, 2005). As such, playing PGO may have a two-fold positive effect on the players' lifespan as both sedentary lifestyles and social isolation have been found to increase morbidity (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015; World Health Organisation, 2016). Therefore, understanding if and how playing PGO leads to greater social connectedness has implications for the design of both persuasive and recreational technologies, as well as for the design of health and wellbeing interventions.

The current study sits within a larger program of research concerned with building health and wellbeing as well as social connectedness via playful technology, the [removed for blind

3

review]. By focusing on the adoption of a popular recreational game we seek to better understand what aspects of geo-mapped game play might foster social connectedness, and in doing so, identify how other technologies might leverage these to motivate engagement.

The Motivation to Play

Social connectedness has benefits beyond the immediate enjoyment of social interaction. This is demonstrated by social isolation greatly increasing the risks of morbidity (by 29% - (Holt-Lunstad, et al., 2015). As such, motivating social connection may be key to influencing the health of whole populations, especially when delivered via readily accessible technology. Self-Determination Theory (SDT) provides a comprehensive map of the processes underlying human motivation. Specifically, for an activity to become intrinsically motivating, it should provide opportunities for the satisfaction of the psychological needs for autonomy, competence and relatedness (Ryan & Deci, 2000). Relatedness refers to a psychological need to feel cared for and to provide that in turn (Deci & Ryan, 2000). As such, it can be seen as motivating various forms of social connectedness, including that achieved through social games and applications. For example, the social motivation to play is central among players of Massively Multiplayer Online games (MMOs - Yee, 2006), and the experience of relatedness can motivate the intention to play again (Ryan, Rigby, & Przybylski, 2006), as well as persistence with both casual and heavy gameplay (Neys, Jansz, & Tan, 2014). However, social connectedness has been shown to be fostered via nostalgia (Cheung et al., 2013).

4

Nostalgia is characterized by a fond emotional connection with past events and relationships – making possible the accessing of "positive relational knowledge structures" (Wildschut, Sedikides, Arndt, & Routledge, 2006, p. 990). As such, nostalgia can counteract weak perceived bonds with others by establishing a symbolic link to significant others (Sedikides, Wildschut, & Baden, 2004), thus reducing loneliness (Zhou, Sedikides, Wildschut, & Gao, 2008). With 46% of PGO players being between the ages of 18 to 25 years (Sonders, 2016), a large percentage of the players may have grown up playing and/or watching Pokémon media. Interestingly, a recent survey of PGO players found that a greater nostalgic motivation to play the game predicted greater loneliness, suggesting this may be due to the 'backwards-looking' nature of nostalgia (Yang & Liu, 2017). However, the same study also found a strong correlation between nostalgia and both friendship maintenance and relationship initiation. It seems likely that nostalgia, by representing both symbolic and real attachments with others, provides a useful lens to understand how connection can result from play.

When considering a game such as PGO, it is also worth exploring the notion of 'casual games' – and how play comes to be integrated into the lives and relationships of players. Casual games are commonly defined by their design: quick rewards; readily learnt; and, short play sessions (Kuittinen, Kultima, Niemel, & Paavilainen, 2007). While casual games typically present white characters, non-sexualised female characters are used more in casual games than they are in other forms of videogame (Wohn, 2011), suggesting greater gender parity amongst

5

players. The lack of demand that casual games make on players' time, attention, or money may make them appealing to a wider range of people and more easily accessible (Kuittinen, et al., 2007). For example, players can integrate casual gameplay with other low-attention demanding tasks as they are able to quickly suspend gameplay when more demanding situations arise (Kultima, 2009). Of interest to this study is whether play that is integrated into players' everyday live opens up the possibility of wider social networks in the real world.

Real-world Play

Research into the use of public space has found that the social and physical are almost impossible to separate (Van Hecke et al., 2016). As such, interactions, or lack thereof, in public spaces are indicators of broader concepts of community and belonging. PGO uses a dataset of geo-tagged landmarks (developed by the game *Ingress*) to encourage players' interaction with real-world landmarks. This, combined with the use of mobile phone GPS technology and AR, creates an accessible means to play in, and connect with, public spaces. How this might impact on players' sense of belongingness to the wider community (including non-players), is yet to be established. However, it is worth noting that play in public spaces operates on different social terms to those of online spaces, given the potential for a lack of separation from players' everyday lives, in which play can occur while commuting, working, and in one's locale. Additionally, public spaces can host populations which are viewed with distrust, or consider themselves to be at risk of being targeted (Crane & Dee, 2001). As such, the use of these public

spaces in game play can be both disruptive and transformative. Just as the claiming of public parks by migrants playing soccer can act to build community and redefine public space (Quiroz Becerra, 2014), so too may the play of AR games in public spaces.

The overlap of online and offline communities may also provide PGO fans with opportunity to physically meet up with people who share a passion for the same cultural product. A study of offline meet-ups amongst an online community of science fiction fans found that real-world meet-ups increased the bonding social capital of participants (Shen & Cage, 2013). However, Yang and Liu (2017) found that playing PGO in order to meet people was positively associated with both loneliness and bridging social capital. As their study did not measure at multiple time-points, it is not possible to know if loneliness was a motivating force, nor to know if these players were able to move beyond the weak ties created through play. Regardless, it does demonstrate that just as MMOs can provide social affordances (Crenshaw & Nardi, 2016) – or a platform for social connectedness – so too may AR games. As such, PGO may well bring social games full circle by transposing the virtual 'third places' of MMO play (Steinkuehler & Williams, 2006) – places other than work or home in which informal social interaction can occur – back into the real world.

Finally, given our social world is no longer necessarily bound by geography or the locales where people live (Wellman, 2001), it is worth considering how AR and geo-mapped technologies can reinforce a relationship to place. Proshansky and colleagues (1983) describe

7

how a component of self-identity is comprised of ever-changing cognitions about the physical locale in which we live – a 'place identity' that contributes to a psychologically healthy sense of self. In this sense, the physical world becomes the embodiment of the individual's memories, experiences, ideas and the values built up over time and in place. In turn, the opportunity to linger and engage in casual encounters, which public spaces provide, can lead to reductions in stress, and feelings of safety and inclusion (Cattell, Dines, Gesler, & Curtis, 2008). This suggests that new technologies, which encourage lingering in local public spaces, might promote health and wellbeing through the development of a sense of belonging, both to others and to place. In addition, the everyday-ness of the encounters that build a connection to place implies the usefulness of technologies that are mobile, readily accessible and discreet. Mobile phone technology is uniquely well-positioned to act as an intermediary between gameplay and the physical world. Whether PGO is enabling this level of social outcome, however, is yet to be determined.

The Current Study

The current study interviewed a small number of PGO players and analysed a large volume of online social forum posts in order to understand the user experience of playing PGO, and what social experiences players might be having. It has been established that social connection via gameplay is a major part of the appeal of certain games (Crenshaw & Nardi, 2016; Steinkuehler & Williams, 2006; Yee, 2006). Additionally, PGO's integration with real-

8

world landmarks suggests that some of these connections may be facilitated by public spaces (Cattell, et al., 2008), and even contribute to a broader sense of 'place identity' (Proshansky, et al., 1983). This opens up the possibility of interactions with strangers in an offline and localised environment, as well as play with family and friends. To determine the form that these connections may take, this study asks:

RQ1: What are the social outcomes of playing PGO?

While there are numerous broad motivators of video game play, such as those covered by SDT (Ryan & Deci, 2000), it seems likely that just as certain MMO games provide different forms of social affordance (Crenshaw & Nardi, 2016), there are specific aspects of the game or gameplay that promote the social outcomes PGO produces. Thus, our second question:

RQ2: How does PGO facilitate social connectedness?

METHOD

Ethical approval was sought and granted by a university ethics committee prior to commencement of the study. Qualitative methods were employed, which included: a series of face-to-face interviews (N=15) held in public spaces adjacent PokéStops in a single urban environment; and, the collection of data from a large number of posts, from a global population via an online social forum.

Data Collection

Interviews

Participants seen standing close to PokéStops were approached and asked if they were currently playing PGO, and if they would like to take part in an interview about their game play. Participants who agreed were led to an outdoor table and chairs, provided with written information about the study, and asked to provide written consent prior to the audio-recorded interview commencing. Inclusion criteria required that they be aged 17 years and above. All participants were reimbursed AU$20 for their time. Interviews took place between the 3rd to 7th August, 2016. All interviews were transcribed and all identifying information removed.

Online social forum posts

While the interviews were collected in one city, the forum posts were chosen from a global, if primarily English-speaking sample, by consulting a popular online social forum: https://www.reddit.com/r/pokemongo/. On Reddit, it is possible to categorise posts according to their content via a tagging system, known as "flairs". On r/pokemongo, the available flairs at the time of data collection were Art, Discussion, Humor, Media, Questions, and Stories. To narrow the search to the most relevant content, posts were filtered according to the flair "Stories" and collected into one document by one of the researchers. It should be noted that the Stories flair may showcase more dramatic experiences, as users have the option to up-vote stories that appeal

to them, and so contributions may be written to elicit this response. All stories that were posted between 22nd July to 29th September, 2016 were collected, numbered and analysed (N=880).

Participants

The interviewed participants (N=15) were aged between 17 to 31 years (M=23.27 years, SD=4.18), 60% male, 40% female. They were asked to rate their general level of experience with video game play from one to ten, with one being very low and ten being very high. Self-perceived level of experience with video game play was high (M=7.8, SD=1.52). Eighty percent of the participants reported having played other Pokémon games. See Table 1 for additional detail. No such information is available for the contributors of the online social forum posts.

Table 1. Interview participant's descriptive information

ID	Age	Gender	PGO Level	Plays with:
1	24	male	21	friends, brothers
2	28	male	20	no one, talks about it with friend
3	18	male	19	friends
4	24	female	16	brothers
5	18	female	13	boyfriend, sister, father
6	21	male	18	friends, brother
7	22	male	11	friends
8	25	female	15	friends, brother, cousin
9	26	male	19	wife, friends, co-workers
10	24	male	17	friends, siblings and their children
11	31	female	20	no one

12	17	male	10	friends, brother
13	27	female	21	friends
14	18	female	21	friends, siblings, father, mother
15	26	male	19	friends, co-workers

Measures

Semi-structured interviews were conducted and when necessary, follow-up questions were asked for greater clarification and understanding. Broadly, the questions probed players' social play experiences, for example: who they played with; if they talked to any strangers about PGO in passing; did they play with family and friends; if they felt more engaged with their community; what kinds of conversation they were having with other players online and offline; and, whether any social interactions they engaged in while playing were different to their usual behaviours. The interviews varied in length, ranging from 13.80 to 34.42 minutes (M=19.53 minutes, SD=5.24 minutes).

Analytic Strategy

Thematic analysis of both the interviews and online social forum posts followed the process outlined by Braun and Clarke (2006), that is: data familiarisation; the generation of initial codes; identifying broader themes; theme review; theme definition; and, reporting. The interviews were analysed first. An iterative process using two coders was conducted in order to cross-check the interpretation of the data and develop definitions that were both consistent with

the data and internally coherent. Specifically, two researchers coded one interview independently (using NVivo), discussed the resultant themes and relationships between them, and developed an initial thematic structure. They then re-coded this interview and additional interviews independently, and created a shared document in which new themes could be discussed. The addition of new themes necessitated repeat 'sweeps' of already coded interviews, and repeated discussion until all the interviews were coded and all themes were resolved.

In relation to the online social forum posts, due to the significantly larger amount of data collected, 100 posts were randomly selected (25 from each quartile, to ensure an even spread across the entire date range) and coded used the techniques described above. In addition, text searches were conducted across the entire sample that used words corresponding to the various themes established in the thematic analysis of the interviews, for example 'community', 'friend' and 'collect'. The use of both coding and text searches, allowed us to see if additional themes emerged from the use of a global sample (coding), as well as gain richer detail to inform the interview codes (text search).

All excerpts from interviews and online social forum posts are reproduced verbatim. Abbreviations include: -- indicates a pause; 'Q' indicates the interviewer's question; and ... is used to indicate a less relevant part of the quote has been removed. Interview participants are indicated by 'P' (e.g. P1), while forum posts are indicated by #, followed by the date of the post (e.g. #345, 8 August 2016).

RESULTS

The same themes that were produced by the interviews emerged in the coding of the forum posts, with no additions. However, the latter produced additional insights reflecting the global nature of the sample, and its point of collection (online forum).

Social Outcomes

In answer to RQ1, three main themes emerged. Players of PGO reported *Strengthened Ties* with family and friends. They also reported that the game acted as an *Icebreaker*, facilitating conversations and interactions with strangers. Furthermore, by playing and meeting fellow players in offline meet-ups in public spaces, players reported a *Sense of Belonging* through both a connection to other players in their locale, and connection to place.

Strengthened ties

Over 90% of interviewees reported that they played PGO with family and friends. In many cases, PGO was incorporated into their routine social activities with them:

> … 'cause we're family it's just we all got into it at the same time and then we can just go around whenever we feel like it together. – P1

> ... so, instead of just hanging out, we're actually just going to go get Pokémon instead. And just, we will, you know, screw dinner or whatever; let's just go Pokémon hunting -

14

P9

However, in other cases participants reported spending time with a broader group of family members that they may not have otherwise spent time with, and in some cases also engaging in cross-generational play:

> I don't know, it was just kind of weird because it was my older brothers and sisters who are like 10, 15 years older than I am and then their kids as well ... It was kinda cool that we were playing with everybody. - P10

> ... he's stopped playing with me because he's Aspergers and he doesn't like any form of competitiveness ... So, with this game where there's being no competitive aspect, it's really nice to be on an even field the whole time … normally we just drive down to the beach and walk up and down the beach together, catching Pokémon. - P12

Additionally, playing PGO led to changes in how much time family and friends spent together and to greater enjoyment of each other's company:

> I've been meeting up with my brother heaps. …
> *Q: Is that how you would normally spend time with him?*
> No. To be honest, I only spend time with my brother like once every three months, which is bad. - P4

Thanks to PoGo my relationship with my dad has drastically improved. We used to have really short talk + life advice and stuff due to me being grown-upish, but ever since he got into Pogo (we're both lv 24; he's even ahead of me lol) we talk way more (about the game), go out from a few mins to a few hours depending on the current situation to catch some pokémon (work, stocking goods, family reunions, ...) and even share our feats! … I was really excited to re-introduce him to Gen 1 (he watched with me sometimes when I was a kid) - #126, 30 August, 2016

My mother was a very conservative Chinese lady, and though she loved me, she never understood my passion for gaming ... When PokemonGo came around, she was unusually interested in it. I wasn't sure if it was the massive popularity or the nostalgic familiarity that got her, but I saw the chance and took it immediately. Downloaded it into her phone, and taught her how to play. She has now walked over 100 miles (improving her health immensely), learned proper English and made three friends (she had none), found a Porygon spawning spot in our small city (people cheered for her) ... Thanks, PokemonGo, and the community, for giving my mother the chance to understand how wonderful games can be, and for bringing us closer than we ever thought possible. - #516, 7 August, 2016

Icebreaker: facilitating conversation

In addition to influencing existing social ties, PGO players also reported gameplay acting

16

as an icebreaker, facilitating casual conversation with strangers (over 85% of the interviewees reported this). Typically, this began with discussing gameplay mechanics regarding the types of Pokémon in the area:

> So I went over there and then I saw these like two guys sitting on a table and they were quite big, and I was like, "Oh, god." I was a bit afraid of them. And then when I sat down next to them and then this guy was just like really happy to see me, like, "Hey, what kind of Pokémon'd you caught?" - P4

> … it wasn't weird to just go up to someone and talk to them about it. Everyone was onboard and helping each other catch these Pokémon. - P15

> ... I see other dudes like me, super shy, socially awkward, and we both give each other that "awkward glance" as we walk past each other looking for Pokémon at the park. We'll pass each other a few times, and then one of us will eventually start up a conversation, like "Hey man, have you seen that nearby Staryu anywhere? I can't find it". - #638, 27 July 2016

While for some participants talking to strangers was not an unusual behaviour, in some cases it led to interactions that were out of the normal, and conversations took place about non-game related subjects:

> ... like I said before, I would never in a million years dream with hanging out and you're

17

just talking about stuff like I'm -- like I might talk about my dogs and talking about my pets and animals and my moving and moving from this area ... you wouldn't have these conversations with strangers normally. - P9

Both team rivalry and affiliation also seemed to spark new interactions:

The two lads must have been about twelve years old. They'd been lurking … before they plucked up the courage to talk to me.

… we'll be back later to take this gym back … If you can manage to take it down.

As they started walking away I shouted back

Well I'll take it back after your bedtime. - #207, 21 August, 2016

I went to a park near my place today where a lot of people go to play Pokemon GO and there was a kid that I ran into. He was probably fourteen or fifteen, and he saw that I was playing it too and he got so excited. I asked him if he was on the same team as me and he was and he got even more excited … Then he asked me if I wanted to go take down a gym with him and I told him, "Sure, why not?" And so we headed over to a gym to try and take it down ... He didn't really know how to communicate with other people very well, but enthusiasm was just oozing out of him. - #551, 6 August, 2016

Sense of belonging

More broadly, players formed a sense of belonging via gameplay that was expressed in terms of feeling part of a community of players inhabiting both online and offline spaces. Within public spaces, this was expressed as an enjoyment of sharing the game with large numbers of other players:

> … it's brought the community together in my home town, at least, because you'll see lots of people congregating around gyms or PokéStops and things like that. - P3

> My town didn't get the luck of having 100 pokestops per inch and the only place we had was in a public park with 5 pokestops so that where the meeting was set, I didn't expect much but when I arrived I saw lures in all pokestops, kids with their parents, adults walking the dog playing, a lot of teenages. - #505, 7 August, 2016

Online communities also made efforts to meet up to play, which reinforced a sense of being a part of something large:

> ... there's just been Facebooks of, like, Pokémon walk, Pokémon get-togethers and like the first time that they had launched that, I walked with a -- like over 400 people across the T bridge that leads to S. And I took a photo of it and oh my gosh, it was amazing. - P14

For some players, this created altruistic play behaviours and/or a sense of social cohesion and social goal:

> If I see like an area that has a couple lures ... I can always add one to it ... it's almost Communist, like everyone's working for the same goal, like, you know, equality for all. So I've got to do my bit. - P9

> It was a lot of fun a Lapras spawned so everyone went looking for it and when a kid found it everyone rushed to catch it, I've never seen people working together like that its a lot of fun to see it... - #505, 7 August, 2016

While not unique to PGO, the social support provided by online PGO communities also fostered a sense of belonging:

> After spending 11 days in the ICU, I finally got released from the hospital … Thank you to everyone who wished me well while I was in the hospital. It helped me smile during a really trying time in my life. This community is awesome and I am so proud to be a part of it. - #179, 24 August, 2016

The online forum also provided a means to share recommendations on how to play safely – a form of mentorship of fellow players with a view to influence or improve the community as a whole, e.g. "Be careful out there guys… me and mom go looking for virtual ekans and find a real one instead. It was a copperhead" (#811, 22 July, 2016). The sense of community and trust in

others was also extended to people from very different backgrounds and social milieus. This is built on a shared passion for the game, and not always with the safe distance of online interactions:

> On Saturday I went for a walk along a local river ... Every second person was playing GO. I stopped by a group of men defending a gym ... They were obviously Pokemon die-hards, and had been part of the franchise since they were young. They were also fairly rough types, sporting cigarettes and ratty hoodies. As a young woman, I would have crossed the street to avoid them under ordinary circumstances. - #755, 24 July 2016

For some, the social and physical aspects of belonging overlapped, as play generated both a sense of connection to other players and to place. Connection to place was enacted through nostalgic recollection, as players reconnected with their local geography:

> I had no idea there was such an awesome kids park in the middle of the botanic gardens. I had no clue … I used to go there a lot when I was very young, there used to be all these trees you'd climb and things like that and now it's all different. - P11

For others, place was paired with the emotional experience of connection to other players:

> It was such an amazing atmosphere down by the river that night. I got to experience first-hand the unity that this app brings about. - #755, 24 July 2016

Facilitators of Social Connectedness

In answer to RQ2 'How is PGO encouraging social connectedness?', players engaged in social interactions when they were encouraged to *play outside*. This was further facilitated by the *accessibility and integration* of the game into their everyday lives, and via a sense of *shared passion* for the game.

Play outside

Due to the geo-mapped features of the game, and rewarding physical movement, players were encouraged to leave their homes. Playing outside opened the possibility of exploration and discovery, which could in turn provide the foundations for building a sense of belonging:

> ...the part that drew me to the game most is like, you know, you kind of act like a tourist in your own town, yeah. - P11

> There's a park near my place I have never gone. I never ventured out. And then I was like, "Oh, there's a PokéStop there. So, why not?" - P4

In turn, sharing these experiences with family and friends in a different setting to normal may have led to 'strengthened ties' by expanding the terms of their relationship:

> I don't usually go out. And once I get home I'll just go into my room and just close myself in. But then my housemate started playing as well. And we'd actually go out and

22

hang out. - P4

Being outside was described in terms of its overall social value – one which overwrote the narrative of the socially-isolated video game player, with one that was perceived as being both physically and socially healthy:

> I know there's a lot of people who feel isolated, especially people who play video games. It can be quite an isolating hobby. But it's getting people out and about and that's not a bad thing ... don't get out as much as I like and it's getting me outside, even if it's to hatch some eggs or even if it's just to do a PokéStop tour. - P9

> I certainly feel more positive because generally I feel like, yeah, I'm getting out, I'm having a benefit for that because not only is it a game, but, yeah, it's encouraging people to get out, have fun, meet up with other people, trust, yeah. - P14

Notably, for some, PGO motivating them to 'play outside' was a dramatic change from their normal behaviour, challenging both their physical abilities and their social anxiety. It seems that just experiencing the potential for 'icebreaker' moments was both a real hurdle and a source of pride for the more socially anxious players:

> Like some other Pokemon GO players, before the game came out I was a total couch potato, but not just any couch potato – a 150kg one, with no friends to speak of and as such no real reason to go outside except for work or shopping ... I was so focused on

23

tracking new pokemon/somehow getting to the lake that I didn't mind at all –– which is pretty rare because I usually always fear what other people think of me. ... I really hope that the game gets better and better in the next few months so it continues to drive me out of my shell and house ... - #446, 10 August, 2016

For the last 10+ years I have suffered from a crippling anxiety problem. Going places is very challenging … Along came Pokemon Go…learned there some very active spots where 1000s of Pokemon players congregate… Not going to lie. First several visits were hell. … But, the lure and distraction of the game helped and over the last month the trips have become easier and easier. Now I get up every morning and go to places that if someone had asked me to visit a month ago I would have made up any excuse/lie to get out of going. - #213, 21 August, 2016

However, for players in cities with high-levels of crime, playing outside was severely compromised:

I live in a country where … you don't even have to enter a no-go area to be in danger of encountering a thug ... I play most of the time in my car, because I'm afraid to walk with my smartphone and lose it to a thug … I won't be able to make full use of the new buddy system, because it'll not be possible to be walking all the time on the streets. #79, 9 September, 2016

24

Accessibility and integration

The degree to which players could integrate play into their everyday lives directly impacted on the range of social connections players could make during play. This was facilitated, first and foremost, by the convenience of playing the game on readily accessible technology:

> I like that you can just basically incorporate it into your everyday life. You don't really need any additional software or hardware or anything. - P2

> … it's something I can play when I'm doing other things, so -- because I don't have a lot of time to delve into video games, so it's just something I can play in the background, doing everyday tasks. - P5

In addition, game mechanics allowed players to gain items easily and at no expense to themselves. For example, lures led to players congregating in public spaces, "… 'cause you can just grab multiple lures at the same time in one spot" (P1). Additionally, gameplay could be conveniently incorporated into players' everyday routines. This took two forms: play that occurred during gap moments, such as while waiting for public transport, or synchronous play, in which players engaged in two activities at once. This meant that play often occurred in places that players typically inhabited, opening up the possibility of 'icebreakers' with people in their local area:

> … it's something I can do when I'm walking the dog, it's something I can do when I'm

walking to the gym. - P9

… if I have a lecture at 1pm to 2pm and then a break an hour before another lecture, within that one hour I'll just come out and have a walk. Before Pokémon came out I actually like just sat down ... But now it's good. It's going out, seeing the sun for a while. - P4

The ease to which play could be incorporated into routines also made it more likely that they could play with a range of people, such as multiple generations of the one family, work colleagues, strangers, and people who would not typically play games:

… the way I work with my manager, we get a lot of our work done first thing anyway ... we can go around the centre. And I've found a few relatively rare Pokémon just wandering around the centre on breaks, so just having 10 minutes here and there. - P9

One night I went to drop my -- pick my sister up from my friend's house and we all ended up getting in my car and collecting Pokémon for another two hours. - P5

While some towns deliberately sought to enhance accessibility to the game, e.g. "My town added wifi to all of the parks, for free, because of Pokemon go" (#120, 1 September, 2016), other players were compromised by the fewer Pokéstops and Pokémon available to rural players:

I just felt the unfair treatment of Niantic to rural players hitting me like a train … I knew

26

that it was different to play in the cities but I did not know it was that different. #230, 19 August, 2016

Shared passion

A desire to share the game with family and friends formed a key motivation for many to play the game:

> ... because I stopped at a certain level because nobody was playing it with me, and because my brother got into it and showed me like a few, like, new tricks and stuff about the game, so I was like, "Okay, I'm going back into the game." - P4

> I'm playing more, actually. Yeah.
> *Q: Why is that?*
> Because I have now convinced my boyfriend to play it with me. And he's convinced his best friend to play it and my brother's now playing. - P4

In terms of weaker ties, sharing passion became a means of building a stronger relationship:

> True story: my manager told me it was on the app store the day it was released and we just downloaded it there and then … she loves it just as much as I do. We compare what we've found from the night before or from the weekend before. It's actually a nice thing just to relate to my manager with ... - P9

Shared passion for the game was most evident in the long-term fans of the franchise:

> … there's people who've supported Pokémon for, like say, the 20 years it's been out now and they're still just as huge fans as they were 20 years ago. So it's kind of connected a little bit more with them ... especially because it's the first generation of the game. And that was my whole thing. I loved the first Pokémon. - P15

It seems likely that a bedrock of previously shared experiences with family and friends underlies the passion that many fans feel for the game:

> It make me sad to think that those amazing times I had with my family are in the past. They're in the same place as the nostalgic memories I have of playing Red/Blue with my brother when we were kids. #326, 15 August 2016

> ... A gangly father was taking his three-year-old daughter for a walk, "Ducky, ducky, ducky!" She babbled at his screen. "Okay, I'll catch the Cyberduck - I mean the Cyduck." ... I walked away smiling at the thought that one of the girl's earliest memories might be catching Pokemon with her Dad. #755, 24 July 2016

The desire to share the experience of play also extended to game recommendations:

> Battling against friends: that would be a cool feature - P14

> … if they added a mechanic where you could play against other players, like personally,

one on one, I think I'd definitely play a lot more - P3

Finally, a large number of stories in the forum posts (29 out of the 100 posts coded) described catching or failing to catch Pokémon. This suggests that the people posting anticipated that the reader would understand the excitement, disappointment or satisfaction that they experienced in the pursuit of Pokémon, due to a shared passion and knowledge of the game.

DISCUSSION

This study identified that playing Pokémon GO (PGO) resulted in a sense of belonging, facilitated conversations between strangers and strengthened ties between family and friends (RQ1), illustrating how positive social outcomes might be enhanced and created in other geo-mapped games or playful spatial interventions. While these outcomes relied heavily on game mechanics that got players out of the house and into public spaces, these effects were unlikely to have been as systemic without the accessibility of the technology and gameplay, or the enjoyment players took in sharing their passion for the game with others (RQ2).

By positioning play as an outdoor activity, PGO offered a means to strengthen established relationships by providing new settings in which to share a passion for play. In some cases, this brought a new appreciation and depth to these relationships, which in turn may have helped them see their local area in a new light, and make them more aware of their everyday surroundings. It also seems likely that stronger social connections were produced in some of the

29

online-to-offline meet-ups, as other research demonstrates (Shen & Cage, 2013). This suggests that games and apps seeking to facilitate social connectedness could use broadly accessible mechanics to encourage people into new physical spaces.

PGO's low price of admission meant most people in the Western world could readily access the technology, learn how to use it and play in a way that rarely disrupted other aspects of life – all of which aligns with definitions of casual gameplay (Kuittinen, et al., 2007; Kultima, 2009). Due to the routines and obligations of most players, this in turn meant playing with others within their immediate vicinity or social structures. Thus, much like MMO play (Crenshaw & Nardi, 2016; Steinkuehler & Williams, 2006; Yee, 2006), PGO became another means with which to maintain and build on established relationships, albeit more geographically-localised ones. However, the ready adoption of multi-generational play was facilitated by casual game mechanics, capturing players with varying levels of time commitment (Kultima, 2009), allowing them to integrate play into everyday life. This, as well as cultural values that associate time outside as 'healthy', may position real world game play as a valuable activity for families to share.

The requirement to play outside also led, in some cases, to changed social behaviours. This highlights the potential role of games and gamified applications in the lives of people experiencing social isolation. The mechanics of having to track and collect Pokémon in the real world led to players overcoming barriers to social connection (e.g. physical isolation due to

social anxiety) and at the same time provided a means of connecting to others (shared passion, potentially facilitating conversation). While other research finds that the motivation to play PGO in order to strike up new friendships is associated with poor outcomes (Yang & Liu, 2017), this research suggests that the motivation to strike up new friendships is not necessarily what is driving socially anxious players to play PGO. Rather it is the inescapable game mechanic of having to play outside, combined with their passion for the game, that draws them into unpredictable social spaces (an experience they can then share with an online community). This was apparent from the online social forum posts in which some players spoke of PGO as a motivational tool that brought them back into public spaces. Whether these players persist in socially and/or physically challenging themselves may depend on the degree to which game activities are tied to positive social connections, supported by research finding persistence in casual play tied to experiences of relatedness (Neys, et al., 2014). Also, although sharing moving stories may be influenced by the desire to gain up-votes, it is also likely that these were significant experiences that were being shared, for some players through the only avenue available. Further research could consider how online forums act as a point of connection for socially anxious players, and a means of data collection, as it is unlikely these stories would be captured using face-to-face interview techniques.

Both the interviews and online social forum posts support the notion of the development of a sense of belonging resulting from people playing PGO in public spaces, and broadly, the

building of social connectedness. The forum posts however, uniquely provided insight into the actual content of what players are sharing with each other (stories of conquest and failure; warnings and advice), as well as providing a global overview of how the game was being played. The forum may also have provided a sense of belonging when playing outside was not encouraged – such as was the case for players in both rural and high-crime urban environments, albeit for very different reasons. As such the real-world constraints and affordances of different locations impact on the level of social connectedness available to players, by discouraging or encouraging lingering in public spaces (Cattell, et al., 2008). The need for further research into the geographic specificities of real-world play is indicated.

The memorable moments players reported when talking with strangers, engaging in mass events, and deepening relationships with family and friends demonstrate how real-world casual games might create emotionally impactful and meaningful play. Yet the shared passion for play that drove many of these experiences would not have been as impactful without Pokémon's mass appeal, and the nostalgic connection many players felt for a game they had been playing since childhood. Thus, while 'shared passion' in the present may derive from the drive to experience the psychological need for relatedness (Ryan & Deci, 2000), PGO also channels a warm sense of connection to players' pasts in which memories of both the game and sharing a passion for the game with close others, are intertwined. As such, this study demonstrates that the nostalgia many players felt for the Pokémon franchise - drawn from past experiences of social connectedness

32

during play, or simply a time associated with positive relationships - fostered a sense of connection with other players in the present, as is described in other research (Cheung, et al., 2013; Wildschut, et al., 2006). While this study largely accessed contributions from adult participants (suspected in the forum posts; confirmed in the interviews), it is not possible to know if a younger generation of players is experiencing nostalgia, or if they are simply building memories to be accessed as adults. Longitudinal research that tracks the experiences of the younger players into adulthood, or cross-generational research, would provide valuable insights. Further research could also consider how online forums act as communal repositories of game experiences, unavailable to other data collection techniques.

It also seems likely that the play of PGO is in turn producing memories for future recollection that are tied to physical places and feelings of belonging. This in turn would directly contribute to the on-going formation of a place identity (Proshansky, et al., 1983), as well as to a desire to further share these experiences with others. For individuals and communities who typically feel excluded from public spaces (Crane & Dee, 2001), or find them challenging to inhabit, this may be especially impactful. As this franchise ages and produces further iterations, it will be interesting to note if the passion players have for the game becomes entangled with a nostalgic connection to place, via memories of game conquests or encounters sparked by the game. This finding also indicates the value of collaboration with brands associated with users' childhoods in order to create a sense of connection with the product – a fact long accepted in the

33

field of marketing, and applied in recreational games, yet under-utilised by serious games and gamification. Broadly, this study suggests the importance of considering how an emotional connection to content might encourage deep and mass engagement with other gameful technologies and spatial interventions.

CONCLUSION

Pokémon GO, as a successful AR game, provides indications of how to motivate social connectedness through play in the real world and what form it might take. Specifically, players experienced a sense of belonging, the novelty of commencing conversations with strangers, and strengthened ties with family and friends. This was due to the use of readily accessible technology, enabling players to easily integrate PGO into their everyday lives, as well as their shared passion for the game, and game mechanics that required players to play outside. Finding that shared passion was at times due to a nostalgic connection to the franchise suggests the value of other fields' collaboration with the games industry, as associations with established game franchises and narratives could be used to motivate the mass adoption of other information or behaviours, such as in a public health intervention. This research also establishes the potential for geo-mapped technologies to directly improve users' social connectedness through the fostering of a sense of belonging, and underlines the importance of physical public spaces – not just online ones – in facilitating positive social outcomes.

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