Building Positively Affective Location-Based Advertising: A Study of *Pokémon GO* Players

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ABSTRACT

With the expanding popularity of Location-Based Games and the rise of advertising therein, there exists a need to comprehend the impact of Location-Based Game Advertising (LGA). This paper seeks to identify what makes positively affective LGA, leveraging *Pokémon GO* as a probe. Researchers conducted twenty-seven (n=27) semi-structured interviews with *Pokémon GO* players to reveal lived experiences regarding LGA. Our findings highlight the following direct implications for LGA: (1) LGA act as a digital billboard, conveying qualitative alongside locative information, and (2) well-received LGA enhances the player's agency. We additionally identify findings that have auxiliary implications to LGA: (3) positive memorability occurs when points of interest match physical reality, and (4) ludic engagement is a mediating factor in the memorability of locations. This research demonstrates that LGA in Location-Based Games is surprisingly well-received. However, developers must provide extra consideration to the player's agency for such techniques to be effective.

CCS CONCEPTS

• **Human-centered computing** → **Human computer interaction (HCI)**; **Collaborative and social computing**.

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KEYWORDS

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1 INTRODUCTION

Modern locative media represent the introduction of digital contexts to physical spaces. Leveraging mobile applications and locative data [2006, 2014, 2015] locative media can present users with information predicated on their physical location. Therefore, the introduction of locative media can recontextualize a user's perception and memory [1960] of physical space. Researchers have explored recontextualizations of space and its impact on users through locative media at length [37, 55, 58, 62]. Advertisers have recognized the impact of locative media, using them consistently in Location-Based Advertising [3]. Through geospatial data, an advertiser may easily present a user with a litany of ads customized to their region with great success [76, 81].

Location-Based Games, a form of locative media, extend the imposition of digital space upon physical reality by overlaying it with digital information that can be used in conjunction with mobile technology to produce new forms of play. The technology employed by such games varies, with some requiring only a means of geospatial reckoning (e.g., a GPS) (Geocaching [2000]) and others pushing the boundaries of available technologies (Uncle Roy All Around You [2004]). With the rise of geospatial computing in mobile devices [2014], Location-Based Games have become increasingly

accessible and popular, as typified by *Pokémon GO* [47]. As part of the global franchise, *Pokémon GO* allows players to recontextualize their world and take on the role of an adventuring trainer.

After its explosive release in 2016, *Pokémon GO* has been researched academically at length for its qualities regarding well-being [18, 36, 78], territoriality [33], socialization [18, 43], and a litany of other attributes. Interestingly, despite the long tenure of advertising in *Pokémon GO* [2016, 2016], the literature surrounding the impact of in-game advertising on its players is practically nonexistent. Advertisements in Location-Based Games contexts—referred to as Location-Based Game Advertising (LGA) — effectively insert advertising campaigns into the games, utilising the hybrid properties of Location-Based Games and enhances physical locations (geofenced or points of interest) with gameplay elements of mechanical significance.

Recently, Niantic has extended the scope of advertising in *Pokémon GO*, introducing sponsored game resources (known as supply balloons [2022]). Likewise, it has increased the number of businesses that can sponsor in-game Points of Interest (PoI) [2021c]. As *Pokémon GO* is still the largest Location-Based Game [2020, 2020] it is vital for researchers to explore how advertising in this context impacts the players of the game.

Initial forays into LGA indicate that Location-Based Games' advertisements impact the players of those games. In multiple studies [2022b, 2019, 2017] signs point to LGA in *Pokémon GO* being a viable tool to drive players to engage with physical businesses. Yet, the player's dedication to the Location-Based Game appears to have minimal impact on the efficacy of such advertisements [32]. The current literature, however, has yet to elicit the lived experiences of Location-Based Games players and their response to specific design affordances in *Pokémon GO*.

This research seeks to fill this gap through a collection of interviews designed to reveal the lived experiences of *Pokémon GO* players as they pertain to LGA. To this end, we gathered twenty-seven participants from the *Pokémon GO* community to participate in one-on-one, semi-structured interviews. We leveraged a semi-structured instrument (Appendix D) to conduct these interviews. The instrument explores three questions generated from the literature and the gap therein:

(1) Does player interaction with a sponsored location result in recognition of the location's brand?
(2) What models of presentation for Location-Based Game Advertising are acceptable to players?
(3) Does player dedication to the Location-Based Game impact the value of Location-Based Game Advertising?

In total, twenty-seven interviews were completed during May 2022 using the Zoom [2022] platform, painting a hitherto unseen image of the state of LGA and player relations. Our research outlines several key findings directly related to the construction of LGA:

(1) LGA acts as a digital billboard, conveying qualitative information alongside locative information.
(2) Well-received LGA enhances the player's agency by providing more choices.

We also identify factors that improve player memorability of locations, a factor that contributes to successful advertising campaigns:

(3) Positive memorability occurs when points of interest match physical reality
(4) Ludic engagement is a mediating factor in the memorability of locations.

Our paper begins with a review of the literature surrounding game advertising, Location-Based Advertising, and player agency. We then describe our methodology, detailing how the interviews were conducted, gathered, and analyzed. After, we present the findings of these interviews and discuss the implications. We conclude the paper by outlining the future of LGA research and the limitations of the present research.

2 BACKGROUND

2.1 Game Advertising

Before exploring how *Pokémon GO* leverages in-game elements to construct LGA, it is essential first to comprehend extant work regarding game advertising. The history of advertising in video games is practically the history of the medium, with samples such as Tapper [1983] (Budweiser) and Kool-Aid Man [1983] (Kool-Aid) existing since 1983. In its 2014 report, the Interactive Advertising Bureau (IAB) [2014] outlined three categories of advertisements involving games: custom-branded games, in-game ads, and around-game ads. Around-game ads typically refer to advertisements beyond the bounds of the game, such as banner ads or pop-up ads on the website hosting the game [28].

Custom branded games, also known as advergames, are long-term ludic engagements integrating a business's branding to the game's design [7]. Branded games include free promotional games (Chex Quest [1996]) as well as paid games (Pepsiman [1999]). Advergames represent a potentially powerful tool for engaging consumers, which, when deployed adequately, can improve brand associations [67, 73]. In a study of advergames, Lee et al. [2014] indicate that advergames increase purchase intention and improve attitudes towards brands. Similarly, Zhao and Renard [2018] found playful behavior in advergames encourages players to spread the games with their peers, opening the brand up to further incidental discovery.

In-game advertisements act as a middle ground between advergames and around-game ads. While not necessarily linked to the ludic experience, in-game advertisements are diegetically embodied in the game. Static in-game billboards represent a classical implementation of such advertisements [28]. Martí-Parreño et al. [40] studied the effects of in-game advertising using diegetic in-game billboards. The researchers determined that brand recall and recognition are impacted positively by in-game advertising; however, pre-existing familiarity with the brand required less repetition of in-game ads to manifest this trait.

Ghosh et al. [2022], however, note that when compared to traditional television, in-game advertising featuring a brand logo and name is significantly less effective. Interestingly, the researchers additionally note that exclusively using either a visually distinctive brand logo or brand name yielded better results in recall in participants. Palmas et al. [2021] similarly found that observers of in-game advertisements, in the form of static billboards, had better brand recall than their game-playing peers. The researchers posit that game skill and cognitive loading may be the source of lowered recall, a conclusion supported by Ghosh et al.'s [2022] reasoning.

Further, Lee et al.'s [2014] findings align with Palmas et al.'s [2021], as both found interactive contact with the advertisement fosters better brand recall.

Building upon in-game advertising, the value- xchange model offers in-game rewards to encourage player interaction with advertising [28]. Implementations of value exchange advertising leverage the improved brand recall afforded by interaction with advertising elements, as highlighted by Lee et al. [2014] and Palmas et al. [2021], while simultaneously rewarding players in-game to offset potential frustration. Guo et al. [2019] note that this advertising model can be particularly lucrative, assuming the reward value supplied by ad interaction exceed the consumer's nuisance cost. This model is increasingly popular in mobile gaming; moreover, Google best practices note that 50 percent of users would be disappointed were value exchange ads removed entirely [25].

2.2 Player Agency

Frustration with advertising in ludic contexts is directly related to violations of player agency. Murray [1997] succinctly defines game agency as "the satisfying power to take meaningful action and see the results of our decisions and choices" (p. 126). This definition implies that agency is directly related to the ability of the player to affect change in the game world consistently to express intent. For example, a platformer game has a specific input to trigger the player's avatar to jump in-game. If the jump action always occurs upon input, the player can express their intent appropriately, conveying a sense of agency. In contrast, if the input only occasionally works, the game would violate agency.

Such a violation of player agency represents an improper translation of player intention. Johnson [2015] considers a poor translation of intent into action as an ambivalence of interaction between the player and game machine. They further assert that this ambivalence results in frustration in players of the game, which may lead to negative consequences for the player's perceptions of the game. *Steel Battalion: Heavy Armor* [2012] is one game that poorly embodies player intent through motion controls emulating mech suit piloting. Contemporary reviewers [2012] note that player intent doesn't translate well to their representation in the game world, through the control mechanics negatively impacting the game's immersive qualities. What results is a negative sense of frustration that reduces the positive ludic experience for the player. Johnson [2015] further explores conceptions of agency through *Papers, Please* [2013], which harnessed frustration beneficially in its realization of its narrative. Playing a customs agent for the fictional nation of Arstotzka, the game's designed affordances are overly complex and lengthy for simple tasks, immersing the player in the game.

In a meta-synthesis of agency, Jennings [2019] asserts that agency is a negotiated construct. Each game has a different conception of agency; action games, for example, have different requirements for unambivalent control than strategy games. Regardless of the game's conception of agency, some designed affordances impact player agency negatively. In a study of the impacts of in-game advertising on children, Martinez [2019] identifies in-game advertising (e.g., pop-ups, streaming video clips, banner ads) as negatively impacting player agency. Martinez notes that this lack of agency harms immersion, enjoyment, and achievement in gameplay. The result is a negative perception of the game. Consequently, some players may even delete the game's application. When considered in the framework of the value exchange advertisement model, such advertisement would contribute disproportionately more nuisance relative to the positive experience offered by the game. As a corollary to this, the impact of the advertisement on the player's agency is central to calculating the nuisance cost of a value exchange.

2.3 Locative Media Advertising

Location-Based Advertising traditionally manifests as static signage and billboards, using low-technology solutions to engage local consumers in direct marketing [3]; traditional Location-Based Advertising is by its nature limited in outreach and expensive when compared to digital advertising. Modern locative media advertising, typically implemented on mobile devices, seeks to enhance direct marketing strategies by addressing consumers in a more expansive (than signage), yet still localized, region in real-time for lower costs [3].

This advertising modality appears to serve more relevant information to potential customers than traditional means, enhancing a campaign's efficacy [76, 81].

Mechanistically mobile Location-Based Advertising leverages either a push or pull to deliver the advertising content [44]. Push-based advertising is performed automatically by the advertiser sending users mobile messages [14] or app-based notifications [22]. Pull-based advertising occurs at the user's behest, placing control of the interaction in the hands of the user (e.g., opting to watch an ad for a reward) [82]. In giving control of the interaction to the user, pull-based advertising tends to be more well-regarded by consumers [70].

While primarily locatively driven, Location-Based Advertising also appears to be affected by the temporal context in which users find themselves. Receiving Location-Based Advertising during leisure time is more positively received than Location-Based Advertising consumed during working hours [13]. Further, Location-Based Advertising is more effective when consumers are already open to consumption: during commutes, shopping, or lunch breaks [13, 22]. The locality of the advertisement also matters in Location-Based Advertising, as Molitor et al. [2020] note; click-through rates on pull-based advertisements are higher when consumers receive advertisements sorted by the distance to the advertised business. Location-Based Advertising, therefore, sits at the intersection of locality, temporality, and mobile technology. Location-Based Games similarly occupy this intersection, albeit with a ludic contextualization.

2.4 Location-Based Game Advertising in *Pokémon GO*

Given the contextual similarity between Location Based Games and Location Based Advertising, it is no surprise that some Location-Based Games have had advertising enmeshed in their designed affordances since their inception. The enmeshment of advertising in Location-Based Games is particularly apparent in *Pokémon GO*, where a value exchange advertising model has been present since its launch in 2016. Starbucks and McDonald's negotiated deals wherein franchise locations would become PoI in-game (sponsored

locations) that would serve branded images, as well as sponsored messaging to players of the game [69, 72].

Mechanistically, in *Pokémon GO* there are two significant classifications of PoI: pokéstop and gyms. Both pokéstop and gyms are centers of play in the game [2022a], offering players resources in exchange for interacting with the location in-game. Typically, players will tap on the PoI on the world map and have the option of spinning a "photo disk" for ludic rewards. The photo disk shows the player an image related to the real-world location of the PoI and, if tapped, will give the player contextual information about the site. Players are sometimes also rewarded with gifts to send to other players that act as a postcard from the PoI with some ludic rewards.

Gyms additionally act as loci for competitive and cooperative play. Players may place their Pokémon, game pieces used to conduct battles, inside unclaimed or ally-controlled gyms to make an ownership claim. If a non-allied team controls the gym, the player must "challenge" and defeat the incumbent Pokémon before staking a territorial claim. Ownership confers ludic rewards to the player: more rewards from spinning the photo disk, additional attempts to capture raid Pokémon, and, most importantly, Pokécoins for extended stays in the gym. Beyond ludic rewards, however, ownership claims allow users to engage in playful antagonism that improves engagement with the game [34, 56, 57, 64, 79]. Cooperatively, players come together to engage in "raids," large-scale battles where players of any team must co-operate to defeat a powerful Pokémon in battle [6, 68]. Completion of the raid offers the participants a chance to capture the boss Pokémon, adding it to their collection of game pieces, and receive resources unavailable from other sources.

While pokéstops don't have raiding or gym ownership, they have advantages over their gym counterparts. Players may also receive in-game quests known as "research" that reward the players with resources for completion. Players may stake ownership claims of pokéstops through lures, in-game items that summon showers of flower petals centered upon pokéstops [68]. Beyond this visual enhancement, players within range of the stop have an increased chance of encountering rare Pokémon. The pokss display the player who placed the lure, once again conferring a sense of territorial ownership over the PoI.

Visually sponsored locations are incredibly similar to their non-advertising counterparts, with the key distinctions being a purple shape below the disk element of the PoI, *sponsored* text on the photo disk view, and branded images (See figure 1). Regardless of PoI type, the indicators of a sponsored location will remain the same; however, gyms additionally can be "ex raid gyms," which provides players with an opportunity to take place in a premium raid event [68]. Recently, Niantic expanded its sponsored locations program to include small and medium businesses in the "Local Business Recovery Initiative" [2020]. The program encouraged communities to vote for local businesses to receive a free year of their location becoming a sponsored location.

The other extant LGA modality embedded in *Pokémon GO* uses in-game balloons to deliver campaigns directly to the players. These "supply balloons" are geofenced gifts delivered automatically to players in the advertised region [50, 52]. Supply balloons appear as a diegetic element of the game and allow players to choose to interact with them. If the player interacts with the balloon, it will

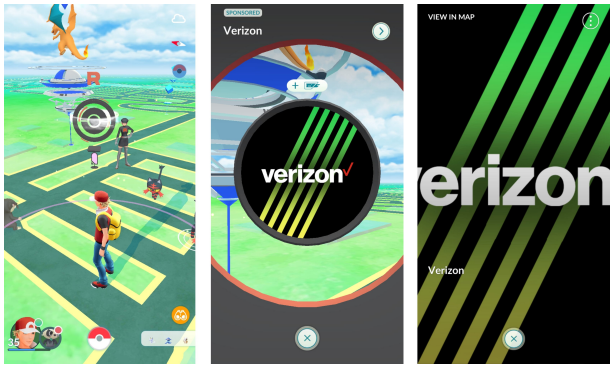

Figure 1: Interaction flow for a sponsored location pokéstop, note the purple shape under the stop highlighting a sponsored location.

show them a timed advertisement requiring the player to engage with the messaging for a minimum amount of time. During this time, the player is additionally rewarded with in-game resources and given links to learn more about the advertiser or save any offers in the advertisement. We provide a sample interaction with this form of LGA in figure 2.

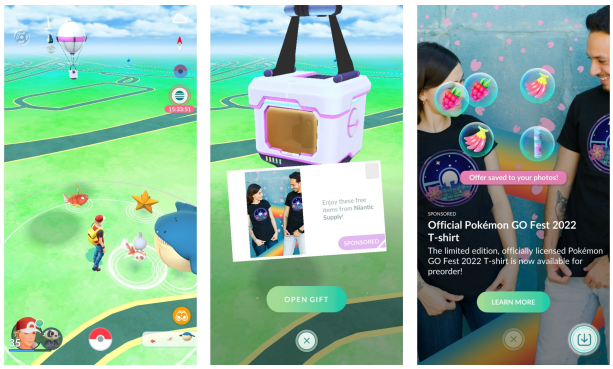

Figure 2: Interaction flow for sponsored supply balloon.

Niantic integrated these LGA elements into *Pokémon GO* some time ago. However, there is a considerable gap in the literature on LGA's impacts on players. This paper seeks to address this lacuna through a collection of semi-structured interviews of players of *Pokémon GO*. Following this is an in-depth review of our methods to explore this space.

3 METHODOLOGY

For the present research, we elected to leverage a qualitative approach to gather lived experiences of *Pokémon GO* players relating to LGA. Qualitative methods allow for nuanced takes on human experience that elevate the voices of the researched [2]. We used semi-structured interviews, as the technique is employed frequently in similar work [6, 15, 41, 71, 75].

To conduct these interviews, e recruited participants from the *Pokémon GO* population with the assistance of Niantic's operations

team. During May 2022, Niantic sent emails directly to players of the game, inviting them to complete a questionnaire hosted on Qualtrics [60]. Participants then completed the survey, gathering demographic information and experiences with *Pokémon GO* and in-game advertisements. The survey's final question encouraged participants to register for a round of semi-structured interviews by supplying an email address. We advertised an approximately 25 USD in-game reward for participants who completed these interviews.

The survey's final question was the only question of consequence to the present work. We used answers to the final question to create a list of possible interview participants rather than inviting them to register outright. Given the size of the player base [2020], we expected to be inundated with interview applications to generate a pool of users; the survey allowed us to control the rate of recruitment if necessary. We additionally wished to perform basic quality filtering on the survey to ensure we only invited players we expected to participate in good faith. As our Institutional Review Board (IRB) certification only allowed for eighteen and older participants, we first omitted all candidates who violated this restriction or did not consent to study participation. Following our initial filtering, we dropped participants who provided low-quality survey responses (e.g., missing answers). As the objective of the present research is to gather lived experiences, and the survey was used only for recruitment, this work does not report on this survey further. For completeness, the recruitment email and survey questions are reproduced in appendices A and E, respectively.

Interview recruitment began on the second day of the study, drawing from a pool of 5,000 email addresses that met filtering requirements. In the hope of acquiring interviews with more than just the fastest respondents, we employed randomization, leveraging the pandas sample function [2022] (appendix C.1), selecting four-hundred participants. We did not use participant responses (e.g., location, dedication, advertising visibility) to restrict recruitment.

Selected participants were invited with an additional email, reproduced in appendix B, to schedule an interview using the online calendar tool Calendly [10]. The registration provided participants with an informed consent document, advising them of their rights and highlighting that the interview would be about forty-five minutes long and conducted on Zoom [84]. These interviews were recorded and transcribed by Zoom's transcription feature for use in coding and analysis. One hundred participants then scheduled the date and time of their interviews, with twenty-seven attending and completing them. Two participants attended their interview but were unable to complete it. One participant needed to drop off early, and another could not complete the interview due to language barrier issues. The remaining seventy-one participants did not attend their scheduled interview time.

Demographically our participants (27/27) exclusively come from the continental United States (section 6.1). Regarding gender, thirteen participants identified as male, thirteen as female, and one identified as neither. Interviewees were mainly in the 25-34 (9/27) and 35-44 (7/27) age ranges. Furthermore, most of these participants have been playing the game since its launch (23/27) and consider themselves very dedicated, with most playing seven days a week (18/27).

We conducted the interviews over May 2022, each for approximately forty-five minutes. Before starting the interview, all participants were reminded of their rights outlined in the informed consent document and asked if they were comfortable being recorded for transcription and data analysis. All participants consented to be interviewed and recorded for this study. /revisionBegin The remainder of this work will anonymize participants with monikers and a unique alphanumeric identifier. The identification consists of the character P, representing the participant, and a 3-digit number randomly assigned to the participant. Table 1 presents each assigned moniker and some basic demographic details to better frame the remainder of this work.

Structurally, the interviews were centered on three classifications of questions: (1) demographics, (2) in-game locations, and (3) in-game advertising (see Appendix D for a listing of top-level questions). The demographics section elicits the experience the participants have with *Pokémon GO*. We gathered the age, gender, and location of participants at the time of recruitment. The in-game location section focuses on participants' relationship with place and space in the confines of *Pokémon GO* to establish a baseline relationship with Location-Based Games before exploring LGA. The final section explored participant relationships with extant LGA design elements: sponsored locations, supply balloons, and in-game clothing. Additionally, we presented participants with hypothetical LGA modalities, including multimedia advertisements and banner ads.

In conjunction with Niantic's operations team, we constructed a structured interview tool consisting of thirty-seven core questions with follow-up and clarification questions specified. In practice, questions would follow a pattern of asking broad questions to avoid leading the participant toward one possible design element. We followed these broad questions with clarification questions to target specific design elements: extant or hypothetical. For example, a broad question such as "What kind of advertisement in Pokémon GO is too far?" would be followed with prompts asking about hypothetical banner ads and existing sponsored clothing. We leveraged open wording to allow the interviewer to tailor each interview to that participant's lived experience, gathering richer data.

Following the completion of the interviews, two authors participated in an independent inductive thematic analysis [2, 8] of the interviews. This analysis was then iteratively conducted to determine common sentiments regarding the investigated design elements. Using tools for qualitative analysis (Nvivo [59]) authors coded actual participant quotes using direct quotations for code names. The authors iterated upon these initial codes, renaming them into more general themes. Finally, authors grouped independently identified themes into thematic frameworks for collaborative evaluation and alteration.

The fruits of this thematic analysis were then analyzed collectively by the same two authors of this work, generating a thematic framework to interpret the interviews. To synthesize the distinct analyses conducted by the authors of this work, each presented their coding and suggested thematic frameworks. The authors discussed these differences in the analysis to resolve conflicts and achieve interpretations of the data that satisfied both coders. Collectively, the authors identified five key themes using the data: (1) the impact of player agency, (2) how rarity frames LGA, (3) the memorability

of PoIs, (4) how to emphasize LGA through hybrid interaction, and (5) indicators for LGA consumption.

4 FINDINGS

4.1 The Memorability of a Pokéstop

Before understanding how our participants interact with LGA, we must first identify how they interact with our targeted Location-Based Games. Most of our participants were habitual players of *Pokémon GO*, and many (20/27) reported playing every day of the week, with the mean playtime being one to two hours a day. For such participants, the game has become entangled in their daily routines occupying the idle moments of their lives, as is the case for Will (P11), who described *Pokémon GO* as "something to do on the way to work and when I'm riding the bus. It's a daily form of entertainment." Moreover, it takes the form of a ritual with participants such as Dot (P18) and Linda (P23), who check their phones every morning to maintain in-game streaks. Arlene (P16) takes their play even further, deliberately organizing portions of their life around events in the game.

> *It's bad to say [because] I'm at work [in the] afternoon, and no matter what, I need to get my stuff done by seven o'clock on Tuesdays for spotlight hour, and Wednesdays, I gotta make sure I have my hour open for raid hour.*

Our participants characterize their interaction with the Location-Based Games as an ebb and flow between incidental and intentional play states. Participants built mental maps concerning specific physical spaces from repetition and repeated exposure through incidental play. Tona (P03), for example, explicitly described having a "mental map," which incorporated in-game points of interest (PoI) along routes they would take. More importantly, the participant made "mental notes" of pokéstops and gyms in places that "[they] normally go or that is a frequent stop for [them] along [their] route." For stops that participants, such as Tona (P03), visited for the first time, they would not necessarily add it to their mental map:

> *If I'm going somewhere for the first time, I'm probably not going to notice [the PoI] or make a mental note because the chances of ever going by there again will be slim to none.*

Repeat visitation of PoIs were what made them memorable in this case. Most of our participants (17/27) supported this sentiment, with seventeen others sharing similar stories highlighting repetition as a key factor in their recollection of PoI. Unsurprisingly, these pokéstops and gyms would also be easily accessible from common commuter routes or nearby vital resources such as grocery stores.

Ease of access would also result in participants selecting locations to visit. Kimmy (P04) self-identified as living in a non-city location where travel by car was the transportation norm. In this circumstance, ease of access, particularly the ability to park one's car in the range of a PoI, was vitally crucial to selecting a location to visit. Yet this desire for ease of access was not necessarily for convenience, it was to ensure they were not intruding on the property hosting the PoI.

> *I don't want to go on people's property … so if there's a parking lot or something, then I'm good with it. I know where [public spaces] are around here that [are] not intruding on anyone's personal space. … [That's why] in the city it's great because you're on a corner and it's a gym. There are no issues, and you can stand there.*

Therefore, PoI with low ambiguity in public accessibility act as a sort of draw for participants to engage in play. Those participants who play the game in an intentional manner chose such locations with low ambiguity to public accessibility. Participants described selecting locations that were not only publicly accessible but densely populated with PoI when engaging in intentional play. Local parks or shopping centers were common locations for this more structured play. Link (P07), an extremely dedicated player, would spend weekends going to parks, noting that they "knew where to go" to "maximize … pokéstop spawns, gyms, or anything like raids." The ludic properties of densely populated PoI allowed participants to better recall locations (13/27), with some noting that the density more directly contributed to their memory of the locations than physical attributes, as noted by Joel (P08):

> *There's a good cluster of stops like this rock, this statue, and this bench are all stops. … so I'd say the density of stops is a big part.*

Several participants reinforced the shared importance of the physical representation of pokéstops and the density of other PoIs nearby. To Shayna (P26), the local park was a nexus of PoI in *Pokémon GO*, yet the physical presence of the PoI subject enhanced the memorability of the digital representation.

> *There's about eight [PoI] right now down there [at the park], so having the fun at the park and [playing] Pokémon GO. … There's a lion there, and the Pokémon stuff is the lion. … The kids are like, 'the lion is a part of the pokéstop where we can get new Pokémon and spin.'*

The perception of the location exists in the minds of the participant and their children, with both the game context and physical setting contributing to a hybrid reality. While either component could exist on its own, the coherence between the physical and the digital creates a new context wherein both encourage recollection of the other. In the case of Shayna (P26), this coherent hybrid reality was joyful, firmly establishing the locality as a place of play in the family's eyes.

Similarly, Dot (P18) played with their child in areas dense with clusters of PoI. The density of PoI acted as a pull, but memorable physical landmarks such as "beautiful" murals allowed Dot (P18) to remember where "even some of the more obscure [PoI] are."

4.1.1 Engaging PoI. Eleven participants (11/27) directly referenced "interesting" artwork or historical sites when recalling memorable PoI in our interviews. Significantly, historical landmarks were one of the most important reasons that participants (13/27) would engage with PoI so thoroughly that they would read the complete stop description. For these participants, a curiosity for their surroundings and a love of history spurred them to engage with PoI actively and not simply interact in the ludic context of *Pokémon GO*. Jenna (P06), a self-professed history lover, found themselves deeply engaged with PoI, frequently reading them to learn the history of

their community, "discovering so many things in [their] town." This interaction extends beyond simple consumption; Jenna (P06) would actively research local buildings and their community's history to enrich in-game PoI further through Niantic's wayfarer program. In short, the locative aspect of Location-Based Games was a driving force in Jenna's (P06) interaction with the game. Another who reads stops for history, Ronald (P22), "an amateur historian," noted that they would give PoI with historical significance "a general cursory glance [because] … you just don't know what you might miss otherwise." In these cases, participants were seeking to enhance their experiences in the spaces through the additional context of the PoI, reframing their understanding of locations that may be unknown to them.

In contrast, player familiarity with locales and locations appears to be a hurdle to engagement with PoI in Location-Based Games. For Jack (P14), PoIs are disinteresting in their hometown, rarely inspiring them to engage with the descriptions. To them, "a lot of it is stuff that [they've] grown up around, and it's just regurgitated material that [they] have seen for 30 years." Why bother reading a stop when you already know what it will say? Participants commonly extended this sentiment to local and chain businesses in the area. Both Becky (P09) and Millie (P17) expressed that they would not read about Starbucks locations because not only were the descriptions frequently unchanged but also apparent to an advertising-savvy consumer. A lack of a ludic reward would motivate some participants to refrain from engaging with PoI in-depth. Cindy (P13) would use PoI just to "collect [their] supplies" to play the game because they "were always on the go … [taking care of their] five kids." Time is a commodity to Cindy (P13), and the reward of engaging with the PoI in-depth did not outweigh the value of the time it consumed.

When asked for potential incentives to increase PoI engagement, our participants most frequently noted that PoIs need more "interesting" descriptions (9/27) to be worth engaging. Incentivization could manifest as "additional business information" (Adam), an "interesting tidbit" (Kimmy), or even "more eye-catching material" (Jack). Less commonly, participants suggested embedding metagames into PoI descriptions. Sue (P05) suggested a quiz that would reward players for correctly answering "little questions" about PoI, providing a ludic reward for directly engaging with the PoI. Similarly, Molly (P02) suggested the addition of description-embedded "puzzles" that "you have to read the description to solve the puzzle." Once again, expanding the act of reading about PoI to be included in the ludic context.

4.1.2 Hybrid Dissonance. Scenarios further complicate PoI engagement wherein the virtual world of the Location-Based Game does not match with the physical reality occupied by the players. Here, a missing statue or art piece, a destroyed building, an inaccurate location marker, or even a photo taken during a different season can create dissonance in the player's hybrid reality through engaging in the Location-Based Game. For some, this dissonance is enjoyable and engaging.

For example, Brad (P10) recalled experiencing outdated PoI as enjoyable because "[they] got to see what it was like before [something] got removed." An outdated PoI was similarly memorable to Adam (P01); the PoI featured a "statue that had been partially removed, [but] the picture in the game had the original statue." The existence of the statue PoI in the game acted as a window to the past, expanding the temporal context of the space to a time when the statue was still intact. Unfortunately, the statue had been "a colonizer," highlighting a potential flaw in Location-Based Games and hybrid spaces preserving improperly contextualized monuments that may inflict harm.

In contrast to Adam's (P01) and Brad's (P10) experience, Joel (P08) considered PoI mismatches,in their case a nonstandard/incorrect PoI name, to harm how they experienced the game.

> *In the town over from me, there's a pokéstop that is [literally] called "this is the [town name] train station." That bothers me a lot … I noticed my friend sent me gifts from it and I really want to find it and change it.*

While the dissonant name for the PoI has no ludic significance, it impacts Joel's (P08) immersion in the game and serves as a pain point they highlighted in their interview. While of low ludic significance to Joel (P08), others noted that mismatches between the PoI and reality impacted gameplay. Molly (P02) described an experience trying to find a "new [pokéstops] covered in snow" in the game. Unfortunately, when visiting the PoI, the weather conditions were different, making it difficult for the participant to find the PoI because they "[didn't] know what they were looking for." Similarly, Link (P07) and Joel (P08) recalled issues in which PoIs were not in the correct location, impeding play.

4.2 Recontexutalization of Space Through Sponsored Locations

While it is possible for "normal" PoI, typically submitted through a user recommender process called wayfarer, to feature a business logo or branding, it is infrequent. So infrequent that six participants (6/27) included a logo as an identifying factor for sponsored locations when asked to describe what sponsorship looks like in *Pokémon GO*. Typically participants reacted neutrally to branded photos on PoI. Brad (P10) notes that "there [is] a company brand logo … [at] Sprint or Starbucks locations, and none of them stand out as much as actual landmarks or monuments." While Brad (P10) incorporates the sponsored location into their mapping of their surroundings, they have less of a draw than the more organic stops added to the game through more traditional means.

Two participants (2/27) found the branded images distracting from their immersion in the game; however, their complaints were minimal. Joel (P08), a participant sensitive to mismatched digital and physical reality, registered that sponsored locations are "less immersive in general … sticking out like a sore thumb." However, they qualified their frustration, noting that it did not bother them, just that they "noticed it." Another participant, Jack (P14), appears to provide a possible explanation for this pain point minimization.

> *[I] recognize the [sponsored location] is absolutely 100 percent advertising, but at the same time, everywhere else that's around them that has a [PoI] is getting free advertising.*

Jack (P14) suggests that there is an understanding that PoIs in-game that represent real-world businesses are already a form of

advertising for the business itself, regardless of sponsorship status. Participants considered PoI at businesses as a digital billboard, with Link, Linda, and Aaron directly referring to business PoIs as such. Such PoIs encode both the purpose of such businesses (e.g., service type or products) and geospatial locative data, providing players of the Location-Based Game with immediate awareness of the location and an understanding of what and where it is. Demonstrating this benefit, Link (P07) used *Pokémon GO* to find their way to "[landmarks] in town that [they] did not know were there, because they were a stop or gym [in-game]."

While not universal, many participants (17/27) noted that PoI could act as an attractive force, particularly in commercial contexts. Some, such as Jack (P14), were drawn to pass by PoI to "get spins" and interact in purely ludic contexts. In these cases, the participant would not necessarily engage with the business, but they did have increased exposure. Jenna (P06) highlights this behavior, recounting her community's interaction with the Sprint promotion; "We would all congregate at the mall around the sprint kiosk, … there was always like twenty-something people that would congregate." While the participant made no purchases, a gym at the kiosk acted as a major attractive force for local players, encouraging foot traffic and awareness around the location. Moreover, there was an auxiliary effect: it encouraged "people that worked at the Sprint [store to start playing]." While the intent was to attract players to the location, the sponsored location inspired play in those who were not necessarily engaging in play at the time. However, in the case of telecommunication companies such as Sprint and Verizon, participants frequently did not engage with the business commercially due to a lack of overlap in commercial needs.

Other participants described a separate campaign, this time featuring a collaboration between *Pokémon GO* and the Circle K gas station chain. Joel (P08) noted that historically they "don't really make a conscious decision about which gas station [they] go to, [but] if [they] see [a Circle K], it's worth a stop to get that special research task." While their motivation is partially ludic, Joel (P08) still intentionally altered their behaviors. The product offered by Circle K, gas, was a necessity for the participant; as such, the presence of a PoI encouraged them to visit the sponsored locations over another similar gas station in the area. In the case of Amanda (P15) and Arlene (P16), the pair would actively seek out Circle Ks in their immediate and surrounding area. The pair availed themselves of a promotion embedded in the sponsored location while also actively gathering "postcards," a feature in *Pokémon GO*'s gift feature, of the different locations. Once again, the advertising aligned with the ludic needs of the participants while also providing them with products they were willing to purchase.

Interestingly Arlene (P16), when asked about the Starbucks campaign, did not engage with the brand with the same enthusiasm as they had with Circle K. However, they explained that they do not drink Starbucks; they would "rather [use their] eight-dollar coffee on [their] game." Participants appeared eclectic in selecting sponsored products and services based on pre-existing desires and needs. In short, the LGA led the participants to the business; however, the final purchasing decision was squarely in the hands of the consumer.

Moving forward, restaurants saw a great deal of intersection between Location-Based Game play and business interaction. Yet the restaurant was not necessarily the focus; instead, participants would intentionally select restaurants based on proximity to PoI. When Jenna (P06) travels, they "will pick [a restaurant] in that community based on [having] a gym." They would suggest the restaurant to their companions to engage in play using whatever PoI was nearby the location in range. Further, there was a distinct preference for gyms (23/27) in this play context. Link (P07) articulates the typical reasoning for this preference:

> *[The gym] gives you something else to do, while you're [at the restaurant] because it could pop up as a raid, [or it] could just be a gym you can put your Pokémon in … [it] gives you an activity to do while you're enjoying the restaurant. … People play the game together ... they can defend the gym together to keep their Pokémon there, or they can take down the gym together.*

Link's (P07) example highlights that in addition to drawing a player to a business, PoI can additionally augment the experience. In a similar experience, Shayna (P26), alongside her children, would wait "about 15-20 minutes to make sure [they were] still in the gym" before leaving. While this represents a more extreme interaction pattern, it highlights sustained engagement. For consumers, this represents a willingness to remain in a space, frequently commercial, for an extended period. As noted above, participants (23/27) consider this engagement style strongly supported by *Pokémon GO* gym PoI. In contrast, a transitory engagement is fleeting; a consumer expects to move quickly in and out of the space. While pokéstops were selected as better suited for this engagement model (7/27), participants did not feel as strongly. Interestingly, while participants did indicate a preference for different PoI in the two engagement models, higher concentrations of PoI tended to have the greatest value for the participants.

Regardless of PoI type, however, participants generally viewed businesses that had their own PoI in a more positive light. Jack (P02) felt that the business with the sponsored location was "saying that, yes, we support your community." Similarly, Dot (P19) perceived the businesses as recognizing " something that [they are] interested in and the [business] is showing an interest in it, then it [makes] a connection." These sentiments were mirrored by those who perceived participating businesses positively (15/27), as they felt acknowledged by the business and more receptive to what they were selling. Participants commonly felt neutral to sponsored locations, with its existence not strongly impacting how they viewed the business.

4.3 Player Values and the Advertising Machine

Interestingly, sentiment towards LGA in the game was generally positive, particularly regarding sponsored locations. Non-LGA advertising modalities, in contrast, are less than cherished by our participants. Our participants (19/27) particularly disliked banner ads and pop-up video ads. Tom (P27) thought the addition of banner ads would be "horrible" because "it just eats up screen real estate and takes away from the game." For Tom (P27), an always-on banner ad would distract from the hitherto banner-ad-free gameplay experience and interface. In short, adding the banner ad would violate the design language employed by *Pokémon GO*, drawing

attention to the ad and away from the design elements that enable play. Another participant, Sue (P05), mirrors this sentiment, highlighting a preference for "[ads] that are more integrated with the actual gameplay."

Mechanistically, this aligns with frustrations about sponsored locations not having more traditional in-game photographs; however, as no mechanism for banner ads exists today, the disconnect is more severe. The ubiquity of banner ads in other games also harms participant perceptions of them as a design element in general. Brad (P10) and Marcus (P18) both saw banner advertising as "cheap." When asked to elaborate, Brad (P10) offered the following.

> *In the app store [there are] games that just look cheap. People would argue they're not "games" because it's just a bunch of advertising every time. To me, if you have a small little rectangle at the bottom of the screen, it's too much.*

The key offense of banner advertisements may not be that it reminds the players of "cheap" games but that the advertisement strips participants of their agency. A banner forces players to consume the advertisement without their consent or agency. Participants "don't feel like [they're] in control of [their] environment," as noted by Dot (P19), when forced to consume advertisements in the game.

Naturally, the negative impact of degraded agency does not just apply to banner advertisements. Eighteen participants (18/27) particularly disliked the possibility of pop-up multimedia advertising, having a notably adverse reaction to them as a possibility in *Pokémon GO*. Once again, participants, such as Adam (P01) and Kimmy (P04), compared the addition of a pop-up advertisement to other mobile games. Participants described their experience with similar descriptive words: intrusive, obnoxious, annoying, immersion-breaking, and "cheap." While rarely recognized in the context of a popup by our participants, Millie (P17) notes that they have an existing pain point with uncontrollable "pop-ups" in-game.

> *I'm glad they're working on the egg mechanic. When you've just reached a Pokémon you walked ten minutes to get to, and suddenly, you have two eggs [hatch], and the Pokémon [you were trailing] runs away.*

For Millie (P17), the intrusion of the egg pop-up extends past just the time it takes for the hatching animations to play. The loss of a chance to catch a Pokémon must also consider the time wasted to find it, in this case, 10 minutes. In this regard, flow-breaking design elements can consume more playing time than initially expected. There is an opportunity loss for the player, which can negatively affect their experience and perception of the gameplay elements. When considered through the lens of advertising-value exchange, this wasted time and opportunity contributes to the overall cost of the advertisement. If this cost exceeds the intrinsic value offered by the game, players may walk away from it, as Tona (P03) elaborates.

> *Any [advertising] that interferes with your ability to play the game in a reasonable amount of time is [too much]. I mean, it's one thing to have an advertisement pop up when you spin a pokéstop, that's fine. [If the advertisement] is adding significant time to my interface, I'm going to stop playing. ... [I play] to have a break from my day, not to read advertisements.*

Pop-ups and unsolicited advertisements detract from the time that players like Tona (P03) have to play the game.

4.3.1 Supply Balloons. After examining participant reactions to new possible advertisement modalities, a rationale for a generally positive perception of sponsored locations emerges. As noted above, sponsored locations are not very different from their non-sponsored counterparts: a purple mark is present on the in-game overworld PoI, the photo is frequently the brand logo, and the PoI description directly references the sponsored status of the location. Moreover, businesses that are not sponsors are present in the game, so the presence of other businesses does not violate any of the pre-established rules of PoI. The existence of the sponsored location does not interrupt the gameplay, but instead enhances it by giving richer rewards to the player and more PoIs for interaction. If anything, the value offered by sponsored locations exceeds the costs perceived by the players.

Pokémon GO has an additional LGA design element in supply balloons. Uncharitably, some participants, such as Brad (P10), described supply balloons as "a pop-up. [You] can't exit out immediately and have to wait one or two seconds to get the [rewards] then exit the screen." As a result, in the eyes of some participants (3/27), supply balloons are something to be avoided in the game due to their proximal relation to the dreaded pop-up advertisement of old. Moreover, the wait time in the design element was frustrating to participants who felt it infringed on their player agency and interrupted the gameplay. Wendy (P12) even found the interface of the balloon to be frustrating, noting that they "couldn't click out of [the advertisement]." Pain points in supply balloons give it a cost assigned by the player. When these costs exceed the value, they will choose not to interact with the balloon or outright dislike them.

In contrast, several participants (10/27) found the supply balloon experience delightful. Sue (P05) went as far as to describe the balloons as a "serotonin button." For these participants, the value does outweigh the perceived cost of the balloons; however, this may be for a practical reason, as Jack (P14) notes.

> *Where I live we don't have a pokéstop, I have to drive to get to anything [in-game]. So seeing [supply balloons] every now and again is kind of a blessing.*

Participant perceptions of value for supply balloons seem to increase with less access to PoI near their home. The LGA, in this case, enables the player to engage with the game more, offering supplies required to play. In the calculus of players such as Jack (P14), this benefit outweighs the frustration of waiting a few seconds because it is still less time than getting the supplies more "organically."

Yet, there was still a sense of excitement amongst our participants over supply balloons beyond being given additional chances to play the game. This excitement may be a function of the scarcity of the experience of encountering supply balloons for our participants (13/27). For many participants, supply balloons were so uncommon that they could not even remember the last time they had encountered one and who it was that had sponsored the LGA. In

being scarce, supply balloons function more as a novelty than an annoyance. As a result, they do not clutter the interface or game world excessively, and participants can ignore them easily.

Naturally, the opposite appears to be true as well. If supply balloons were more common, Linda (P23) notes, "every day and multiple times a day … they would probably be annoying." In maintaining scarcity, experiencing the supply balloon advertisement is spread further out and the time spent in the advertisement is less apparent. Interestingly, supply balloons were perceived (14/27) as being better suited to generate awareness of businesses or events. Brad's (P10) thoughts capture the participant's reasoning well.

> *I think supply balloons would be better [to generate awareness]. It comes directly to the location you're at. [If] you're at home and there's a couple of stops for a particular company or business … you're probably never going to know where that location is. If there was a [supply balloon] description [it could say], we're located here.*

While pokéstops and gyms function as digital billboards, they are ineffective if the target audience never visits the business' area.

4.3.2 The Value of Rarity. An alternative approach to improving the acceptability of advertisements that monopolize player time may be through employing rarity. We asked participants what it would take for them to interact with design elements that they had already expressed a distaste for (e.g., multimedia advertisements) Twenty participants (20/27) said they would engage with extended advertisements for items of perceived rarity. In *Pokémon GO*, this manifests as premium currency (coins), raid passes, rare candies, and other items that enable late-game content. These items are now difficult to acquire, requiring time, real-world money, or special events, and not normally accessible from typical PoI. However, this engagement does come with a notable caveat: the player must be able to choose when and if they experience the advertisement. Participants indicated a need to feel they could negotiate the terms of the value exchange. Aaron (P24) outlines how this negotiation might occur if they knew interaction with an advertising element would have a considerable time cost.

> *If I had the option, whether to click on that balloon and I knew there's going to be a chance of watching a 15 and 30-second ad, then you know, am I hard up for loot? Then I guess I'll click on it. If not, then I think we can let them float on by.*

For Aaron (P24), loot represents premium, rare items in *Pokémon GO*. Our participants considered engaging with an advertisement to be work, expecting appropriate compensation. The compensation also requires a degree of relevance to the participant's in-game needs. If the participant were at level 50, the current level cap in *Pokémon GO*, items that boost level-up speed would be irrelevant and valueless. To Joel (P08), lucky eggs (leveling tools) would be irrelevant; however, "if it were incubators, raid passes, or star pieces, then I would be more inclined to deal with it."

While rarity appears to drive our participants to interact with the in-game advertisement, it did not necessarily equate to an interaction with the business. Indeed, LGA increased foot traffic and business exposure for our participants; however, an interaction was generally dependent on participant needs, as noted above. A popular suggestion for a tangible draw to businesses was to use a "QR code [that is received when] making a purchase [that has] a redemption code to get something in the game," Molly (P02) notes. Participants suggesting this possible integration with the game generally sought exclusive loot, such as special avatar clothing or in-game currency, to be used at their discretion. With a purchase reward system, interacting with the business would carry a possible value for the player. Similarly, our participants regarded promotional deals and coupons well to encourage location interaction. While motivated by additional in-game rewards, Amanda (P15) and Arlene (P16) demonstrated the efficacy of promotional offers when combined with LGA, being drawn to Circle K's for free "gummy bears and quite a few [soft] drinks." When faced with the hypothetical draw of a coupon or discount, ten participants (10/27) considered it a sufficient draw, particularly for restaurants.

4.4 Anyone Can Advertise

For our participants, LGA appears to have a place in *Pokémon GO*. The near-seamless integration and agency-offering design patterns allow for an experience that feels unhindered by ads. Nevertheless, we must ask what kinds of businesses are appropriate candidates for employing LGA. Participants noted the benefits of LGA at cell phone carriers such as Verizon and Sprint; however, few engaged with the businesses directly. As Becky (P09) puts it, "[their] phone is working, so [they] don't need to go" to the carriers to get a new one. While participants need phones, particularly to play *Pokémon GO*, they did not necessarily need a new one.

In contrast, promotions involving brands such as Circle K (a gas station) and Starbucks (coffee) were more effective in drawing our participants to engage with the business. These businesses offer daily commodities such as coffee and gas, meaning there are more chances for a participant to encounter the business while in need of a resource it provides. Similarly, participants (10/27) identify restaurants and locations that typically have customers linger as promising targets for LGA. In those cases, additional PoI near the business is a draw in providing ludic benefits to a Location-Based Game playing consumer. Furthermore, family-friendliness was critical to some participants because, as Arlene (P16) puts it, "[there are] families with players as young as six years old." To that end, adult-themed LGA is not as well received by participants with children and runs the risk of associating the larger Location-Based Games with those themes

5 DISCUSSION

5.1 Location, Location, Location

Location-Based Games provide a framework for the player to negotiate the rules of their play [65]. More precisely, the game specifies the digital rules, while the player sets the conditions of their movement through space to engage in the play [74]. Within these digital rules, one of the most vital is the designation of PoI. When players engage with the PoI, they know what will happen precisely. In *Pokémon GO*, the display will shift to the perspective of a photo disk that the player can spin for rewards upon interacting with the PoI. Additionally, the player builds a vocabulary of design elements that establish legibility in their perception of the game map [45].

Players have expectations of how physical reality is represented and contextualized in Location-Based Games. For example, in *Pokémon GO*, players can expect to see an abstract map including roads and bodies of water. Pokéstops and gyms represent PoI with an accurate description with a photo representative of the physical location. A concrete, consistent design vocabulary allows players to more readily enter the hybrid reality created by a Location-Based Game. Because the player can make assumptions about physical reality from the virtual, they can integrate the wholly digital elements into their perception of the space with minimal affordances. Participants in our study sometimes note a sense of joy when the PoI meshed well with their perception of the physical world in a coherent manner. This joy manifests as a result of the player's ability to engage easily with the game at the location.

Coherent PoIs, in *Pokémon GO*, have proper names, up-to-date pictures, and exact locations, yet, there is no guarantee that a coherent PoI will be incorporated in their mental image of the space [39]. We can instead consider the coherency of hybrid realities as being a contract in good standing between the Location-Based Game and the player. Consistent representations afford more opportunities to recontextualize spaces as seen in prior work [34, 55, 79]. Spatial realism requires coherency in the hybrid representation of the world, a known factor in the memorability of locations in Location-Based Games [1].

In contrast, dissonant hybrid realities can be distracting to players. Dissonance in a hybrid reality can emerge from bad photos, inaccurate locations, and invalid names. Ironically dissonant PoIs were frequently memorable to our participants; however, this memorability is negative. Participants associated dissonant PoI with negative emotions and frustration as a cost to being memorable. Sufficiently dedicated players may even go out of their way to report dissonance in their hybrid reality, as observed in the present study. Hybrid dissonance becomes a source of frustration and undermines the previously observed benefits to Location-Based Games, causing mental distress rather than alleviating it [77].

5.1.1 I Remember Where That Was. As noted above, at least a basic coherency between the digital and physical is necessary to engender positive memorability. Alavesa et al. [1] even suggest that high-fidelity virtual environments are vital in establishing Location-Based Game players' memory of physical and digital locations. Yet our participants expressed a good recall of PoI that they had been to, despite the relatively low fidelity of *Pokémon GO*'s in-game map.

Participants also expressed the memorability of contextual landmarks: locations with ludic significance. While our participants demarcate the various Sprint stores as commerce locations, such physical elements are not inherently memorable landmarks. The introduction of PoI to these locations developed such spaces as points of engagement for the game and socialization with other players. The image of the storefront is transmuted from another point of commerce to one laden with meaning and significance [45]. Further, participants appeared to have a good awareness of the services offered by sponsored locations that carried ludic significance (RQ1); however, this did not necessarily translate into purchase intent. The individual needs of the participant determined the acceptability of commercial interaction.

Clusters of PoI similarly embody spaces with a contextual significance to players of Location-Based Games like *Pokémon GO*. A clustering offers increased opportunities for sustained ludic interaction and potential socialization. The Location-Based Game creates nodes through such clustering for players to leverage in their image of the place [39]. PoI spaced within walkable distances of one another can also have good memorability, as our participants described creating routes and paths along accessible PoI for maximum ludic engagement.

Interestingly the gift-giving system in *Pokémon GO* offers another avenue to establish the memorability of a stop. Sending a gift reminds the player of the location while sending it to their peers, even fleetingly. Gifts act as mobile traces of the player's engagement with the Location-Based Game, which Özkul and Humphreys [2015] note as being effective in reinforcing memories of the place.

5.1.2 Sponsored Locations: Pushing the Contract. While some sponsored locations are similar to their regular PoI counterparts, they can differ critically. Participants described mismatched PoI images as a major pain point in their gameplay experience, yet sponsored locations frequently use branded images instead of photos and have been positively received. This discrepancy is likely due to the value add sponsored locations offer despite the nuisance costs [27]. To our participants, the value of play rewards and additional ludic opportunities are more valuable than the nuisance imposed by a branded image.

In terms of value, the addition of a single PoI is somewhat minimal, as noted repeatedly by our participants. However, individual dedication to the game appeared to have only a minor impact on the value offered by LGA (RQ3), aligning with extant Location-Based Games research [32]. For participants who habitually play *Pokémon GO*, sponsored locations add more chances to play and a variety to their experience: new places to visit and gym badges to collect. The value added by these play opportunities still depends on the individual, as for some, the nuisance cost generated by the existence of advertising was too great.

5.2 Agency in Location-Based Games

Rather than dedication, positive expressions of player agency were more linked to positive advertising acceptance (RQ2). Agency in the context of LGA is twofold: players are allowed to choose what they interact with, and interactions minimally detract from immersion in the game. Our participants frequently noted Location-Based Game play was incidental and brief: during commutes, while walking the dog, or even during grocery shopping. As a result, time is a premium resource for such players. Latency in interactions decreases the total number of PoI and other in-game elements with which players can interact. If sufficiently long, such delays eventually lead to the players becoming frustrated with the game and quitting it, an observed phenomenon in other ludic contexts [41].

In blending with other game elements *Pokémon GO* LGA respects the player's intent when interacting with the advertisements, supporting the player's agency [29, 41, 46]. Where sponsored locations do visually differ from other PoI on the overworld screen, carrying a small indicator highlighting them as advertisements, they allow the player to choose to interact with the ad, enhancing their agency. Notably, when presented with options that remove player choice, such

as autoplay advertisements, our participants disliked the suggestions unilaterally as they impaired player agency. Johnson [2015] considers the addition of such design elements as an automation of player intent, moving in-game actions away from their intended goal, a violation of agency. Further, the usage of unavoidable video advertisements in sponsored locations would significantly differ from the typical interaction patterns of PoI, violating the contract negotiated between the player and the game.

Supply balloons similarly restrict player time with a timer to enforce an interaction with messaging contained therein. Despite the intent of the timer to increase interaction and memorability, participants were unable to recall in-depth details about supply balloon messaging. Low recall of the messaging may be tied directly to the frustration the timer introduced; participants detested the violation of their temporal agency. The violation was so egregious to some that they even avoided the design element altogether; however, this pain point was insufficient to drive them to delete the game [41]. While the initial interaction with a supply balloon would partially violate player agency, subsequent encounters preserve their agency, now understanding the implications of the affordance.

Notably, LGA providers can overcome the nuisance cost of adding timers or videos to LGA through more lucrative rewards. However, providers should refrain from raising the nuisance cost of their advertisements. Advertising modalities like banner ads violate the capacity for players to tailor their advertising experiences, violating player agency [41]. Furthermore, our participants perceived advertising saturation as "cheap," making the game feel less like a game and more like an advertising platform, degrading their interest. While Location-Based Games can offset the nuisance of such advertising through rewards, there is a yet-to-be-defined saturation point that results in players fully disconnecting from the game.

5.3 Location-Based Game Advertising Design Implications

Our findings carry design implications for LGA providers and Location-Based Game developers. Location-Based Game developers should diegetically integrate LGA design elements into the game's design and avoid around-game advertising implementations if possible. Around game advertising elements, such as banner advertisements, are believed by participants to harm their ability to play the game, increasing nuisance costs [41]. This is certainly the case for map-based Location-Based Games, as UI elements can obscure PoI or other on-map entities. Integration of such elements diegetically into the 3D space of the Location-Based Game may mitigate these nuisance costs. If the player can reconcile the LGA design element with their perception of the game, they more readily accept its inclusion, as seen with sponsored locations and supply balloons. The designer of the Location-Based Game can set the design language of their game; therefore, if there is an interest in including LGA elements, Location-Based Game developers should make affordances early in the game's design.

For example, *Pokémon GO* allows players to dress and accessorize their avatars. Niantic offers players the opportunity to purchase these accessories and earn them through challenges and events. Players may then customize their avatar to their aesthetic preferences as they would select an outfit in physical reality. Modifying their appearance embodies the player in their avatar, furthering feelings of immersion and connection to the Location-Based Game [58]. Similarly, sponsored locations give the players additional ludic options while adhering to the rules of the Location-Based Game. By expanding the player experience, these advertising techniques offset the nuisance costs of the advertising affordance.

5.3.1 Perception of Unequal Value. Vitally, the player should feel as though they gain more than they lose from the value exchange [27, 28]. Participants in our study were savvy to advertising techniques and, while accepting of LGA, were often cautious in their acceptance. This caution appears to originate in wishing to preserve the value they received from the LGA. Participants only asked for increases in rewards and strongly opposed increased nuisance costs without an at least commensurate increase in value offered to the player. Notably, this value exchange need not be fiscally in favor of the player. Properly mitigating nuisance costs, as noted above, allows players to perceive the advertisement as less intrusive; therefore, the LGA may require smaller rewards to make players feel they are benefiting disproportionately.

Location-Based Game Advertising can also manipulate perceptions of value by breaking the rules in favor of players. Today sponsored locations offer players additional rewards and special research over non-sponsored neighbors to employ this tactic. The benefits of sponsored locations resulted in some participants expressing a preference for such PoI, with a typically good recall of their experiences with sponsored locations. Care must be taken, however, in selecting appropriate rules to break in the Location-Based Game's contract. For example, in *Pokémon GO*, the addition of an auto-play ad that provides ample resources to those visiting sponsored locations would likely be poorly received due to the violations of player agency. In contrast, adding a feature, such as enabling sponsored gyms to use lures, would be widely accepted, adding an intrinsic value to the sponsored location.

5.3.2 Physical Hybridization. While the above recommendations affect the player's emotional response to LGA, they do little to mediate purchase intentions and interactions with the business hosting the sponsored location. Limited business interaction is partly due to established communal norms to avoid interfering with places of business and locations where the player feels as though they don't belong [16]. The existence of a PoI in-game does not confer an open invitation to play in the space. Further, while a PoI may improve foot traffic in the area, if the player can access the PoI, there is little incentive to enter a business lest they need something from that store.

To address this, we recommend businesses employing LGA consider two adjustments to their strategy. The introduction of physical artifacts (e.g., posters, banners, stickers) to a space telegraphs that the physical space is open to players. As our participants note, there is an unwillingness to intrude on the space of others when playing the game. A player can overcome this taboo through the presence of physical markers and enter spaces with no fear of reprisal or judgment.

Additionally, a tighter coupling of the in-game advertisements with the business is necessary. Tighter couplings can manifest as in-game rewards for players (e.g., adding QR codes or codes to receipts for in-game resources), requiring players to make in-store

purchases. Expanded promotional campaigns offering real-world discounts can also entice player attraction to sponsored location businesses.

Even still, despite our participants' opinion that all businesses – save adult-oriented ones – can be targets of LGA, not all companies are well suited to LGA. Businesses that perform costly services or sell expensive products may not be the best targets for LGA. Despite our participants' high recall of phone carrier LGA, none recalled purchasing anything. In contrast, the gas station chain Circle K had several participants who noted entering locations and buying gas and snacks while there. Consumer needs are vital to the effectiveness of advertising, and LGA is no different in this regard.

6 CONCLUSION

With the growing popularity of Location-Based Games, LGA represents an essential area for exploration moving forward. Today research pertaining to Location-Based Advertising is common [3, 76, 81], explorations of LGA are comparatively less voluminous. The present research seeks to explore this space in greater detail through a large-scale collection of player sentiments and an in-depth exploration of the lived experience of some of those players. In pursuit of these lived experiences, we conducted semi-structured interviews to probe three core research questions:

(1) Does player interaction with a sponsored location result in recognition of the location's brand?
(2) What models of presentation for Location-Based Game Advertising are acceptable to players?
(3) Does player dedication to the Location-Based Game impact the value of Location-Based Game Advertising?

The aggregated player experiences elucidate several key attributes regarding Location-Based Games and Location-Based Game Advertising:

(1) LGA act as a digital billboard, conveying business details alongside locative information.
(2) Well received LGA enhances the player's agency.
(3) Positive memorability occurs when points of interest match physical reality
(4) Ludic engagement is a mediating factor in the memorability of locations.

The implementation of LGA in *Pokémon GO* is generally well regarded by players of the game, given the present findings. Many of our participants find the addition of sponsored locations to enrich their play experiences, providing new and sometimes ephemeral ludic contexts. Furthermore, while only sometimes effective in driving sales to businesses, sponsored locations and LGA did appear to at least draw people to locations with high densities of PoI.

This work also highlights the importance of the contract negotiated by players and Location-Based Games regarding player satisfaction with the gameplay. While developers may bend this contract to elicit specific responses from the players, reductions in agency negatively impact player sentiments towards the game. Finally, we have outlined some initial best practices for designing LGA experiences for Location-Based Game developers.

6.1 Limitations

Our participant pool for this research was limited exclusively to the United States for interviews. This is an artifact of our collaboration with Niantic, who invited players registered in North America, as they believed this would maximize participant exposure to LGA. While effective in getting participants with existing knowledge of LGA techniques in *Pokémon GO*, researchers should conduct further studies to determine if sentiments are different in other regions of the world. Additionally, we limited our interviews to English language speakers due to staffing constraints. Future researchers must also explore the impacts of language on these perceptions and sentiments.

While we leveraged contacts in Niantic to recruit our participants, interviews were wholly opt-in, possibly biasing our results towards more extreme reactions from participants in interviews. Likewise, our data relies on the participants' self-reported experiences, which may differ from their actions. Future work should observe the material impacts of LGA on businesses that have interacted with it in their operation. Importantly, as Location-Based Game experiences are temporally bounded, these findings must be contextualized as a representation of the state of *Pokémon GO* during the summer of 2022. While broad themes are unlikely to shift drastically, player opinions on designed affordances (such as supply balloons and sponsored locations) may differ based on in-game changes. Additional work in the LGA sphere must reckon with alterations to such affordances when reproducing a study of this nature.

Finally, this work focuses on player reactions to LGA in *Pokémon GO*, and while the design of *Pokémon GO* exhibits similarity to other popular Location-Based Games, such as Pikmin Bloom [49], affordances are typically interpreted through social contexts [55]. The mechanics and designs of the Location-Based Game mediate the precise expression of LGA techniques. However, different Location-Based Game designs result in similar, yet discrete, expressions of player behavior [61]. To whit, *Pokémon GO* emphasizes some player responses to LGA; however, these responses are likely to be similar to other games in the genre. This analysis centers on the lived experiences of our participants, players of *Pokémon GO* in this case. Accordingly, this study resembles others in the Location-Based Game field, building on the extant literature [17, 55, 56, 63]. This work extends the larger discourse about Location-Based Games, focusing particularly on the affordances of in-game advertising and its impact on players of the genre [16, 32]. As such, the reader must interpret this work alongside other discourse regarding Location-Based Games.

6.2 The Future of Location-Based Game Advertising Research

Herein, further research should begin exploring player responses to LGA through design probes. This work observes reactions to existing mechanisms, and as such hypothetical designs must be tested with Location-Based Game players to understand the impacts of LGA more minutely. Additionally, while we have begun exploring player purchase intentions and sentiments, there is room to dig deeper into the concrete impacts of LGA, perhaps through journaling studies involving players of Location-Based Games. Finally,

this work opens up fresh questions in the sphere of LGA. What is the point of diminishing returns for LGA? Do different styles of Location-Based Games support different LGA techniques better? What are new ways of implementing LGA that are effective and well-regarded by players? How can we minimize the harm inflicted by LGA on players of Location-Based Games? These questions add to the growing corpus of research questions in the Location-Based Game sphere beyond the scope of the present work.

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A RECRUITMENT SURVEY EMAIL

Title: We need your help, Trainer!

Hi [trainer nickname],

> We're reaching out to request your participation in an exciting Niantic research study alongside our partners at the Rochester Institute of Technology. Last year, we sponsored the Niantic x RIT Geo Games and Media Research Lab to serve as a focal point for research on geo games and the impact they have on local and global cultures. The goal of this particular research study is to investigate the impact of sponsorship in Pokémon GO. If you're interested in participating, please complete this 7-minute survey. We hope to hear from you!

Thank you,
The Niantic x RIT Geo Games and Media Research Lab team

B INTERVIEW RECRUITMENT EMAIL

Hello!

> Thank you for completing the survey for our study about Advertising in Pokémon GO! Please register at the following link to set up your interview time: Note that interview slots are limited and are first-come, first-serve. If you have any further questions feel free to respond to this email!

C PARTICIPANTS

C.1 Selection Code

```
import pandas as pd

df = pd.read_csv('BaseList.csv', header=None)
shuffled_df = df.sample(frac=1)
",".join([x for x in shuffled_df.head(n=400)[0]])
```

C.2 Participant Information

Interview ID	Code Name	Gender	Age
P01	Adam	Male	25-34
P02	Molly	Female	25-34
P03	Tona	Female	35-44
P04	Kimmy	Female	25-34
P05	Sue	Female	18-24
P06	Jenna	Female	45-54
P07	Link	Male	25-34
P08	Joel	Male	18-24
P09	Becky	Female	35-44
P10	Brad	Male	18-24
P11	Will	Male	25-34
P12	Wendy	Female	25-34
P13	Cindy	Female	35-44
P14	Jack	Male	35-44
P15	Amanda	Female	25-34
P16	Arlene	Female	45-54
P17	Millie	Female	55-64
P18	Marcus	Male	25-34
P19	Dot	Prefer to self-describe	45-54
P20	Nick	Male	25-34
P21	Mark	Male	45-54
P22	Ronald	Male	45-54
P23	Linda	Female	55-64
P24	Aaron	Male	25-34
P25	Tony	Male	35-44
P26	Shayna	Female	35-44
P27	Tom	Male	35-44

Table 1: Interview Participants

D SEMI-STRUCTURED INTERVIEW GUIDE

D.1 Demographics

- How dedicated are you to Pokemon GO?
- When did you start playing Pokemon GO? Why?
- Were you familiar with the Pokemon franchise before Pokemon GO?

D.2 Locations

- Does Pokemon GO impact your daily routine?
- Do you deliberately visit businesses that have a Pokestop or Gym? Why?
- Have you ever chosen one location over another because of the proximity of the location to something in Pokemon GO?
- When playing Pokemon GO do you read about the locations you visit? Why?
- What might incentivize you to read location details more frequently?
- Do you remember where the stops and gyms are in your area?
- Do you use Pokemon GO as a navigational tool?
- Do you perceive Gyms or Pokestops as more valuable?
- Would you rather spend time at a business with a Gym or a Stop?

D.3 Advertising

- Can you describe what a sponsored location is in *Pokémon GO*?
- What Sponsored locations have you noticed in *Pokémon GO*?
- Have you ever read the description for a Sponsored Location?
- Do you think a Gym or a Stop is more impressive for a business to have?
- What do you think of a business that pays money to add its business to *Pokémon GO*?
- Do you view Sponsored Locations as advertising in *Pokémon GO*?
- What kind of advertisement in *Pokémon GO* is too far?
- What about supply balloons?
- Do advertisements such as Sponsored Locations impact your immersive experience with *Pokémon GO*? Why?
- Would multimedia advertisements such as videos negatively impact your experience?
- What if those multimedia advertisements were optional and offered you additional Pokéballs or other items?

D.3.1 Local Advertising.

- Have you noticed any local businesses in *Pokémon GO*that joined in the last two years as a Sponsored Location?
- How did you feel about the local business joining *Pokémon GO*?
- Do you perceive the business as being accepted by Niantic or the Pokémon franchise as a whole?
- Do you like it when businesses lure their stops?
- Do you feel comfortable playing *Pokémon GO* in local businesses?
- Are there any taboos around playing *Pokémon GO* in or around local businesses?
- Do you think you'd be more comfortable playing *Pokémon GO* if the business had a physical sign demarking that you can play *Pokémon GO* here?
- Would you feel comfortable if local businesses reached out to you while playing the game (e.g., talking about the game, asking if you need any trades, or offering you help with completing challenges)?
- What businesses do you think work best as pokéstops?
- Do you think a Stop/Gym is more valuable, or would a supply balloon in the area be more valuable?
- If a sponsored location left the game how would you feel?
- What could be added to sponsored locations to make them more memorable?
- What could be added to make you more likely to patronize the business?
- How do you think your experience would be impacted by Niantic removing Sponsored locations?

E RECRUITMENT SURVEY

E.1 Question 1

This study is about your experiences and opinions on advertisements in games such as Pokémon GO. Your responses will be saved and combined with other participants for statistical analysis. No

personally identifiable information will be preserved in this data set (e.g. IP, Name, etc.).

This study should take approximately seven minutes to complete. Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice. If you would like to contact the Principal Investigator in the study to discuss this research.

If you choose to provide an email it will only be used to invite you to a follow-up interview to discuss advertising in games such as Pokémon GO and not preserved beyond this capacity.

By clicking the button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

- I consent, begin the study
- I do not consent, I do not wish to participate

E.2 Question 2

How do you describe yourself?

- Male
- Female
- Non-binary/third gender
- Prefer to self-describe
- Prefer not to say

E.3 Question 3

How old are you?

- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65+ years old

E.4 Question 4

What best describes your employment status over the last three months?

- Working full-time
- Working part-time
- Unemployed and looking for work
- A homemaker or stay-at-home parent
- Student
- Retired
- Other

E.5 Question 5

What is your highest educational attainment?

- Middle School
- High School
- Associates Degree
- Bachelor's Degree
- Master's Degree
- Doctorate
- Vocational School
- GED
- Other

E.6 Question 6

In which country do you currently reside?

- List of countries (dropdown)

E.6.1 Question 6.a [USA]. In which state do you currently reside?

- List of states (dropdown)

E.7 Question 7

What year did you start playing *Pokémon GO*?

- 2016
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

E.8 Question 8

How many days a week do you typically play *Pokémon GO*?
Numeric input [0-7]

E.9 Question 9

How long do you play *Pokémon GO* a day?

- Less than 15 minutes
- Less than 30 minutes
- 1 hour
- 2 hours
- 3 hours
- 4 hours
- 5 hours
- 6 hours or more

E.10 Question 10

How dedicated of a *Pokémon GO* player are you?

- Very dedicated
- Somewhat dedicated
- Neither dedicated nor indifferent
- Somewhat indifferent
- Very Indifferent

E.11 Question 11

How hardcore of a player are you?

- Very casual
- Somewhat casual
- Neither hardcore nor casual
- Somewhat hardcore
- Very hardcore

E.12 Question 12

Would you shop at a store because it had a Pokéstop or Gym?

- I only shop at stores with Pokéstop or Gyms
- I try to shop at stores with a Pokéstop or Gym
- Pokéstop and Gyms don't affect my shopping choices

- I try not to shop at stores with a Pokéstop or Gym
- I never shop at stores with Pokéstop or Gyms

E.13 Question 13

Would you eat at a restaurant because it had a Pokéstop or Gym?

- I never eat at restaurants with Pokéstop or Gyms
- I try not to eat at restaurants with a Pokéstop or Gym
- Pokéstop and Gyms don't affect my restaurant choices
- I try to eat at restaurants with a Pokéstop or Gym
- I only eat at restaurants with Pokéstop or gyms

E.14 Question 14

Have you received a sponsored supply balloon in *Pokémon GO*?

Note: This is where a business pays to have a supply balloon with a message in-game.

- Yes
- No

E.14.1 Question 14.a [yes]. How frequently do you open sponsored supply balloons?

- I never open them
- I sometimes open them
- I open them every other time
- I frequently open them
- I always open them

E.14.2 Question 14.b [yes]. How frequently do you read the message in sponsored supply balloons?

- I always read it
- I frequently read it
- I read it every other time
- I sometimes read it
- I never read it

E.15 Question 15

Have you been to a sponsored Pokéstop or Gym in *Pokémon GO*?

Note: This is where a business pays to have a location in-game.

- Yes
- No

E.16 Question 16

What businesses have you visited that had a sponsored Pokéstop or Gym?

- McDonalds
- Verizon
- Sprint
- Other

E.17 Question 17

How do you feel about businesses sponsoring Pokéstop or Gyms in *Pokémon GO*?

- I dislike it
- I somewhat dislike it
- I neither like nor dislike it
- I somewhat like it
- I like it

E.18 Question 18

How likely are you to visit a business that sponsored a Pokéstop or Gym?

- Very likely
- Somewhat likely
- Neither likely nor unlikely
- Somewhat unlikely
- Very unlikely

E.19 Question 19

How do you feel about advertisement in *Pokémon GO*?

- Not acceptable at all
- Slightly acceptable
- Moderately acceptable
- Very acceptable
- Completely acceptable

E.20 Question 20

How frequently do you read Pokéstopor Gym information?

- I never read it
- I sometimes read it
- I read it every other time
- I frequently read it
- I always read it

E.21 Question 21

Please add your email if you wish to be contacted for a Zoom interview on Location-Based Advertising in Pokémon GO. You will be compensated with in-game rewards (valued at 25 USD) for your time.

Optional Email Address Input