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A Game of Dark Patterns: Designing Healthy, Highly-Engaging Mobile Games

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ABSTRACT

Gaming is a more accessible, engaging and popular past-time than ever before. Recent research highlights games as strikingly effective means of capturing and holding our attention – so effective, some argue, to the point of deleterious effect. An impassioned CHI2021 panel discussion directed these efforts towards the ethics and adoption of dark patterns. And yet, we know little as to how dark patterns are perceived and arise in the design, development and use of games. This paper seeks to address this knowledge gap by recounting findings from a design-led inquiry comprising interviews and workshops conducted with mobile game players, designers, developers, and business developers. We contribute an understanding of how dark patterns arise in the development, use and commercialisation of mobile games, their effects on players and industry professionals, and means for the consideration, negotiation and navigation of these strategies for gamer-engagement by design – in support of healthier, highly-engaging game experiences.

CCS CONCEPTS

• **Human-centered computing;**

KEYWORDS

HCI, design, mobile, games, dark patterns, wellbeing, engagement, development

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1 INTRODUCTION

Gaming is today a source of pleasure and joy for many more among us than ever before; an activity, hobby and culture at the same time relaxing, stimulating, social and uplifting. The now near-ubiquitous nature of mobile devices in particular has transformed gaming from an activity bound in large part to the home console or computer, to a means of passing the time accessible to many, anywhere and at any time. Mobile gaming has proved a means and medium of engaging all ages and demographics[41], accounting for a significant percentage of all screen time, and in turn gaming market share; generating vast profits for game development studios, and driving new, highly-engaging and lucrative game design paradigms, ‘gacha,’ ‘casual’ and ‘hyper-casual’ in nature [41].

While much research points to the benefits of gaming - as a past-time like many others, relaxing, social, educational and even therapeutic - others have highlighted the capacity of highly-engaging games to induce harm; adversely impacting individuals’ wellbeing in terms economic, social and psychological [9, 46].¹ Recent public and policy attention has focused on game mechanisms considered to place players at increased economic risk; including in particular micro-transactions and loot-boxes now designated gambling in certain legal jurisdictions [6, 38, 59]. This public attention has equally highlighted the capacity of highly-engaging games to adversely impact particularly vulnerable populations [9, 46]; surfacing numerous accounts of young children’s spending of tens of thousands of US dollars on casual mobile games [3, 14, 32, 39, 48, 50, 55], and the description of certain players as ‘whales,’ enthusiastically sought after by game studios for their vast monthly spending [16]. Many of these critiques can be related to broader criticisms of digital technology as detracting from daily life, reducing autonomy, serving as distraction, and manipulating thoughts and behaviour – often leading to polarised discussion of personal, social and corporate responsibilities across public media, online fora, and the academic literature alike [43–45, 49].

Human-computer interaction (HCI) researchers attempting to understand the design and impact of mobile games have turned to the identification and description of ‘dark patterns’ employed

¹The concept of technology - including gaming - addiction, although not our focus here and remains intensely debated, is broadly considered an unfounded and misleading narrative by many HCI researchers [28, 29].

by designers and developers, collectively game creators (GCs), for the engagement of players — design strategies yielding experiences against users' best interests and often eluding their awareness or consent [58]. Prior research has focused on the development of definitions and ontologies of dark patterns [21], including not only loot boxes but playing by appointment, grinding, reciprocity, and many more. These design patterns are often posited as a result of the nature of game development as not only a creative but commercial process comprising practices of design, implementation and user testing driven by quantitative data and business metrics including retention rates and lifetime value measures [7, 53]. The adverse effects of highly-engaging game experiences are often then described as an inevitable consequence of the adoption of dark patterns in the pursuit of a profit motive. A richer understanding of the adoption, implementation and use of dark game design patterns may yet however allow us to facilitate and prioritise the ethical design and development of digital technologies of all kinds.

And yet, we currently know little as to how we might design to support healthy, highly-engaging game experiences. This is a challenge significantly complicated by twin ethical dilemmas at the heart of the experience and adoption of dark patterns. The first pertains to the degree of personal responsibility and autonomy granted to players in weighing questions of ethical engagement. As one indie game designer put it; “*different kinds of experiences are meaningful to different people, and ... we shouldn't judge people for what is meaningful to them*” [12]. The second, less studied, concerns the involvement of multiple stakeholders in the design, development and commercialisation of mobile games. While some have argued that the only solution to the adoption of manipulative design patterns is to “*shame the developers away from using them*” [34], such moralising in practice tends not only to lead to polarised conversations but may also serve to mask the complex combination of values at play in the process of highly-engaging game design — an industry practice into which researchers currently possess little insight. Industry professionals have commented that the “*responsibilities (for digital wellbeing, ed.) lie everywhere and with everyone*” [33]. To what extent is this the case, and what might this look like in practice?

This paper seeks to address this knowledge gap in support of the design of healthy, highly-engaging game experiences, by developing an understanding of a) how dark patterns are experienced by mobile game players, b) the role of diverse industry stakeholders in crafting dark patterns, and c) how we might in fact design to shape the adoption and experience of dark patterns in support of wellbeing. We recount findings from a design-led inquiry comprising interviews and design workshops conducted with a diverse sample of mobile game players, GCs and business developers (BDs); contributing an understanding of just how dark patterns arise in the development, use and commercialisation of mobile games, their effects on players and industry professionals, and means for the consideration, negotiation and navigation of these strategies for gamer-engagement by design — in support of healthier, highly-engaging game experiences.

2 RELATED WORK

This work takes place at the intersection of three key HCI research threads; concerning design for user engagement, the implementation and ethics of dark patterns, and digital wellbeing.

User Engagement. Much HCI research in recent years has focused on the engagement of users [15]. With respect to gaming alone, researchers have applied psychological theory to persuasive game mechanics [31], studied engaging collaborative play [60], and explored players' motivations for gameplay [23]. Within the gaming industry, the realisation of highly-engaging game experiences is the ultimate aim of most game creators, for reasons both creative and economic. And it is through games, and strategies of gamification, that we have often proved most successful at engaging users [44]. User engagement design is supported by a wide variety of strategies, measures and theories, including and often most prominently, self-determination theory [17, 27] and flow theory [24, 26, 35]. Cowley et al. posit that games are particularly suited to generating experiences of flow, noting that “games give immediate access to their inherent potential for optimal experience, and that potential is facilitated by the structured nature of further gameplay” [11]. Gaming is therefore a domain in which we have proved strikingly successful at designing for engagement.

Dark Patterns. So successful in fact that some have begun to worry about the ethical ramifications, and practices of ethical decision-making, entailed in the process of game design. Recent years have seen increased attention devoted, in particular, to the topic of dark patterns [42]. Much of this work has focused on identifying, defining and categorising strategies considered misleading, manipulative or even coercive. And yet developing an ontology of dark design patterns is itself far from an easy task; the effects of these strategies dependent on a wide variety of individual characteristics, and their definition morally-contingent. Zagal et al. comment, for example, that game design patterns are best thought of as ‘value-neutral tools’ yet admit that this “does not necessarily make them useful for identifying problematic or unethical design choices made by designers” [58]. Recent efforts by HCI researchers to further our understanding of the relationship between GCs' intentions and players' experiences include assessment of the impact of dark patterns on users [13, 20, 36, 56] and the creation of new guidelines for GCs [1, 34, 47]. Lukoff et al. suggest new design norms as means to mitigate the effects of dark patterns; including shaming companies which employ dark patterns, requiring GCs to articulate the ethical values underlying their design practice, and incorporating material concerning dark patterns into design curricula. Fitton & Read similarly offer a framework to support critical consideration of dark patterns in the creation of free-to-play games, to be employed during game design to “help creators of free-to-play apps focus on the experience and wellbeing of younger users even when monetization is essential” [18].

Digital Wellbeing. Questions of ethical user engagement and design then hinge on conceptions of what it means to be well. And much HCI research has focused on the topic of digital wellbeing in recent years, producing new measures [25, 37], implications for design [8, 19, 22, 40], and the application of new lenses to gaming research, including emotional regulation [10, 51, 54] and life satisfaction perspectives [57, p 16]. Significantly, studies suggest

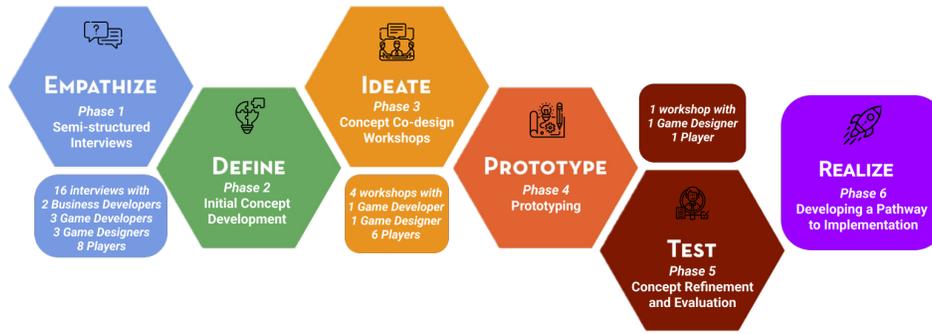


Figure 1: The Design Research Process Followed

that both positive and negative emotions alike shape and aid in producing good player experiences [30].

These overlapping research threads then together surface the question: Is it possible, and how might we, develop game experiences both ‘healthy’ and ‘highly-engaging?’

3 METHOD

Through this work then, we aimed to develop an understanding of players’ and GCs’ experiences of dark patterns, just how these design patterns come to exist, and how we might support and practice design to realise healthy highly-engaging mobile game experiences.

To generate and leverage insight into these complex problems, we adopted a design research approach entailing stages of qualitative research, divergent ideation, convergent prototyping, and testing; inspired by the Stanford d.school’s five-stage model (See Figure 1). First, 16 individual semi-structured interviews allowed us to empathise and identify common themes across participants. Divergent brainstorming and mind mapping exercises then enabled the generation of concept solutions to the challenge of designing healthy, highly-engaging games. These were expanded and iterated upon together with stakeholders during the co-design workshops of phase 3 - four workshops conducted with participants in pairs - and then further developed and refined using knowledge and insight from these interactions during phase 4. In phase 5, stakeholders were again consulted during workshops for the iterative co-design, testing and validation of these concepts. And finally, we added a sixth phase, during which a coherent strategy to support communication and translation of the outputs and design implications of the research project at scale and in practice was developed.

Participants for this project included 13 mobile game players (PLs), 3 professional game designers (DSs), 3 game developers (DVs) and 2 BDs, recruited through social media (Reddit, ResetEra, Twitter and Facebook), LinkedIn, university intranet, and convenience sampling of personal, professional and academic networks (See Table 1). This was a diverse sample of stakeholders, the engagement of whom we considered an equally important design challenge in the planning and conduct of this research.

Participants ranged in age from 22 to 40; with an average age of 30. On average, GCs and BDs played mobile games for 31 minutes per day, while players played an average of 136 minutes per day. Two GCs described playing games once a day, while the other GCs

Table 1: Participant Demographic Characteristics (in order of participation)

ID	Age	Gender	Location	Time spent playing daily
PL1	33	Female	N. America	3-5hrs.
PL2	22	Male	Europe	1-2hrs.
DV1	26	Male	Europe	5-10min.
DS1	29	Male	Europe	1-2hrs.
PL3	24	Female	Europe	30-60min.
DS2	30	Male	Europe	10-30min.
DV2	25	Male	Europe	10-30min.
PL4	37	Male	Asia	5-7hrs.
DS3	35	Male	Europe	30-60min.
DV3	28	Male	Europe	1-5min.
PL5	28	Male	Europe	3-5hrs.
PL6	36	Female	N. America	30-60min.
PL7	40	Male	N. America	10-30min.
PL8	25	Other	N. America	30-60min.
BD1	30	Female	Europe	10-30min.
BD2	30	Male	Europe	30-60min.
PL9	32	Male	Asia	5-7hrs.
PL10	29	Male	Europe	3-5hrs
PL11	24	Female	Europe	5-10min.
PL12	24	Female	Europe	10-30min.
PL13	28	Male	Europe	1-2hrs.

and BDs played games occasionally. Players, on the other hand, all played multiple times a day, with the exception of three; two playing once a day and one only occasionally. All GCs and BDs resided in Europe, while only three players did so, four living in North America and one in Asia. All participant interactions took place over Zoom, and were organised using email and Discord, as a result of the COVID-19 pandemic. We employed the virtual work-space tool Miro to support the creation and use of several novel visual research methods for the reciprocal activation and creative engagement of participants in co-design. This included, for example, an ice-breaker and needs-finding exercise entailing the sorting of dark patterns (See Figure 2), and another involving the

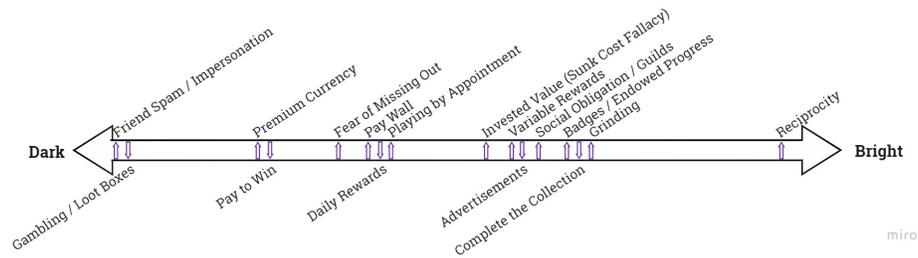


Figure 2: Absolute Ranking of Dark Patterns' Impact (showing the average ranking across all 4 workshop participant pairs)

interactive placement of initial concept solutions according to axes of perceived value and feasibility.

Interviews and workshops were envisaged to last an hour although often ran longer, participants eager and willing to share their insights. All data captured was fully anonymised, and participants provided an information sheet communicating the research procedure, objectives, and handling of data as well as a short and anonymous demographic questionnaire in advance of each study phase. Digital notes were taken by both participants and researchers during these workshop exercises, interviews audio-recorded, anonymised, transcribed in full, and analysed using a combination of visual network analysis and Braun & Clarke's method of thematic analysis entailing the inductive and iterative generation of codes followed by cross-cutting themes; as comprise the key findings articulated in this paper [4, 5].

4 FINDINGS

The findings of this work highlight three themes in particular; players' experience of mobile games and dark patterns, industry professionals' perceptions as to how dark patterns arise and who's responsible for them, and how knowledge of the presence of tension, conflict and conversation at the heart of mobile game design practices might enable us to move closer towards the design of healthy, highly-engaging game experiences.

4.1 Gaming; A Guilty Pleasure

Players spoke of mobile gaming as part of everyday life, past-time, and identity; engagement motivated by social connection, relaxation, and a desire to escape reality. Many participants commented on the accessibility of mobile games as generating broader appeal, bringing "a lot of other people into gaming that otherwise wouldn't" (PL7), and even extending the target audience for hyper-casual games to "everybody from 10 to 90" (DS1). Although almost all participants spoke of positive and fun experiences with mobile games, many shared also negative perceptions of the medium, commenting on manipulative practices, 'industrial greed,' exploitative monetization and a feeling of 'burnout,' leading to a felt need to limit playtime. Players then spoke as knowing, yet also striving to distinguish in practice, between healthy and unhealthy game experiences; "I wish I were playing them less. I've tried ... I'm trying" (PL1).

Asked about dark patterns, many players expressed a lack of familiarity with the term, although were able to easily identify mechanics meeting the definition encountered during game play.

The patterns most often identified and discussed by participants included Pay to Win mechanics, Playing by Appointment, Daily Rewards, Artificial Deficit, Invested Value (Sunk Cost Fallacy), Gacha mechanics, and Loot Boxes [52]. Many participants spoke of these mechanics as frustrating, eliciting a sense of being cheated, and situated in the context of an adversarial relationship between game professionals' striving for profit and players' desiring to avoid manipulative monetization. And yet, participants also commented that not all patterns were equally 'dark,' and some only so when implemented in combination with other mechanics, otherwise supporting positive and fun experiences; "there's not a moment when like this is good and this is bad. The small tricks you make, and the small economy changes you make to the prices and to the timing, etc. [define] how exploitative or harmful these things are" (DS3). Participants unanimously agreed however that gambling mechanics including loot boxes and practices of impersonation were among the darkest patterns in mobile game experiences (See Figure 2). And yet, many players admitted to willingly and often engaging with loot boxes in their favourite games, enjoying the time spent with these mechanics while warning others away.

4.2 The Road to Dark Design Is Paved With Good Intentions

This raises the question then as to how dark patterns arise, and who's responsible for them. Some GCs argued that dark patterns could simply be 'stumbled' upon or 'fallen' into, whereas others spoke of these patterns as intentional, immutable and inescapable design choices driven by market forces beyond their control; "We have ads every 30 seconds. That's a lot, right. We do it because that's what everyone else does. I cannot afford to only show an ad every minute" (BD1). This trend was therefore described by GCs as motivated not by greed but a desire to remain working in the mobile game industry. GCs and BDs also spoke of dark patterns as arising as a result of data-driven engagement metrics, as surfacing inevitably over time, as related to other drivers of engagement, and as a consequence of a culture of disposable experiences; "I'm going to do everything I can to make sure that you stay here and you click on [our game] again ... I know that you don't actually care about this stuff I've made, you just try to distract yourself" (DS2).

When it came to the attribution of responsibility however, perceptions varied significantly among stakeholders. For some, including players themselves, 'dark patterns exist because they work,' and would only evolve if players were to stop engaging with such games or legal frameworks were instituted against these practices. Some

BDs defended certain patterns, including in-game purchases, as increasing the options available to players; “It makes it possible to create deeper layers inside of the game” (BD1). Others returned to the inevitability of dark patterns given market forces, reflecting a diffusion of responsibility possibly attributable to a bystander effect [2]. A small minority of GCs however counted themselves responsible, and expressed deep discontent with “very exploitative forms of game design” (DS3). DV3, in particular, spoke of a consistent pattern of what they considered ‘trickery’ in game design as motivating their departure from the industry, “sick of developing those games.” For the majority of participants however, responsibility was to some extent shared among players, parents, GCs, and industry figures, noting that it was not always a design pattern that was itself dark by nature but rather its implementation. Prior definitions of dark patterns tend to relate their presence to intentional decisions autonomously made by technology creators [58]. Participants’ comments suggest however that we might also find value in defining the ‘dark game design pattern’ as *a pattern or combination of patterns implemented in such a way that it drives players towards experiences negatively affecting their wellbeing*.

4.3 A Lack of Communication Leaves Us All In The Dark

This process of research and design provided insight into the inner workings of the mobile game industry. And the development of hyper-casual games in particular was found to present a variety of highly-unique features. These are games often developed in a period as brief as two weeks (DS1), each kept as simple as possible in terms of theme and gameplay, and focused around only one or two gameplay mechanics; allowing these games to be easily understood, and immediately satisfying to play. Such games were described by creators as the result of a ‘super data-driven’ approach designed to keep players in a hyper-casual loop, and easy to play to the extent that winning becomes trivial.

Many hyper-casual game studios work under a publisher, which additionally helps developers to inform their design choices using data gathered from the “successes and failures of thousands upon thousands of games” (DS1). This further enables not only the dissolution of responsibility for design choices, but makes it difficult for individual stakeholders to make their voices heard. This was reflected most starkly in participants’ comments as to the implementation of monetization in mobile games as a point of tension and conflict between different professional roles within development studios, as between studios and players. Many game designers and developers spoke openly of their games and gaming as being ‘corrupted’ by their colleagues in business development, and of fighting against the inclusion of these practices; “every game ... started out as people with a passion for a thing ... and as it keeps going, it turns into a company thing, ‘how do we make more money?’ ” (DV2), “it was ‘us against the business guy’ ” (DS3). Although the implementation of dark patterns might therefore be characterised as a conversation, it is one in which GCs described themselves as having little voice; “you know what I would say if they invited me. That’s probably why I’m not invited” (DS2).

The creation of healthy, highly-engaging mobile game experiences then hinges in part on each stakeholder’s ability to make their

voices heard, and in relation to the game economy in particular; one designer describing “the majority [of mobile games]” as “healthy ... just wrapped in unhealthy wrapping paper ... in order to make money” (DS1). Monetisation practices adverse to creators then inevitably drain creativity and detract from the felt meaning of GCs’ work; “you sorta lose the passion when you’re making those games” (DV3). This suggests the value of weighing monetization as a design process and practice in itself, and of striving to create value through monetization — enabling game developers to innovate new, more creative and potentially less predatory monetization strategies.

Several participants commented that monetization elements could even enhance the game experience, or add new aspects to a game, as in the case of the ‘battle pass’ model which allows players to pay money to gain more rewards while playing, providing “constantly a feeling of earning something” (DS2). Players then also should equally not be excluded from these conversations — ethical game development a user-centred process in itself.

5 DISCUSSION

Dark patterns then shape not only players’ but GCs’ and BDs’ experiences of mobile games and their development. And, we undertook this user-centred design research process with the aim not only of generating insight into these strategies and practices, but of enabling and practising design to support healthy, highly-engaging mobile game experiences.

5.1 Practising Design to Support Healthy Highly-Engaging Game Experiences

The early phases of this process led to the proposal of numerous unique tools, methods and materials in support of this goal. Discussion, interaction and evaluation of 6 of which with stakeholders led to the selection and refinement of 3 final concept solutions deemed feasible, valuable, and which might realistically be adopted and implemented in practice — each approaching the problem of healthy highly-engaging game design from a unique perspective.

A Dark Pattern Badge. Our first concept entails an illustrated badge system, integrated across app stores to inform players of the dark patterns present within a game before its download — enabling players to make more informed choices and preparing them for the mechanisms to which they are likely to be exposed. This concept then provides increased transparency around the design and impact of dark patterns, inspired by players’ comments as to a lack of awareness of the dark design patterns a game could contain (See Figure 3). Considerations in the design of this concept included prioritising core principles of glanceability and legibility, enabling access to multiple levels of information, and avoiding explicit moralisation. A unique icon was created for each dark pattern; the type of pattern (temporal, monetary, social or psychological) denoted by a coloured border, and these icons displayed as a stack. Clicking an icon would result in the presentation of a more detailed description to users, facilitating the education of players over time including in regard to the effect of multiple patterns in combination — an interaction highlighted by players as key to their impact. By simply listing those patterns present, this concept attempts to refrain from granting weight to the often-polarising nature of the public and professional debate regarding dark patterns.

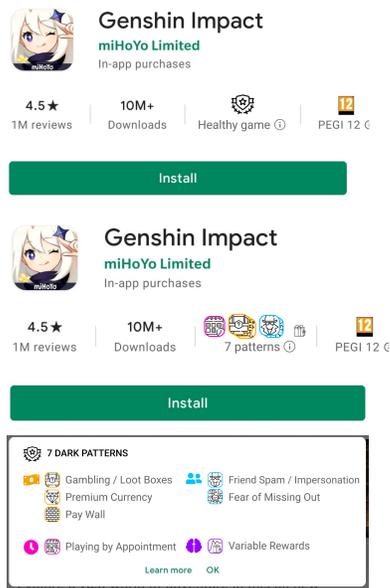


Figure 3: The Final *Dark Pattern Badge* System Design. Top: The stamp when no dark patterns are present. Middle: The store page when dark patterns are present. Bottom: The dark pattern badge information pop-up.

A Healthy Game Design Course. Findings of this work highlighted GCs’ striving to create and participate in conversations around more ethical practices of monetization, yet also a lack of confidence and knowledge among GCs in contrast with BDs. Our second concept takes the form of a Healthy Game Design Course designed to grant GCs the knowledge, tools and skills to implement new and alternative monetization design patterns in co-operation with other industry professionals. This concept was communicated drawing inspiration from standardised university course descriptions. Our workshop participants envisioned a workshop format as most effective, during which students would learn about dark patterns and possible alternate monetization strategies, actively engage in design problems, analyse games containing dark patterns, and work on healthy alternatives in groups. This course would additionally make use of real-world examples to simulate production conflicts, providing creators the tools to participate in such discussions on more equal terms, and in this way contributing towards more ethical practices of monetization.

An Emotion Assessment Toolkit. GCs and BDs all agreed that it is core gameplay which ultimately comprises the heart of any highly-engaging game experience, and that although mobile game design is often a ‘super data-driven’ process, GCs often lack insight into the impact of their choices on players; which can lead to the inadvertent implementation of dark patterns. Our final concept comprises an Emotion Assessment Toolkit designed to elevate developers’ knowledge of players’ experiences, leveraging not only interaction logs and retention rates but ecological momentary assessments of players’ mental states as means to inform practices of decision-making in support of healthy highly-engaging game experiences. Key considerations in the design of this tool were the

questions posed to players and considered useful by developers as means to both generate knowledge and foster empathy with players. During workshops, participants were asked to rank a variety of emotional states in regard to their value for informing game development. GCs selected as most valuable the negatively-valenced emotions ‘annoyed’, ‘disappointed’ and ‘manipulated’, and the positive emotion ‘interested’. Participants highlighted ‘interested’ as a felt experience “very unique and hard to achieve,” (DS3) and therefore an indicator of healthy engagement, and the negative emotions chosen as among “the most unintentional things that might happen in the game,” (DS3) noting that a game would never strive to entice such feelings in players, whereas other negative feelings, such as ‘frustrated,’ could often be intentionally elicited to drive further investment from players.

5.2 Translating Insights & Implications into Practice

The value of these three concept solutions lies not only in their final form but in the shared vision of ethical game design they promote and support; to empower players through increased transparency of game mechanics, educate and raise awareness among GCs of dark patterns, and better inform GCs of players’ experiences, throughout the conception, creation and consumption of mobile games. We advise researchers seeking to support such practices by design to; a) elevate game players’ capacity to transparently weigh the presence and impact of game design patterns, as a means to combat manipulative monetization mechanics, b) empower all stakeholders of game play and design to make their voices heard, overcoming siloed mentalities and adversarial relationships, in support of the development of an ethical gaming culture, and c) increase GCs’ capacity to access rich and diverse forms of knowledge about players’ experiences, beyond data driven-design. The findings and reflections of this work are best considered one contribution to this very conversation, in support of new opportunities to realise healthy, highly-engaging mobile game experiences.

6 CONCLUSION

This work is not only about gaming but about how manipulative patterns arise in technology design, shape our experiences, and might be surfaced and navigated through practices and processes of communication, conversation, and co-design, bringing players, developers, designers and business developers together, elevating consciousness of each stakeholder’s responsibilities, and in turn supporting healthy, highly-engaging mobile game experiences by design.

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