The Guardians: Designing a Game for Long-term Engagement with Mental Health Therapy

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Abstract—This work introduces The Guardians: Unite the Realms, a novel free-to-play and publicly released mobile game that encourages the adoption of healthy real-world behaviours in exchange for rewards that enrich the gaming experience. We describe the game, its grounding in a mental health therapy known as behavioural activation, and how we designed it to keep players engaged over time. Instead of using traditional digital health gamification techniques such as badges or leaderboards, The Guardians creates a motivational pull by embedding the therapy into a complete mobile game. In-game items earned via the therapy have an immediate purpose in the game and, thus, they are considered intrinsically valuable by players. Analysis of game interaction data from 7,782 real-world users suggests 15-day and 30-day retention rates of 10.0% and 6.6%, respectively, which is more than double the average retention levels of most digital mental health interventions. Furthermore, players reported completion of a healthy real-world task on 69.0% of days played (37,574 completed tasks in 54,461 total days). We also report interaction metrics with game features and the effectiveness of the players’ chosen real-world activities.

Index Terms—digital mental health interventions, mobile game design, serious games, real-world user data, well-being, behavioural activation.

I. INTRODUCTION

Levels of mental health conditions – such as depression and anxiety – are rising globally, with rates accelerated by the COVID-19 pandemic, and healthcare systems struggling to meet the increased demand for mental health services [1]. Digital channels provide an accessible and scalable route for delivering evidence-based psychotherapy protocols to those in need. However, despite the growing availability of digital mental health interventions (DMHIs), most apps suffer from low user retention when released in the wild [2].

To address this challenge, we developed and released The Guardians: Unite the Realms1 – a free-to-play mobile game that incentivises players to regularly complete healthy real-world tasks in exchange for in-game rewards (virtual pets and other game items) that have immediate and intrinsic value in the game (Fig. 1). The design of the mental health intervention in our game is informed by behavioural activation theory – an evidence-based framework that helps individuals to reduce depressive symptoms by encouraging them to engage in adaptive and pleasant behaviours [3], [4]. Importantly, surrounding this intervention is a full game experience, with a rewards mechanism that we distinguish from gamification – a design pattern that is often used in digital health [5]. While both gamification and The Guardians reward players for taking real-world actions, the realisable value of these rewards to a user is considerably different, both in nature and extent. This difference in value can be explained by how the rewards are integrated into the user experience. In gamification, rewards have cosmetic value; for example, a player might receive a badge or see their name on a leaderboard. However, the rewards are rarely given intrinsic value in the mechanics of the digital experience, leading some to argue that many implementations of gamification are superficial [6], [7]. By contrast, in The Guardians, rewards are designed to add to the depth and enjoyment of the gaming experience. By acknowledging factors such as challenge, fantasy, and curiosity that make games inherently motivating [8], [9], rewards in The Guardians are designed to further a player’s goals within the game. The rewards are therefore given a context and inherent value predicated on how they enable the player to further indulge in the challenge, fantasy, or curiosity of the game. Furthermore, as the values of these rewards can be immediately realised by the player after completing their task, they do not need to account for delayed gratification when assessing the cost-benefit of taking healthy real-world actions.

This paper makes three main contributions. First, we describe the design of The Guardians, with details of its mechanics, narrative and intended player experience. Second, we

![Fig. 1. The Guardians (left) grants players in-game rewards that further their goal of completing the game in exchange for completing healthy real-world actions. This has parallels to typical mobile games (right), where players must watch ads or pay money to receive in-game rewards.](image-url)
present an analysis of real-world engagement with the game and its underlying therapy protocol based on data from 7,782 players. Finally, we present an analysis of interactions with specific game features and the effectiveness of the chosen real-world tasks on player well-being. We hope these analyses will provide interesting insights to audiences interested in advancing game design for mental health interventions.

II. RELATED WORK

A. Engagement with Digital Mental Health Interventions

Digital channels provide a way to scalably deliver established mental health therapy protocols to those in need. However, engagement with digital experiences and adherence to the protocols they administer are critical challenges. A recent review of real-world mental health app usage by Baumel et al. [2] suggests that across a sample of 93 mental health apps (with median total installs of 100,000), median Day-N retention rates at 15-day and 30-day stages were only 3.9% (IQR 10.3%) and 3.3% (IQR 6.2%), respectively. Baumel et al. propose that because digital mental health interventions (DMHIs) require users to manage their health away from traditional care settings such as face-to-face therapy, the experiences must compete with other stimuli in everyday life, including other digital media. Furthermore, many other contextual factors – such as the nature and severity of a user’s mental health symptoms and the extent the intervention is tailored to individual characteristics and preferences – can influence user engagement patterns with DMHIs [10].

The concept of engagement with digital media has been explored at length in both the game and digital health literature [11], [12], [13], [14]. It represents a multi-faceted construct, with behavioural, cognitive, and affective dimensions, which vary in strength over different time periods (e.g., within a usage session versus across multiple sessions). Combined, these components associate with different profiles of user retention, for example long-term users versus immediate churners. Furthermore, they contribute to more subjective sensations of engagement, such as immersion, presence, and flow, that a user feels as they partake in the digital experience [11], [13].

In DMHIs, the notion of effective engagement is of additional interest. It refers to forms of engagement which correlate with achieving the intended health outcomes, rather than simply any form of engagement [12]. To isolate it from more general manifestations of engagement requires a more nuanced study, using data free from biases that might modify engagement behaviours such as clinical trial protocols and incentives [15]. To achieve this, several experts have called for more transparent real-world reports on DMHI usage, where multimodal data streams are assessed to identify the optimal doses, effective features and mechanisms of action the correlate with intervention effectiveness [11], [16], [17].

B. Video Games and Gameful Design

Humans engage deeply with video games. This engagement is created as video games are intrinsically rewarding, providing players with situations and challenges which help them to feel immediate senses of competency, autonomy, and relatedness [9], [18]. In turn, this motivates players to play the video game more, as humans are more motivated to take actions in contexts where they feel they will have an effect on outcomes – a phenomenon addressed by Self-Determination Theory [19]. Central to creating scenarios of such psychological poignancy are the game mechanics and the patterns of player dynamics they invoke. Therefore, through careful engineering of challenges, feedback and progress, a game designer can create an experience that keeps a player’s long-term interest, rewarding them for their curiosity, dedication, and mastery.

Such impressive outcomes on human behaviour have thus led many to introduce game features into more serious contexts such as health management [20], [21], [22], [14], a trend referred to as gameful design [23]. These efforts have been conducted at a variety of scales, from gamification [5], which uses game components such as leaderboards or badges to bring excitement to non-game systems but does not introduce a full game mechanic, to serious games [14], [13], which employ a full game mechanic but where the narrative and gameplay is tailored to real-world contexts such as lifestyle management.

Notable examples of game-like systems with mental health applications include SPARX – a fantasy game that provides players with an interactive cognitive behavioural therapy (CBT) experience [24]. SuperBetter is another example, which promotes building resilience by integrating features such as power-ups and quests into the real-life story of the player [25]. Finally, EndeavorRx is a game for individuals with attention-deficit hyperactivity disorder (ADHD) which makes cognitive and motor skill exercises more enjoyable [26]. Several recent review papers provide further detail on the use of gameful design in mental health contexts [22], [20]. The Guardians: Unite the Realms is distinct from this previous work as, to the best of our knowledge, it is the first time behavioural activation theory has been embedded into a free-to-play mobile gaming experience and deployed publicly.

III. DESIGN AND DEVELOPMENT OF THE GUARDIANS

The Guardians: Unite the Realms was designed to incentivise real-world tasks via a rewards mechanism (Fig. 1), where rewards are given context and value via their central purpose in the broader game mechanics. This has parallels to rewards mechanisms in traditional mobile games, but differs in how a player earns a reward: they complete activities to manage their well-being, rather than spend money or spend time watching ads. In The Guardians, rewards consist of pets – characters that complete in-game missions – and other virtual currency, such as items that boost the experience points (XP) gained from missions. By collecting these rewards, a player can progress further in the game and interact with more of its features.

To make the game appeal to a diverse audience, we chose a genre where a player’s progress is not determined by dexterity or quick reaction times. Moreover, we wanted to create a

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2This version of the game – The Guardians: Unite the Realms – is informed by, but different from, a previous iteration of the concept that incentivised daily diary completion and was assessed in a private clinical trial setting [27].
eudaemonic gaming experience and narrative to evoke positive feelings for players, such as productivity, motivation and inspiration. Therefore, we designed The Guardians as a pet collection strategy game, where players collect and level up pets by sending them on missions with an end-goal to free each realm’s Guardian from evil characters known as Scorians. The general gameplay and behavioural activation features of The Guardians are presented in Figs. 2 and 3.

A. Embedding Behavioural Activation into a Game

A critical design challenge for The Guardians was how to embed the behavioural activation protocol. Behavioural activation (BA) is an evidence-based psychotherapy that helps individuals to reduce depressive symptoms, through a combination of features including tracking perceived correlations between mood and activities, engaging in adaptive activities, and receiving psycho-education [3], [4]. Depressive mood can persist due to an individual’s disinterest in engaging in pleasant activities (i.e., anhedonia). BA functions to counteract this inertia by encouraging patients to engage in pleasant activities that are initially discordant with mood. Eventually, after consistent practice, patients enjoy engaging with pleasant activities again. Conventionally, BA has been administered with a therapist in-the-loop to guide and motivate individuals through the process. However, more recently, self-help digital versions of the protocol have been developed [28] which help scale the therapy to more individuals, including to those who may not have access to a therapist.

The variant of BA embedded in The Guardians focuses solely on encouraging players to choose, perform, and reflect on adaptive real-world activities (Fig. 3). Players are presented with a curated list of activities from categories of “Basics”, “Fitness”, “Fun”, “Social”, “Art” or “Other”, where specific activities were informed by BA treatment manuals [3], [29] and chosen for their ability to create feelings of productivity, achievement, creativity, or fun. Each activity lasts between 3-60 minutes, and once this time has elapsed, the player receives a notification to return to the game. On returning, they are prompted to briefly reflect on how they feel after performing the action, and then they receive their rewards which can be used immediately in the game. Players are only rewarded once per day for performing one real-world task3, and as rewards augment a player’s ability to vary their gameplay and make progress towards the game’s objectives, players are incentivised to complete tasks consistently and over an extended period of time. Performing these adaptive and pleasant tasks on such a schedule is conducive to converting the practice of self-care behaviour into a habit, a construct that is associated with positive long-term health outcomes [30].

The decision to incorporate a lightweight BA protocol reflects a core design principle to keep the The Guardians as gameful as possible. In The Guardians’ BA protocol, players are asked to complete real-world tasks and reflect on how they make them feel, where the reflection step is considered critical for reinforcing the benefits of the task [31]. However, players are not presented with BA-specific historical trends such as

3Completing more than one real-world task per day is not permitted as it was felt this would lead to rapid completion of the game which would be counterproductive to the goal of encouraging long-term engagement in self-care behaviours. Additionally, users can still play the game on days where they do not wish to complete a real-world task, though these days yield less progress towards the game’s objectives.
their past moods and real-world tasks completed. This feature was excluded due to (i) concerns about data-induced guilt – where a user feels shame or regret about their actions (or lack of actions) relative to the trends the system displays and, thus, may be discouraged from using it [32], and (ii) as part of the appeal of games results from their ability to offer an escape from reality and to start afresh, it was felt that including a feature that contains a large amount of real-world data would run contrary to the escapist aesthetic we wanted to create (as, e.g., it may remind users of how depressed they have been feeling). Nonetheless, it represents the most significant deviation of the game from the traditional BA protocol and future work will assess the impact of its exclusion.

Finally, it is worth noting that other psychotherapy protocols could have been chosen for this project. However, behavioural activation was favoured for two reasons: (i) it is a simple yet effective intervention for depression [4], and (ii) it is more aligned with the spirit of the game. Namely, the characters in this game go on adventures and completing BA tasks can be interpreted as going on adventures.

B. Overall Gameplay

In The Guardians, players are tasked with completing five objectives per realm: to collect all the pets and medallion pieces, to unlock all activities, to complete a realm-specific objective, and to defeat the Scorian. To do so, they must collect pets and items via completing daily BA tasks, referred to as daily adventures. The player then sends these pets on missions in order to increase their skills, where each mission has specific skill requirements for the pet team that can complete it. The player is only shown a small subset of available missions at a time, and each mission requires stamina, which regenerates in real-time. Therefore, the player must carefully choose which pets to use in which missions in order to most efficiently complete the objectives of the realm.

Pet missions are always completed successfully after a short period of time, and when the pets return, they are rewarded with experience in a particular skill. Additionally, the player is rewarded with various currencies, cosmetic items, or tools to aid their progress through the game (cf. Fig. 4). As pets level up, more missions with higher skill requirements are unlocked. By levelling up enough pets, completing enough missions, and completing other realm-specific tasks, the player will eventually be able to send their most powerful pets to free the Guardian of the realm and defeat the Scorian invader.

To foster long-term interest, The Guardians is divided into specific realms, each of which unlocks after 21 days, regardless of player progress. This was intended to bring back lapsed players. Each realm contains unique gameplay mechanics. First, players complete Twilight Forest, a plain introductory realm. The next realm is Duskfall Manor, which introduces candy that the pets must collect in some missions and then use to partake in others. Finally, the last realm – Festival of the Sun – introduces the flare mechanic, where each pet flares and receives double rewards every five missions and, thus, must be managed to maximise flare bonuses.

C. Contextualising Rewards in the Game Mechanics

The rewards mechanism in The Guardians is informed by Gacha games, and gives players random pets (and other virtual currency) as a reward for completing real-world tasks. The pets can be sent to improve their skills as described, as well as customised via costumes and nicknames. This way, players are drawn back each day by several factors: the curiosity of what pets and abilities they will receive next; the desire to continue improving and interacting with pets they have invested in (via the sunk cost fallacy); and, the desire to continue their progress towards completing the game and making their pets the heroes.

Fig. 4 shows the main game loops in The Guardians and how they contextualise the value of a pet reward. The blue shading represents the primary loop, where pets are repeatedly sent on missions to gain XP. The green shading represents the end-state of each realm in the game, and the grey shading represents the secondary and tertiary loop components, which give depth and variety to the gaming experience. The BA rewards mechanism is shaded in orange. It is worth noting that the orange shading alone would represent the scope of a purely cosmetic implementation of gamification, with no further game features to contextualise the value of the pet rewards. By contrast, in The Guardians, it is through the various intertwined game loops that rewards gain their value.
A. Outcome Metric Definitions and Data Collected

We perform analyses that pertain to both the concepts of engagement and effectiveness. The Guardians was designed to explicitly target engagement, without dedicated design to improve effectiveness beyond what might be expected from other behavioural activation protocols. However, we still report effectiveness results, as these may be useful reference points to readers. This paper’s analysis of engagement is strictly behavioural. We processed anonymous user-level game statistics to derive metrics such as play retention, protocol retention, and feature popularity. Regarding effectiveness, The Guardians collects an explicit rating of well-being improvement when a player completes a real-world task. The question asked is “How do you feel after your adventure?” and players respond on a 5-point scale: “Worse”, “Not As Good”, “The Same”, “A Little Better”, “Much Better”. While this measure does not provide a complete assessment of the effectiveness of the embedded BA protocol on user well-being, its value suggests the relative efficacy of the tasks.

A summary of the data collected by The Guardians and used in the analysis is presented in Tab. I. The Guardians was publicly released on 26th April 2020 and marketing was only performed through Twitter and media articles.

B. Overall Game and Protocol Engagement

Day-N user retention3 is displayed in Fig. 5. We define Day-N retention as the proportion of users that interact with the game or complete a protocol task on the Nth day since they installed the game, where Day-1 is the first day after installation, and the denominator is the number of users who install the game on Day-0. The 15-day and 30-day overall app retention rates (Fig. 5a) of 10.0% and 6.6%, respectively, compare favourably to the average retention rates for mental health apps reported by Baumel et al of 3.9% (IQR 10.3%) and 3.3% (IQR 6.2%) [2], with The Guardians showing an improvement of more than a factor of two over the median. Furthermore, the 1-day and 28-day retention of 37.9% and 7.3%, respectively, suggest The Guardians is in line with rates observed from the top 15% of mobile games [33] (Fig. 5b).

Retention with the embedded BA protocol is also shown in Fig. 5c, where a player is counted as retained if they return to rate a behavioural activation task on day N (i.e., they complete the flow in Fig. 3). The data sources for (a) and (b) can be found in [2] and [33], respectively, and these sources drive the days chosen for comparison.
to play the game engaged in performing and reflecting on the real-world tasks it is designed to incentivise. Fig. 6 further supports this finding, where here real-world task completion is reported as a percentage of the number of daily active users. Accordingly, we report that tasks are completed on 69.0% of days played (37,574 tasks in 54,461 total days).

Another interesting trend in Fig. 5c & Fig. 6 are the bumps around 21 and 42 days when new realms unlock. This suggests that new gameplay reengages lapsed players: both with the game and the BA protocol. The 2-day retention increase (Fig. 5c) from Day-20 & Day-41 is 23.1% & 6.3%, respectively, for playing, and 41.9% & 42.6% for task completion.

C. Engagement with Specific Game Features

To investigate specific game features associated with player retention, Fig. 7 shows the proportion of players that are retained after Day-0 given their actions on Day-0. We see that completing in-game missions (i.e., the primary game loop) results in the largest difference in the proportion of players that are retained after Day-0, closely followed by some optional pet interactions – dragging and dressing up with cosmetics. Completing the real-world BA task also results in a considerable difference, however, nicknaming pets seems to be less decisive. Overall these trends suggest that it is important for players to interact with both the game features and the BA protocol on Day-0 if they are to be retained.

To assess longer term engagement trends, Fig. 8 presents how user behaviour in the first 7 days since installation associates with the overall time a user is retained (via retention buckets)\(^7\). We observe several interesting trends. First, overall game usage (Fig. 8a) and BA task completion (Fig. 8b) in the first 7 days are an indicator of longer overall retention, with 50% of the users that play 7 days or complete 6-7 tasks in the first 7 days remaining active for \(\geq 31\) days. This may suggest that encouraging consistent play from the outset is advisable for long-term engagement. However, while completing the BA task is a strong retention indicator for some users, it is noteworthy from Fig. 8b that 560 users complete no real-world tasks in the first 7 days but many keep playing over a longer horizon. As aforementioned, The Guardians can be played even if the user does not partake in the BA protocol, which may explain this group. Second, we note that BA task ratings in the first 7 days (Fig. 8c), as well as their variety

\(^7\)We standardise the observation window length for these metrics to remove any sources of bias between the buckets (e.g., progression to a new realm).

![Fig. 6. The percentage of daily active users that complete the daily BA task. Global mean represents the average task completion over all days played (i.e., 37,574 tasks in 54,461 total days).](image)

![Fig. 7. Proportion of users retained after Day-0 given their actions on Day-0. “Complete Task” refers to completing and rating the BA task; “Complete Missions” refers to sending pets on in-game missions; the other items refer to optional in-game actions. NB: retention here is inclusive of any user that is seen again after Day-0, not just the users that are seen strictly on Day-1. (Fig. 8d), do not show a clear association with long-term retention. This may suggest that the nature of the initial BA tasks is not overly significant for long-term engagement, so long as a task is chosen and practiced regularly (cf. Fig. 8b).

Finally, we observe a variety of retention trends given interactions with game features in the first 7 days (Fig. 8e-j). For completing missions ((e); i.e., the primary loop) and optional features such as talent upgrades (f) and dragging pets (g), there is a clear trend that higher usage of these features in the first 7 days associates with longer retention. As talent upgrades and dragging pets are not essential for game progress, higher usage of the former feature may suggest a subtype of player who enjoys mastering the game, and higher usage of the latter may suggest a subtype who enjoys exploring/immersing themselves in the game’s interactions regardless of making progress. However, for the remaining tertiary loop features

![Fig. 8. Proportion of users in each retention bucket given their actions during the first 7 days of being a user. A retention bucket represents how long the user remained active. Users are also sorted into buckets based on the frequency / average value of actions in the first 7 days. NB: \((x, y)\) is interval notation and the sample size of each bucket is listed in parentheses under each label.](image)
FIG. 9. Real-world task popularity and average rating by type of activity. NB: counts (a-b) are on a log-scale and sample size of each bar is in parentheses.

(h-j) – treating pets, dressing up pets, and nicknaming pets – the association between the usage level and retention is less clearcut, which may suggest these features have lower long-term value to users (i.e., they keep users less engaged across sessions). Future work will extend this analysis by identifying user subgroupings across all engagement metrics (e.g., by using clustering analysis) and testing if these i) predict long-term retention and ii) indicate user psychographic profiles.

D. Real-World Task Effectiveness

Fig. 9 reports the popularity and average rating of real-world tasks performed by users of The Guardians. Overall a broad range of activities are being performed across the main categories (Fig. 9a) and on average they are helping users to feel at least a little better (Fig. 9c). Fig. 9c suggests that fitness activities are the most effective, though we note that the difference in averages between the categories is small.

Regarding the popularity of individual activities from Fig. 9b, it is interesting that “Brush Teeth” is the most popular. It is the first activity displayed in the task menu, and it is also the quickest to yield a reward (3 minutes). Therefore, its popularity may reflect cheating of the rewards system. Furthermore, it is noteworthy that the “Other” / “Custom” activity is the second most popular in Fig. 9b. This suggests that more task types could be introduced to appeal to players, although it is unlikely to represent further cheating, as the “Other” activity takes 30 minutes to yield rewards.

Finally, Fig. 10 displays the average real-world BA task rating over time. A slight increase by days since installation is observed, suggesting that as users play the game for longer they rate their real-world tasks slightly higher. As the direction of causality is not known, this trend may indicate that either i) users who feel more benefit from the embedded BA protocol are encouraged to play the game for longer, or alternatively ii) that users who play the game for longer gradually benefit more from the BA. Investigating this trend further by assessing user subgroups is left as important future work.
player interactions with *The Guardians* in a clinical context is being designed to further our understanding of these factors. Finally, beyond these limitations, future work will consider variants of the game mechanic, narrative and graphics, and we are interested in hearing from various communities about the features that would appeal to them most.

**VI. CONCLUSION**

This work introduced *The Guardians* – a publicly released free-to-play game that is helping players to perform real-world actions that make them feel better. *The Guardians* engages users at more than twice the average rate of digital mental health apps, and playing the game often results in users completing the embedded behavioural activation intervention. This suggests that *The Guardians’* rewards mechanism – that is contextualised by the game’s mechanic – is incentivising users to keep playing and keep completing real-world actions over extended periods of time. We intend to run a controlled study to formally assess this effect in our future work.

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