

# The Behavioural Effectiveness of Gamified Social Marketing within Well-being Mobile Apps

Health-related challenges remain pressing global concerns, reinforcing the need to understand how social marketing interventions influence behaviour. Gamification offers a promising approach to increase engagement and facilitate behaviour change by creating intrinsically motivating, game-like experiences. To move beyond game designer-centered approaches, this research adopts a user-centered perspective to examine (RQ) how gamification in well-being mobile apps influences health behaviour, following the “affordances-psychological outcomes-behavioural outcomes” framework. A user-centered perspective defines gamification as the enhancement of a service with affordances that support gameful experiences, emphasizing that motivation emerges from users’ perceptions and interactions with these affordances. This framework enables a holistic examination of how gamification affordances (GA) trigger psychological outcomes (PO) and drive behavioural outcomes (BO), addressing calls for holistic approaches to studying user motivation. Accordingly, this study investigates (1) how GA affect PO, (2) how PO shape BO, and (3) the direct effects of GA on BO.

GA capture users’ subjective perceptions of game design elements. They fall into three categories: achievement-related affordances (ARA), which enhance users’ sense of accomplishment; social-related affordances (SRA), which foster user interaction and social networking; and immersion-related affordances (IRA), which deepen engagement through narratives and personalization. The study analyses achievement-related affordances - achievement visualization (ACV), rewardability (RWD), status (STS), competition (COM); social-related affordances - interactivity (INT), cooperation (COO); and immersion-related affordances - self-expression (SEE), narrative (NAR). Single game design elements may trigger multiple GA depending on users’ perceptions, shaping PO and BO. Drawing on self-determination theory (SDT), GA actively fulfill basic psychological needs for autonomy, competence, and relatedness. Simultaneously, grounded in the technology acceptance model (TAM), GA shape users’ psychological interaction with technology by influencing extrinsic motivators (usefulness, ease of use) and intrinsic motivators (enjoyment). Hence, PO include self-determination constructs - perceived autonomy (PANS), competence (PCNS), relatedness satisfaction (PRNS); and technology acceptance constructs - perceived usefulness (PUSE), ease of use (PEOU), enjoyment (PENJ). Together, these outcomes influence satisfaction (SAT), understood as the degree to which users’ expectations are met, and consequently drive BO, including continued use intention (CUI) and health behaviour (HBV). Expectation-confirmation theory frames how fulfillment of expectations strengthens commitment and behaviour change.

Data were collected through a cross-sectional survey on Qualtrics © administered to 184 users of one of thirty gamified well-being apps targeting eating habits and physical activity behaviours. Recruitment occurred via online channels (social media and user communities) and in-person outreach (sports events, gyms, and sports goods stores). Screening questions confirmed eligibility by verifying active use of a gamified well-being mobile app. Participants reported their perceptions of GA, PO, and BO using validated multi-item Likert scales. Additional variables captured usage-related information, including the specific app used, usage purpose, tenure, frequency of use over the past four months, and average weekly time spent on overall health condition (OHC) or physical activity (PA). Demographic variables included age, gender, education level, main occupation, family structure, and work–life flexibility. Forced-response settings were applied to all items, resulting in a dataset with no missing values. Data analysis in STATA © included descriptive statistics, calculation of construct scores for reflective variables and composites for formative variables, correlation analyses to identify preliminary associations, and regression models to assess predictive relationships.

Regarding sample characteristics, most participants used Strava (72.28%) and relied on apps to support PA (90.22%). The sample consisted mainly of experienced and frequently engaged users (74.46% with ≥1 year of use; 65.22% using apps several times per week), typically engaging in OHC or PA for 1-9 hours per week (70.11%). Participants were predominantly male (59.78%), aged 25-44 (49.46%), employed (74.46%), university educated (88.59%), and reported moderate to high work-life flexibility (73.91%).

Results show that frequency of interaction with GA and their perceived importance exert weaker effects on PO and BO, indicating that gamification's effects hinge on users' perception of GA rather than on interaction intensity. ACV significantly enhanced nearly all PO and BO except PRNS, confirming its central role. Prior research identifies ACV as the most common and studied affordance. Functioning as a feedback system focused on individual progress, ACV does not significantly influence relatedness, likely because its inherently individual orientation limits opportunities for meaningful social connection, despite its potential to foster social comparison. Game designers should therefore prioritise ACV to improve outcomes while remaining attentive to its social implications.

NAR strongly predicted multiple PO and BO, including PUSE, PENJ, SAT, CUI, and HBV. Unlike artifactual affordances tied to perceptions of specific elements, NAR functions as a situational affordance that guides how other affordances shape user cognition and behaviour. Its effects on technology acceptance and BO, rather than on basic psychological needs, underscoring the still underexplored importance of NAR within gamified contexts.

COM showed no significant effects, aligning with calls to explore COO. COO positively influenced PCNS, PUSE, PENJ, and HBV. The positive effect on HBV highlights its behavioural importance, although COO did not impact PRNS, contrary to literature suggesting that collaboration satisfies relatedness needs.

INT positively predicted PRNS but negatively predicted PUSE and HBV. While INT fosters relatedness satisfaction, excessive social interaction may create social overload or technological fatigue, reducing PUSE. Game designers must therefore balance opportunities for INT with risks of overload.

RWD negatively predicted PANS, PRNS, and SAT. These results support concerns that extrinsic incentives may undermine intrinsic motivation by shifting focus away from self-driven engagement, while unmet expectations associated with rewards may reduce SAT. Game designers should thus apply rewards carefully and prioritise intrinsic motivators.

Overall, findings show that ACV and NAR are consistent drivers of PO and directly support HBV by fulfilling expectations and strengthening commitment. COO promotes HBV, whereas INT negatively predicts HBV likely due to social overload. RWD reduces SAT, suggesting that extrinsic incentives may weaken motivation. All PO positively predict SAT, which drives both CUI and HBV, with CUI further reinforcing HBV. These findings suggest that users' perceptions of GA shape psychological responses, app usage, and behavioural change.

This study acknowledges limitations associated with its cross-sectional design, reliance on self-reported data, and use of correlation and regression analyses. Future research should adopt longitudinal designs, use structural equation modelling, and integrate qualitative and objective measures. Nonetheless, the study advances theory on user-centred gamification by providing insights into how gamification in well-being mobile apps influences HBV and clarifies how GA shape psychological and behavioural pathways. It also provides practical guidance: game designers should prioritise ACV, NAR, and COO to enhance HBV, moderate INT to prevent overload, and use RWD sparingly to avoid undermining intrinsic motivation and SAT.

**Keywords:** Gamification; Affordances; Psychological Outcomes; Behavioural Outcomes.

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