



Exploring game-based psychological empowerment and its motivational and wellbeing effects

Jukka Vahlo ^a ,* , Suvi K. Holm ^b , Johanna K. Kaakinen ^b , Aki Koponen ^a

^a Centre for Collaborative Research, Department of Economics, University of Turku, Finland

^b Department of Psychology, University of Turku, Finland

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ABSTRACT

This study empirically investigates how individuals experience psychological empowerment through gaming compared to their daily life interactions. Drawing on a survey of 2,594 participants from Finland and Denmark, we examine the prevalence, predictors, and implications of psychological empowerment in gaming. Our findings show that 29 percent of respondents from the nationally representative subsamples in both countries report experiencing greater psychological empowerment in gaming than in life in general. Further analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) reveals that gameplay preferences, positive affect, and playtime predict game-based psychological empowerment. Moreover, the meaningfulness component of game-based empowerment significantly influences gaming motivation — particularly immersion, achievement, relaxation, and challenge motives — as well as subjective vitality in daily life, suggesting potential transfer effects. Adapting Spreitzer's (1995) model of psychological empowerment, this study contextualizes these findings within gaming experiences. The results contribute to a deeper understanding of psychological empowerment in games and offer insights for game design, emphasizing the value of creating meaningful and empowering play experiences.

1. Introduction

The purpose of this study is to investigate the empowerment players derive from playing video games, and how this empowerment influences their game engagement and wellbeing. At its core, the concept of empowerment involves the process of gaining control [1] and being equipped with the means to act [2,3], although its interpretation depends on the context. Empowerment operates within a complex framework that spans from individual psychological empowerment to the wider sociopolitical influences within communities, all of which can either foster or impede the process of empowerment [4,5]. The concept of empowerment has found extensive application across several disciplines, including organizational psychology, social psychology, and the nursing sciences [4–8]. This study focuses on the concept of psychological empowerment at the individual level in the context of game experience research. When interpreted in this context, the concept of psychological empowerment refers to the skills and assets that individuals have, which enable them to increase their control and autonomy [9] when gaming.

Psychological empowerment within the context of game research denotes the player's sense of agency, autonomy, and mastery in player-game interaction. It encapsulates the idea that games should not only

entertain but also provide players with opportunities to make meaningful choices, overcome challenges, and experience personal growth (see, e.g., [10–14]). In this sense psychological empowerment arguably not only heightens the enjoyment derived from playing but also fosters a deeper emotional connection with the game and its narrative. Furthermore, psychological empowerment in gaming can serve as a powerful motivational tool, spurring players to persist in the face of adversity, learn new skills, and ultimately achieve their goals within the virtual realm (cf. [10–12,15]). Based on these premises and with the core objectives of game design, game research has approached and applied empowerment as a concept and as a research subject from a variety of perspectives encompassing for instance exergaming [16,17], game development practices [18], meaningful gamification solutions [19], studies that investigate health effects of serious games [20], and player experience research in a more general sense [21]. Vornhagen et al. [22] have recently provided an extensive review on existing game research on empowerment within the framework of human–computer interaction in their empirical study on empowering and disempowering game experiences.

* Corresponding author.

E-mail address: jukka.vahlo@utu.fi (J. Vahlo).

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Despite the versatile research in the area of empowerment in game research within the human–computer interaction, there remains a notable gap in understanding how game-based psychological empowerment should be understood. Particularly little is known if players derive greater psychological empowerment from gaming experiences compared to their daily life interactions in general—and if they do, what kind of factors are related to this phenomenon. Moreover, little is known about the game experience-related elements that predict game-based psychological empowerment. Both of these issues are tied to the fact that there currently exists no consensus on how exactly psychological game-based empowerment as a research concept should be understood and how it should be assessed [15,22,23]. Furthermore, it has been recently argued that game researchers rarely conduct research on how players themselves experience empowerment. Instead of this, empowerment is often assumed by researchers to be a condition that players achieve as an outcome of successful gameful, game-based, or gamified intervention [22].

The present study adopts Spreitzer’s [8] model of psychological empowerment as a framework for understanding how players experience empowerment both in digital gaming environments and in their daily lives. Compared to other empowerment models, particularly those developed in organizational or educational contexts, Spreitzer’s model offers a multidimensional and experientially rich perspective. It conceptualizes empowerment through four interrelated dimensions: meaning, competence, self-determination, and impact. These dimensions closely align with fundamental aspects of game design and player engagement, supporting the model’s applicability in game research.

While the Self-Determination Theory (SDT) has been widely applied in game research to examine the motivational underpinnings of player behavior and well-being, our study employs Spreitzer’s [8] model of psychological empowerment due to its particular suitability for comparing experiences across different life domains. Although the two frameworks share conceptual similarities, they differ significantly in emphasis and theoretical scope. The SDT is a grand theory of human motivation, aiming to explain universal psychological needs and their role in sustained intrinsic and extrinsic motivation [10,24–26]. As such, most studies applying the SDT tend to make arguments about general human motivation and traits that are relatively stable and individual-centered. In contrast, Spreitzer’s model is a domain-general yet context-sensitive framework that focuses on individuals’ cognitive appraisals of empowerment within specific settings. It emphasizes the characteristics of experiences — how meaningful, autonomous, competent, and impactful a particular interaction feels — rather than underlying motivational traits and the satisfaction of basic psychological needs. This experiential, situational focus makes it particularly well-aligned with our objective of comparing how individuals experience empowerment in gaming versus daily life. The model’s four dimensions provide a structured and flexible lens through which empowerment can be consistently evaluated across different domains.

By applying Spreitzer’s [8] model, our study investigates whether players experience higher levels of psychological empowerment in gaming than in their everyday interactions, and if so, identifies the factors contributing to this phenomenon. Understanding these factors not only deepens our comprehension of the psychological mechanisms underlying gaming experiences but also holds significant implications for game design. By elucidating whether and how gaming can serve as a potent source of psychological empowerment for certain individuals, we can inform the development of technology-driven interventions that harness the transformative potential of gaming.

2. Theoretical background

2.1. Spreitzer’s model of psychological empowerment

Psychological empowerment is defined as a subjective cognitive and affective process that enables and motivates individuals to feel

effective, competent, and autonomous to perform tasks [27,28]. Psychological empowerment is characterized by an inherent drive for tasks, evident in a cluster of four cognitions that mirror an individual’s approach to their task or role in a sociocultural context: meaning, competence or self-efficacy, self-determination, and impact [29,30]. In this motivation-centered model of psychological empowerment, meaning refers to the value of a goal in relation to an individual’s ideals, involving a fit between task requirements and one’s beliefs, values, and behaviors. Competence is an individual’s belief in their capability to perform activities with skill, specific to that task or a role. Self-determination is an individual’s sense of having choices in initiating and regulating actions, reflecting autonomy and freedom. Finally, impact refers to the degree to which an individual can influence outcomes of the task or activity. These four aspects of meaning, competence, self-determination, and impact are considered to contribute additively to psychological empowerment [8].

An influential theory of psychological empowerment was developed by Spreitzer [8] who not only adapted the four additive aspects of meaning, competence, self-determination, and impact proposed by Thomas and Velthouse [29] as constituents of psychological empowerment, but also outlined a nomological network for psychological empowerment encompassing its precedents and key outcomes. Spreitzer [8] identified four precedents of psychological empowerment: locus of control, self-esteem, access to information, and rewards. The key outcomes of psychological empowerment in the Spreitzer’s model [8] — which was originally developed within organizational psychology — were managerial effectiveness and innovation. In addition, Spreitzer recognized that empowerment was also important for wellbeing and health of the individual. In studies of work life, psychological empowerment has been associated with a higher level of job satisfaction, which, in turn, is widely considered to be an important indicator of well-being and health [27,31,32].

Later influential meta-analyses and empirical studies have suggested several additional antecedents and consequences for psychological empowerment. These have included associating empowerment with affective reactions, attitudes, and performance variables such as tendencies and the willingness to act in a specific way [33,34]. These consequences refer to how psychological empowerment is positively associated with situations “in which people are motivated and have a sense of purpose” [27].

Spreitzer’s [8] model of psychological empowerment, while originally developed within the context of organizational psychology, has been effectively applied across various domains beyond traditional workplace settings. The model has been utilized extensively in healthcare environments, particularly among nursing professionals, to assess factors such as job satisfaction, engagement, and the prevention of emotional exhaustion [27,35]. It has furthermore applied in analyzing, for instance, online knowledge share [36], customer engagement [37], and innovative behavior at large [38] across different contexts. These applications underscore the model’s versatility in evaluating individuals’ perceptions of empowerment in diverse situations and settings.

The model’s adaptability to other contexts beyond workplace experiences stems from its focus on four core dimensions — meaning, competence, self-determination, and impact — which are pertinent to a wide range of activities and experiences including game experiences. This context-sensitive approach allows for the assessment of empowerment as it is experienced in specific situations, making it suitable for comparing empowerment across different life domains, such as gaming and daily life. In contrast, theories like the Self-Determination Theory offer a broader, more trait-oriented perspective on human motivation, emphasizing universal psychological needs. While the SDT provides valuable insights into general motivational processes, Spreitzer’s model offers a nuanced framework for examining how empowerment is cognitively appraised in particular contexts.

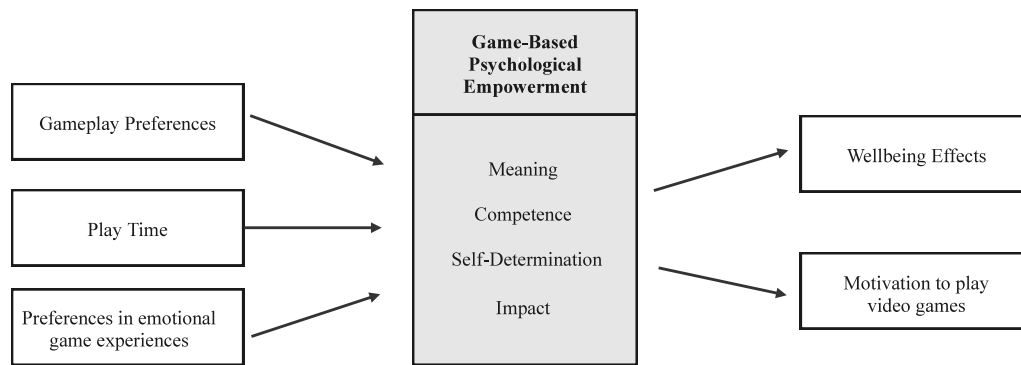


Fig. 1. Initial model for investigating game-based psychological empowerment. The model is based on Spreitzer's [8] theoretical considerations on partial nomological network of psychological empowerment.

2.2. Game-based psychological empowerment

In the present study, we adapted Spreitzer's model [8] to conceptualize psychological empowerment in game-based settings (see Fig. 1), by building also on the meta-analyses made on psychological empowerment and Spreitzer's model [33,34]. In our approach, gameplay activity preferences, preferences in game-induced emotional experiences, and play time were regarded as antecedents for game-based psychological empowerment, as they inform us about individuals' willingness to act in a certain way [33,34]. Gameplay activity types denote the core gameplay loop and its main interaction models, i.e., game dynamics and game mechanics, that the person engages with during gameplay [39,40]. Gameplay activity types (e.g., resource management, game world exploration, shooting) are arguably a more reliable method for assessing game preferences than game genres, which are constantly evolving and known to be bound to cultural interpretation and individuals' knowledge about ever-changing gaming discourses [41–43].

Players' preferences in emotional responses in gameplay and play time were other factors that we considered to potentially influence game-based empowerment [44]. As management of affect is one of the three key elements of self-regulation [45], it is interesting that studies so far have not focused much on what kind of emotional responses players seek from the perspective of how particular emotional responses are related to psychological empowerment. While it may seem self-evident that players would seek out positive emotions, the fact that many video games have become notorious for incorporating violent and melancholic content seems to point to the direction that sometimes feelings other than happiness are sought for, and perhaps are also precedents for psychological empowerment. In fact, one could argue that games may offer a platform in which negative situations such as escaping for your life can be simulated safely [46,47] and in ways that equip the individual for future versatile situations across daily life events [48]. This may not pertain only to individual events in gameplay, as evidenced by [49,50] observation that some players may prefer to experience and work through negative emotions via engaging with aggressive gameplay activities such as shooting, evaluating initial negatively valenced emotions as rewarding afterward. Furthermore, there is initial evidence that preferences in types of gameplay activities [39,40], have been found to be positively associated with perceptions of well-being if the preferred activities are included in the game being played [44].

Motivation to play video games and well-being effects on life in general are considered as potential outcomes of game-based psychological empowerment (see Fig. 1). It has been argued [27] that empowerment and its four proposed dimensions (meaning, competence, self-determination, and impact) are important antecedents for intrinsic motivation. Thus, psychological empowerment derived from gaming may be a precursor for general motivation to play video games. A key component of games is that the players have control over the events

that are happening to them through their own actions [51,52]. Building on this, studies have suggested that adolescents' main motivation for playing would be feelings of achievement and how it affects their sense of competence and self-confidence [53]. Furthermore, some of the participants in the study of Funk et al. [53] indicated that they compensated inadequate competencies they had in their lives with competency in video game play, ensuring that they got feelings of pride from at least somewhere. In the framework of the Self-Determination Theory (SDT) it has been shown that satisfaction of the needs of autonomy, competence, and relatedness independently predict future play and wellbeing, for instance from the perspective of subjective vitality [10,54,55]. Recent qualitative studies on gaming disorder have similarly indicated that gaming can function as a coping mechanism for adverse adolescent experiences and contribute to identity formation, resulting in feelings of satisfaction related to social acceptance, autonomy, and control [56].

As for the potential effects of game-based empowerment on wellbeing, related insights can be drawn from the study by Przybylski, Weinstein, Ryan, and Rigby [57], which, although not employing the concept of psychological empowerment, highlights the importance of accounting for individuals' broader life experiences. Their research, grounded in the Self-Determination Theory, showed that players who struggled to satisfy their psychological needs in daily life tended to engage more heavily in gaming, but this engagement often took on an obsessive quality and was associated with reduced enjoyment and a more negative mood following gameplay. In contrast, players who reported higher need satisfaction in life experienced more positive emotional outcomes from gaming. Importantly, when everyday need satisfaction was controlled for, neither obsessive nor harmonious gaming patterns showed a clear association with well-being. These findings underscore the importance of considering individuals' general psychological functioning when evaluating the potential effects of game-based experiences — including empowerment — on well-being.

Empowerment is not a fixed characteristic of an individual but depends on the contextual factors [29], which underscores the importance of recognizing empowerment's variability across various scenarios. Different situations comprise distinct contextual elements, leading to differential empowerment levels. Evaluating psychological empowerment as a characteristic of a particular domain — such as in everyday life or when playing — allows for the consideration of the impact of inherently diverse contextual factors.

Previous research offers support for the idea that players may experience higher psychological empowerment in gaming contexts compared to their everyday lives. Compensation models of media use posit that individuals turn to media experiences to satisfy psychological needs that are unmet or frustrated in real life [58,59]. Similarly, within the framework of the SDT, it has been proposed that people actively seek out compensatory activities to replenish frustrated psychological needs [60,61]. Empirical findings support this view. For example, Sheldon and Gunz [62] found that low satisfaction of basic

needs was associated with greater motivation to seek out experiences that fulfill those needs. Prior studies have shown that players who feel a lack of competence, autonomy, or social connectedness in their everyday lives may compensate by seeking empowering experiences through gameplay [53,63]. Recent work by Ballou et al. [64] provides qualitative evidence that players constantly and intentionally choose gaming, particular games, and particular styles of gaming as a means to compensate for thwarted needs.

2.3. Research questions and hypotheses

This study has three research questions:

RQ1: Do players systematically experience higher levels of psychological empowerment in gaming compared to their everyday lives, and what characterizes these players?

We hypothesize that:

H1a: A statistically significant proportion of players derive higher psychological empowerment from gaming than from everyday life, consistent with compensation models of media use [58,59,64].

H1b: These players differ from those who experience similar levels of psychological empowerment in gaming and in life in general in their engagement in playing video games.

RQ2: Which factors predict game-based psychological empowerment?

We expect that:

H2a: Player preferences in both positive and negative emotional responses in gaming are associated with higher game-based psychological empowerment.

H2b: Higher preference in gameplay activities is associated with higher derived psychological empowerment.

RQ3: Is empowerment from gaming, when compared to empowerment from daily life, associated with (a) gaming motivation and to (b) everyday wellbeing?

We hypothesize that:

H3a: All dimensions of game-based empowerment are equally important precedents for gaming motivation.

H3b: Lower psychological empowerment in life predicts motivation to play videogames.

H3c: Game-based empowerment is not associated with well-being in life in general.

These questions were examined in a large-scale (N = 2594) survey study conducted in Denmark and Finland. To answer the research questions, we first examine whether there exists subgroups of players who derive more psychological empowerment from gaming than from everyday life, and describe how they differ from participants who do not gain empowerment from gaming (RQ1). We then use partial least squares equation modeling (PLS-SEM) to examine the precedents and outcomes of game-based empowerment (RQ2, RQ3).

3. Method

Participants were recruited via an online panel (n = 2000; M3 Research Ltd) and mailing lists and social media (n = 594). Online panel provided representative samples of Finnish (n = 1000) and Danish (n = 1000) populations. The final dataset consisted of responses from 2594 participants (51.7% men, 48.3% female), whose mean age was 39.3 years (SD 15.1). The sub-sample consisting of participants recruited via mailing lists and social media did not differ statistically significantly from representative sample in gender distribution (men 54.5%), but respondents were much younger than those in representative samples (mean age 28.0 years). Since this complementary data was a convenience sample based on individuals' interest in taking part in a study on game preferences, the participants were more active players and engaged in gaming culture than the general adult population.

3.1. Psychological Empowerment Scale

The Psychological Empowerment Scale by Spreitzer [8] was used for assessing both game-based empowerment and empowerment in daily life in general. The Psychological Empowerment Scale is a 12-item scale that consists of four factors: meaning, competence, self-determination, and impact. We adapted the scale into "Daily Life Psychological Empowerment Scale" and "Game-Based Psychological Empowerment Scale" by modifying the original wording of the instructions and items. In the Daily Life Psychological Empowerment Scale participants were instructed to reflect on their attitude towards their everyday life, and the wording of the items were modified to describe daily life. For example, the original item from the Self-Determination dimension "I have significant autonomy in determining how I do my job". was modified into "I have significant autonomy in determining how I live my everyday life". In the Game-Based Psychological Empowerment Scale participants were asked to reflect on their attitudes towards their gaming experiences at large, and the wording of the items were modified to fit gaming context (e.g., "I have significant autonomy in determining how I act in videogames".) Responses to both scales were given on a seven-point Likert scale where 1 = Disagree completely, 7 = Agree completely.

The validity of the modified scales was assessed by making exploratory factor analyses on both of these scales on separate survey data collected in the US (see Tables A.6 and A.7). Based on the results of these analyses, we only included dimensions of Meaning, Competence, and Self-Determination in the current study. Since Spreitzer [8] argued that the factors of the scale should be considered additive from the perspective of psychological empowerment, we considered the decision of focusing only on the dimensions of Meaning, Competence, and Self-Determination to be both plausible and acceptable.

In the data utilized in the analyses of the current study, the scales had following reliability values. Game-Based Psychological Empowerment Scale: Meaning $\alpha = 0.94$ (CI 0.94 to 0.95), Competence $\alpha = 0.94$ (CI 0.94 to 0.95), Self-Determination $\alpha = 0.95$ (CI 0.94 to 0.95). Daily Life Psychological Empowerment Scale: Meaning $\alpha = 0.88$ (CI 0.87 to 0.89), Competence $\alpha = 0.87$ (CI 0.86 to 0.89), Self-Determination $\alpha = 0.91$ (CI 0.90 to 0.91). We calculated sum scores for each factor of the both scales for data description purposes.

3.2. Gameplay Activity Inventory (GAIN)

The Gameplay Activity Inventory (GAIN) is a cross-culturally validated five-factor inventory [39,40]. The five factors of this inventory assess players' preferences in activity types of aggression (e.g. shooting, killing, exploding, and battling), exploration (e.g. game world exploration, character development, story investigation), caretaking (e.g. decorating, dressing up, taking care of pets), management (e.g. resource management, trading, building and construction), and coordinate (e.g. jumping on platforms, racing, steering vehicles). Participants responded to items inquiring about their general preferences in gameplay activities (e.g. "Developing your own character and its skills and abilities") on a Likert scale ranging from 1 = Very unpleasant to 7 = Very pleasant. We used a 28-item version of the GAIN [39]. The Management dimension included 9 items $\alpha = 0.93$ (CI 0.93 to 0.94), Aggression 7 items, $\alpha = 0.95$ (CI 0.95 to 0.96), Exploration 5 items $\alpha = 0.91$ (CI 0.91 to 0.92), Caretaking 3 items $\alpha = 0.79$ (CI 0.78 to 0.80), and Coordinate 4 items $\alpha = 0.79$ (CI 0.78 to 0.80). Sum scores were calculated for each of the five GAIN dimensions. The reliabilities for the GAIN factors were further studied as a part of the PLS-SEM procedure (see Table A.8).

Table 1

Variance Inflation Factor (VIF) and tolerance values for gaming motive indicators. Multicollinearity diagnostics for eight gaming motive items.

Motive	VIF	Tolerance	Item description
Relaxation/Mood Management	1.33	0.75	I play to relax
Immersion	1.82	0.55	I play because I want to get immersed in games
Social Interaction	1.56	0.64	I play to connect with others online
Boredom	1.13	0.88	I play to kill time
Competition	1.67	0.60	I play because of competition
Achievement	2.07	0.48	I play to experience achievement and success
Escapism	1.38	0.72	I play to avoid anxiety
Challenge	1.95	0.51	I play to face challenges and to develop my skills
Mean VIF	1.61		

3.3. Positive and Negative Affect Schedule (PANAS)

Preferences in emotional responses in gameplay were assessed by applying The Positive and Negative Affect Schedule (PANAS), which is a 20-item scale for measuring feelings of positive and negative valence when self-evaluating an experience or a set of experiences [65]. We modified the scale by adding eight new items. These additions (“sadness”, “amusement”, “awe”, “relief”, “happiness”, “curiosity”, “surprise”, and “satisfaction”) were based on an interest in gaining more nuanced insight about emotions and feelings associated with game experiences. We asked the participants to consider their preferences in experiencing these feelings and emotions in game experiences on a five-point scale (1 = Very undesirable, 5 = Very desirable). Similarly to the GAIN, also the reliability for the Positive Affect scale investigated via the PLS-SEM procedure (see Table A.8). The reliabilities of the modified PANAS factors were $\alpha = 0.96$ (CI 0.96 to 0.97), and for Negative Affect $\alpha = 0.95$ (CI 0.95 to 0.95). Sum scores for both Positive Affect and Negative Affect were then calculated for describing the data.

3.4. Subjective Vitality Scale

We assessed potential wellbeing effects of game-based psychological empowerment by the Bostic et al. version [66] of the Subjective Vitality Scale [67]. We decided to apply the Subjective Vitality Scale for investigating the potential wellbeing effects of game-based empowerment, because vitality refers to the general aliveness of an individual. Previous research has linked feelings of aliveness and vitality to higher potential for thriving [68] and to lower likelihood of experiencing anxiety and depression [69]. The Subjective Vitality scale consists of six items that measure the amount of energy a person has and the feelings of “being alive” in daily life. Responses to the inventory are given on a 7-point Likert scale, with the two end points given in written instructions: 1 = “Not at all” and 7 = “Very true”. The scale reliability was $\alpha = 0.92$ (CI 0.91 to 0.92), (see Table A.8). A sum score across all items was calculated.

3.5. Motives to play video games

To study general motives for playing video games, we used a list of items, each representing a well-established gaming motive (see, e.g., [70–74]). The list included eight items covering competition, social interaction, achievement, immersion, relaxation/mood management, escapism, competence, and boredom motives, rendering the instrument a composite rather than a reflection of a single underlying trait. This approach is theoretically justified, as players’ motivational profiles are typically formed by unique combinations of distinct motives, as demonstrated by multiple factor-analytic validation and motive profiling studies (see, e.g., [70–76]).

Participants were asked to reflect on their reasons for playing video games and to rate the importance of each motive on a five-point scale (1 = Not at all important, 5 = Very important). Since the single-item measures were designed to capture distinct motivational dimensions,

we did not compute a general sum score across the motive variables. Instead, we investigated whether the items could be modeled as formative constructs. To examine this, we assessed multicollinearity among the eight motive indicators by calculating Variance Inflation Factors (VIFs). Table 1 reports the inventory items along with their corresponding VIF and tolerance values.

In multicollinearity testing, VIF values above 5 typically indicate problematic multicollinearity that can distort estimates in formative models. In contrast, VIF values below 5 — and ideally below 3.3 — suggest low multicollinearity and support the treatment of items as formative indicators [77]. As shown in Table 1, the motive indicators demonstrated low multicollinearity, indicating that the items were neither highly redundant nor strongly correlated. This provided empirical support for treating the eight motive items as representations of distinct conceptual dimensions. Accordingly, we treated the eight motive variables as formative constructs in the subsequent PLS-SEM analyses.

3.6. Measures of gaming habits

Participants responded to questions about their weekly play time, most frequently played game genres, monthly spending on gaming, platforms used for playing video games, and preferred play modes (e.g., single-player games, local cooperative games, MMOs). In this study, we report results on weekly play time and its breakdown by game type.

3.7. Procedure

The questionnaire was initially designed in English and then translated into Finnish and Danish by professional translators. All psychometric scales were back-translated to English. The order of each item in all of the scales was randomized to minimize response bias and ensure the validity of the results by reducing the potential effects of answer patterning.

Participants responded to the survey on a web-based survey platform. After initial demographic questions, the participants first answered to the Daily Life Psychological Empowerment Scale and to the Subjective Vitality scale. After these scales, the participants responded to the GAIN, PANAS, Motives to Play Videogames, and questions regarding their gaming habits. The Game-Based Psychological Empowerment Scale was included as the very last scale of the survey. Answering the whole survey took approximately 28 min.

4. Results

4.1. Do players experience higher psychological empowerment in games than in life?

To study whether some video game players reported to derive more psychological empowerment from game experiences than from daily life in general (RQ1), we calculated the differences between the three sum score pairs of Meaning, Competence, and Self-Determination

Table 2

Comparisons between the eight classes. Reporting Bonferroni corrected pairwise t-tests between variables of each group and the corresponding means of the other seven classes combined. ME = Meaning, CO = Competence, S-D = Self-Determination.

	↓ None	↑ ME	↑ CO	↑ S-D	↑ ME+CO	↑ ME+S-D	↑ CO+ S-D	↑ All
N	1419	99	67	123	43	54	66	129
% of the sample	71.0%	5.0%	3.4%	6.2%	2.2%	2.7%	3.3%	6.5%
Age	45.5 ↑***	33.5 ↓***	37.3	40.3	29.5 ↓***	35.9 ↓*	39.2 ↓***	32.3 ↓***
Male gender	47% ↓***	0.5	0.5	66% ↑**	0.7	0.6	0.6	60% ↑***
<i>Empowerment when gaming:</i>								
Meaning	3.2 ↓***	5.3 ↑***	4.1	4.0	5.1 ↑***	5.3 ↑***	3.9	5.6 ↑***
Competence	3.9 ↓***	5.1 ↑***	5.5 ↑***	5.1 ↑***	5.5 ↑***	5.1 ↑**	5.4 ↑***	5.7 ↑***
Self-determination	3.9 ↓***	5.1 ↑***	4.9 ↑*	5.7 ↑***	5.1 ↑*	5.8 ↑***	5.6 ↑***	5.9 ↑***
<i>Empowerment in Life:</i>								
Meaning	5.6 ↑***	4.5 ↓***	5.1	5.5	4.1 ↓***	4.0 ↓***	5.1	4.1 ↓***
Competence	6.0 ↑***	5.8	4.8 ↓***	5.8	4.7 ↓***	5.5	4.4 ↓***	4.4 ↓***
Self-determination	5.9 ↑***	5.9	5.5	4.9 ↓***	5.6	4.9 ↓***	4.1 ↓***	4.4 ↓***
<i>Breakdown of playtime:</i>								
... Mobile games	47.8 ↑***	29.9 ↓**	42.0	43.0	25.5	29.0	29.7	24.6 ↓***
... Multiplayer games	12.5 ↓***	32.0 ↑***	15.4	23.5	40.7 ↑**	33.8 ↑***	20.6	39.0 ↑***
... PC/Console games	39.7	38.2	42.6	33.5	33.8	37.2	39.7	36.3
Weekly play hours	5.8 ↓***	12.4	9.2	11.9	26.8 ↑**	13.2	12.4	20.8 ↑***
Average weekly play 0 h (n):	306	5	4	4	1	2	4	3
<i>GAIN factor mean scores:</i>								
Aggression	2.6 ↓***	4.1 ↑***	3.1	3.6↑**	4.4 ↑***	4.1 ↑***	3.4	4.6 ↑***
Exploration	3.6 ↓***	4.8 ↑***	4.5	4.5 ↑**	5.3 ↑***	5.0 ↑***	4.2	5.3 ↑***
Coordinate	3.5 ↓***	4.0	4.0	4.0	4.1	4.1	3.8	4.2 ↑***
Caretaking	3.2 ↓***	3.8 ↑*	3.6	3.7	4.0	4.1 ↑**	3.3	3.9 ↑***
Management	3.4 ↓***	4.5 ↑***	4.0	4.2 ↑**	4.7 ↑***	4.5 ↑***	3.9	4.7 ↑***
<i>PANAS factor mean scores:</i>								
Positive Affect	4.3 ↓***	5.1 ↑***	5.1 ↑**	5.1 ↑***	5.2 ↑**	5.3 ↑***	4.9	5.4 ↑***
Negative Affect	2.4 ↓***	2.7	2.7	2.7	3.4 ↑**	3.0	2.8	3.4 ↑***
<i>Subjective vitality in life</i>	4.6 ↑***	4.2	4.0	4.4	3.7 ↓**	4.0	4.0 ↓***	3.8 ↓***
<i>Motives to play games:</i>								
Relaxation/Mood Management	2.8 ↓***	3.7 ↑***	3.5	3.5 ↑**	3.6	3.8 ↑**	3.3	3.7 ↑***
Immersion	2.0 ↓***	3.3 ↑***	2.6	2.9 ↑***	3.5 ↑***	3.3 ↑***	3.1 ↑**	3.6 ↑***
Social Interaction	1.6 ↓***	2.7 ↑***	2.0	2.3	3.1 ↑***	2.7 ↑*	2.2	2.8 ↑***
Boredom	2.5 ↓***	3.3 ↑***	2.7	3.1 ↑*	3.4 ↑**	3.3 ↑*	3.0	3.2 ↑***
Competition	1.8 ↓***	2.9 ↑***	2.2	2.6 ↑**	3.0 ↑**	2.7 ↑*	2.4	2.8 ↑***
Achievement	1.9 ↓***	3.0 ↑***	2.5	2.7 ↑**	3.1 ↑**	3.1 ↑***	2.5	3.2 ↑***
Escapism	1.4 ↓***	2.3 ↑**	2.0	2.0	2.6 ↑***	2.4 ↑*	2.0	2.6 ↑***
Challenge	1.9 ↓***	2.9 ↑***	2.6	2.7 ↑**	3.3 ↑***	3.1 ↑***	2.6	3.3 ↑***

$p < 0.001, p < 0.0002, p < 0.00002.$

↓ refers to significantly lower value and

↑ refers to significantly higher value in comparison to the mean of other seven classes (Pearson's χ^2).

as assessed in the survey by modified Psychological Empowerment Scale [8]. For these calculations, we used subsets of data consisting of representative samples collected in Finland (N = 1000) and Denmark (N = 1000). We only counted as examples of “higher game-based psychological empowerment than empowerment in life in general” those cases that had higher sum scores for game-based psychological empowerment than for general life psychological empowerment with respect to any three dimensions of empowerment.

The calculation process resulted in eight possible groups: a group which had higher game-based psychological empowerment in none of the three factors, three groups which had higher game-based psychological empowerment in exactly one of the three factors (Meaning, Competence, or Self-Determination), three groups that had higher game-based psychological empowerment in two of the three factors, and one group which demonstrated higher game-based psychological empowerment across all three factors. Table 2 reports the results of a series of pairwise t-tests by which we compared the mean of each group with the combined mean of the other seven groups. Since these t-tests were based on comparing the mean values of the three empowerment in life factor scores and the three empowerment in gaming across eight groups, we calculated Bonferroni correction for 48 multiple comparison. Based on these calculations, we applied the following thresholds for identifying statistically significant differences in these comparisons: * $p < 0.001$, ** $p < 0.0002$, *** $p < 0.00002$.

By far the largest group was the one which did not show higher psychological empowerment in any of the game empowerment factors over the corresponding life in general counterparts (N = 1419, 71.0%). The

second largest group was the one which demonstrated higher game-based psychological empowerment across all three factors (N = 129, 6.5%), followed by the groups that had higher value for game-based Self-Determination (N = 123, 6.2%), and for game-based Meaning (N = 99, 5.0%). The other five groups had participants ranging from 43 to 67 cases, corresponding from 2.2% to 3.4% of the representative sub-samples (N = 2000).

The group which did not demonstrate game-based psychological empowerment had significantly higher mean age (45.5) than the mean of the other seven groups. Regarding genders, this group had clearly fewer male participants than any of the other groups. Their percentage-wise breakdown of playtime was significantly more strongly leaning on mobile gaming and less on multiplayer gaming than that of the mean of other seven classes, and their weekly play time was greatly lower than that of any other group (5.8 h/week). In addition, we examined the number of participants who reported an average weekly playtime of 0 h. Group 1 included 306 such participants, whereas all the other seven groups had very few. Not surprisingly, this group showed lower values for all of the eight motive types in comparison to the mean value of the other seven groups.

All groups that demonstrated higher value for game-based Meaning than Meaning in life in general had statistically significantly higher values for multiplayer games in comparison to the average mean of the other seven groups. From the perspective of gaming motives, these groups demonstrated higher values for multiple motives, especially of immersion, challenge, and achievement.

Taken together, ca. 29 percent of participants of the representative samples collected in Finland and in Denmark demonstrated deriving

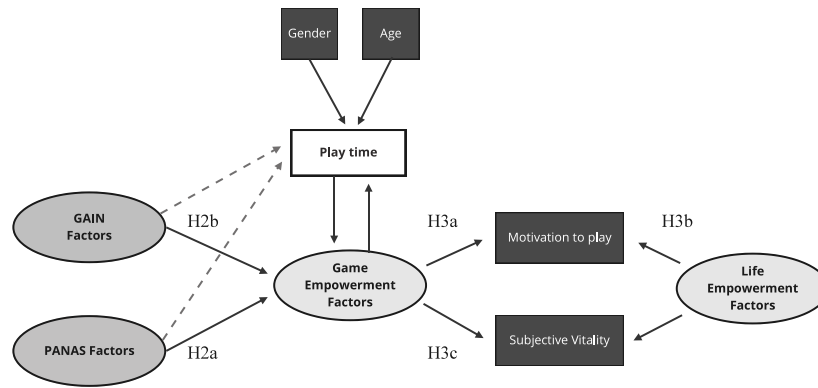


Fig. 2. PLS path model for studying the direct and indirect relationships between gameplay activity type preferences, preferences in emotional responses to gameplay, and play time on game-based psychological empowerment (RQ2), and to motives to play and subjective vitality, controlled by empowerment in life in general (RQ3).

at least one type of psychological empowerment more from gaming than from daily life in general, providing support for H1a: “A statistically significant proportion of players derive more psychological empowerment from gaming than from life in general”. Furthermore the largest segment of survey participants (71.0%) who did not report deriving higher empowerment from game experiences than from daily life in general reported both significantly lower motivation to play video games and lower weekly play time than all of the other seven groups, providing support for H1b.

These results highlight the importance of understanding what kind of elements in player preferences and game elements are associated with game-based psychological empowerment. It is also important to scrutinize to what extent game-based psychological empowerment can be considered only a short-term effect without significant consequences in general wellbeing or game engagement as large. We will next study these questions.

4.2. Do player preferences predict game-based empowerment?

To investigate the second and the third research question of this study, we designed a partial least squares path model (PLS-SEM). The main purpose of this phase of our study was to explain the variance in the game-based psychological empowerment, that is, in the factors Meaning, Competence, Self-Determination of the Game-Based Psychological Empowerment Scale. PLS-SEM was deemed a fitting type of statistical analysis for exploring RQ2 as the objective of PLS-SEM is to explain as much of the variance of the dependent variables or dependent constructs as possible. PLS-SEM differs in this from covariance-based structural equation modeling (CB-SEM) which is a confirmatory technique. The purpose of PLS-SEM is not only in explaining variance of the outcome variables and constructs but also in predicting and explaining associations between independent and dependent latent and observed variables in complex models [78,79].

Based on the initial model of game-based empowerment (Fig. 1), we assigned the five GAIN factors and the two modified PANAS factors as antecedents (endogenous composites) of the three game-based psychological empowerment dimensions. Given the plausibility that gameplay preferences and emotional experiences are influenced by game engagement, we included weekly playtime as a mediator between the GAIN and PANAS factors and the empowerment dimensions. To control for potential effects on and by playtime, male gender and age were added as control variables in its formative model. In addition to examining the mediating role of playtime, we also assessed direct effects from the GAIN and PANAS factors to empowerment.

Motives to play video games that were modeled as formative constructs and subjective vitality modeled as a reflective construct were

assigned as outcome variables of game-based psychological empowerment. To control for broader psychological influences, we included life-in-general psychological empowerment factors as reflective endogenous composites. All statistical analyses were conducted in Stata/SE 17.0 using the plssem package by Venturini and Mehmetoglu [79]. The structural model and its relation to the study’s hypotheses are illustrated in Fig. 2, while measurement model details and reliability values for each reflective composite are provided in Table A.8.

Before calculating the PLS-SEM model, we studied squared inter-factor correlations vs. average variance extracted for the measurement model to investigate its discriminant validity. The measurement model passed the test as all of the reflective models exceeded the threshold of 0.50 average variance extracted, and no interfactor correlations were higher than the AVE value of the construct under analysis. These test results are reported in Table 3.

Next, we studied the structural associations between the antecedents, factors of game empowerment, and the outcomes of play motives and subjective vitality, both controlled by daily life empowerment. Table 4 reports the direct effects of the PLS model (Fig. 2). The model had the following fit to the data: average R-squared 0.46 and relative goodness-of-fit: 0.96.

From Table 4, we observe that Exploration, Positive Affect, and age were positive predictors of weekly playtime. In contrast, the preference for Caretaking was negatively related to playtime. Among the game-based empowerment factors, both Meaning and Competence were found to be positive predictors of playtime. Together, these constructs explained 21% of the variance in weekly playtime.

Aggression, Positive Affect, Exploration, and weekly play time were all identified as similarly effective antecedents for deriving empowering Meaning from game experiences. Also preference in Caretaking was associated with higher game-based Meaning but preferences in Coordinate and Management predicted a lower value in this empowerment factor. Together these constructs explained 43% of the variance of the Meaning factor of game-based psychological empowerment.

Positive Affect was clearly the strongest predictor of higher value in the Competence factor. Aggression, Exploration, and play time were also associated positively with this dimension of game-based psychological empowerment. Preference in Caretaking and Negative affect predicted the factor negatively, and together the constructs of the PLS model explained 46% of the variance of Competence of game-based empowerment.

Positive Affect was the main antecedent of experienced game-based psychological empowerment in Self-Determination, followed by playtime. The gameplay activity type factors were somewhat more weakly associated with this empowerment factor than with Meaning and Competence. Nevertheless, Aggression, Exploration, and Management each significantly predicted higher levels of Self-Determination, whereas

Table 3

Discriminant validity test for the reflective constructs for studying meaningful game-based empowerment, its antecedents, and outcomes. Reporting squared correlations between factors and the average variance extracted (AVE) value for each construct.

	AGGR	MANA	EXPL	COOR	CARE	POS-AF	NEG-AF	GAME: ME	GAME: CO	GAME: S-D	LIFE: ME	LIFE: CO	LIFE: S-D	VITA
AGGR	1.00	0.56	0.48	0.33	0.24	0.24	0.39	0.26	0.20	0.18	0.04	0.02	0.01	0.00
MANA	0.56	1.00	0.68	0.41	0.46	0.40	0.24	0.25	0.24	0.25	0.01	0.00	0.00	0.00
EXPL	0.48	0.68	1.00	0.35	0.50	0.50	0.18	0.32	0.30	0.29	0.01	0.00	0.00	0.00
COOR	0.33	0.41	0.35	1.00	0.29	0.27	0.15	0.11	0.13	0.13	0.00	0.00	0.00	0.01
CARE	0.24	0.46	0.50	0.29	1.00	0.26	0.17	0.17	0.09	0.11	0.00	0.01	0.00	0.00
POS-AF	0.24	0.40	0.50	0.27	0.26	1.00	0.10	0.29	0.37	0.36	0.00	0.01	0.01	0.00
NEG-AF	0.39	0.24	0.18	0.15	0.17	0.10	1.00	0.10	0.04	0.04	0.03	0.03	0.03	0.00
GAME: ME	0.26	0.25	0.32	0.11	0.17	0.29	0.10	1.00	0.49	0.47	0.00	0.00	0.00	0.01
GAME: CO	0.20	0.24	0.30	0.13	0.09	0.37	0.04	0.49	1.00	0.76	0.00	0.03	0.02	0.01
GAME: S-D	0.18	0.25	0.29	0.13	0.11	0.36	0.04	0.47	0.76	1.00	0.00	0.01	0.02	0.01
LIFE: ME	0.04	0.01	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	1.00	0.37	0.25	0.34
LIFE: CO	0.02	0.00	0.00	0.00	0.01	0.01	0.03	0.00	0.03	0.01	0.37	1.00	0.55	0.29
LIFE: S-D	0.01	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.02	0.02	0.25	0.55	1.00	0.18
VITA	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.34	0.29	0.18	1.00
AVE	0.75	0.69	0.74	0.58	0.69	0.64	0.66	0.90	0.90	0.90	0.81	0.80	0.82	0.72

AGGR = Aggression, MANA = Management, COOR = Coordinate, CARE = Caretaking, POS-AF = Positive Affect, NEG-AF = Negative Affect, MOTI = Motivation to play, GA:ME = Game:Meaning, GA:CO = Game:Competence, GA:S-D = Game:Self-Determination, LI:ME = Life:Meaning, LI:CO = Life:Competence, LI:S-D = Life:Self-Determination.

Table 4

Structural PLS-Model reporting the direct standardized coefficients between antecedents of game-based psychological empowerment and their outcomes.

Variable	Playtime	Game:ME	Game:CO	Game:S-D	Vitality	Motives to play video games								
						Rela	Imme	Soci	Bore	Comp	Achi	Esca	Chal	
Aggression	0.06	0.26***	0.16***	0.13***										
Management	-0.06	-0.07*	0.06	0.10**										
Exploration	0.19***	0.20***	0.19***	0.14***										
Coordinate	-0.03	-0.10***	-0.02	0.01										
Caretaking	-0.18***	0.10***	-0.11***	-0.06**										
Positive Affect	0.11***	0.26***	0.40***	0.38***										
Negative Affect	0.01	0.01	-0.09***	-0.10***										
Playtime		0.20***	0.20***	0.19***										
Male gender	0.01													
Age	0.08***													
Meaning: Game	0.16***				0.08***	0.20***	0.42***	0.31***	0.11***	0.25***	0.36***	0.28***	0.32***	
Competence: Game	0.17***				0.02	0.29***	0.25***	0.08*	0.10*	0.09*	0.08*	0.04	0.19***	
Self-Deter.: Game	0.07				0.01	0.12**	0.01	0.08*	0.12**	0.09*	0.13***	0.08*	0.07	
Meaning: Life					0.40***	-0.04	-0.08**	-0.08**	-0.10***	-0.05	-0.06*	-0.05	0.01	
Competence: Life					0.29***	0.03	-0.07**	-0.02	0.02	0.05	-0.19***	-0.32***	-0.09*	
Self-Deter.: Life					0.01	0.05	0.03	-0.01	0.01	-0.06*	0.02	0.09**	0.01	
R-Squared	0.21	0.43	0.46	0.44	0.39	0.31	0.39	0.19	0.10	0.16	0.29	0.22	0.29	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Negative Affect and Caretaking had weak negative effects. Overall, the model explained 44% of the variance in the Self-Determination dimension of game-based empowerment.

To sum these results, the gameplay activity preferences factors of Aggression and Exploration were both significant precedents for all three game-based empowerment dimensions. The same was true for Positive Affect and weekly play time. However, Negative Affect was found to be negatively associated with both Competence and Self-Determination, providing only partial support for H2a: “Player preferences in both positive and negative emotional responses in gaming are associated with higher game-based psychological empowerment”. Similarly, H2b: “Higher preferences in gameplay activities are associated with higher derived empowerment” was only partly supported as preference in Coordinate was found to be negatively linked with Meaning and Caretaking predicted negatively both Competence and Self-Determination.

Table 5 reports the direct, indirect, and total effects of the GAIN factors, PANAS factors, play time, gender, and age on the three game-based empowerment factors and subjective vitality. From these results we can note that the effects of these antecedents are largely direct and not mediated by play time. The indirect effect via play time enhances the effects of Aggression, Exploration, and Positive Affect on the all three empowerment factors to some extent, but this mediating effect is not statistically significant in any of these cases.

4.3. Does game-based empowerment predict motivation and wellbeing?

The final analysis of this study (RQ3) focused on whether game-based psychological empowerment could be considered to be an antecedent for gaming motives and wellbeing in life. In this, we utilized the PLS-SEM model (Fig. 2) and investigated the structural relations between the three game-based psychological empowerment factors, the eight motives to play videogames, and subjective vitality. We also added daily life psychological empowerment factors to the model to control and elucidate on the potential effects of game-based psychological empowerment factors, in particular.

From Table 4, we observe that the Meaning factor of game-based empowerment predicted all eight gaming motives. Most notably, Meaning predicted the gaming motive of Immersion, but this empowerment factor was also a clear predictor of Achievement, Challenge, Social Interaction, and Escapism. The Competence factor of game-based empowerment most strongly predicted the Relaxation/Mood Management gaming motive, as well as Immersion and Challenge. This empowerment factor was also positively associated with Competition, Social Interaction, Boredom, and Achievement motives. The Self-Determination dimension of game-based empowerment predicted Achievement, Relaxation/Mood Management, and Boredom motives, but generally showed weaker effects than the Competence factor, and even weaker effects

Table 5

Direct, indirect and total effects of GAIN and PANAS factors, play time, gender and age on game empowerment and subjective vitality. Statistically significant values are bolded.

	Meaning			Competence			Self-Determination			Vitality		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Aggression	0.26	0.03	0.28	0.16	0.03	0.19	0.13	0.03	0.15		0.02	0.02
Management	-0.07	-0.01	-0.08	0.06	-0.01	0.05	0.10	-0.01	0.09		-0.01	-0.01
Exploration	0.20	0.06	0.25	0.19	0.06	0.24	0.14	0.05	0.20		0.02	0.02
Coordinate	-0.10	-0.01	-0.12	-0.02	-0.01	-0.04	-0.01	-0.01	-0.02		-0.01	-0.01
Caretaking	0.10	-0.04	0.06	-0.11	-0.04	-0.15	-0.06	-0.04	-0.10		0.01	0.01
Positive Affect	0.26	0.05	0.31	0.40	0.05	0.45	0.38	0.05	0.43		0.02	0.02
Negative Affect	0.01	0.00	0.01	-0.09	0.00	-0.09	-0.10	0.00	-0.11		0.00	0.00
Meaning					0.04			0.04		0.08	0.00	0.08
Competence		0.04						0.03		-0.02	0.01	-0.02
Self-Determination		0.02			0.02					0.01	0.00	0.01
Play Time	0.20	0.02	0.21	0.20	0.02	0.22	0.19	0.02	0.20		0.02	0.02
Male gender		0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00
Age		0.02	0.02		0.02	0.02		0.02	0.02		0.00	0.00

than the Meaning factor, on gaming motives. All three dimensions of game-based empowerment were positively linked with gaming motives, although the effect sizes suggest that the Meaning dimension was a more important predictor than the Competence factor, and even more important than the Self-Determination factor, in predicting higher motivation to play videogames. Thus, H3a was not supported: “All dimensions of game-based empowerment are equally important precedents for gaming motivation”.

In contrast, the Meaning dimension of daily life empowerment negatively predicted the Boredom, Immersion, Social Interaction, and Achievement gaming motives. Similarly, the Competence dimension of daily life empowerment was negatively associated especially with Escapism, but also with Achievement, Immersion, and Challenge as motives to play videogames. Finally, the daily life empowerment factor of Self-Determination weakly negatively predicted the Competition gaming motive but was also found to positively predict Escapism as a gaming motive. With this single exception in mind, these results generally supported H3b: “Lower psychological empowerment in life predicts motivation to play videogames”. The PLS-SEM model explained 39% of the variance in the Immersion motive, but only 10% of the variance in the Boredom motive, indicating that distinct motives to play have different predictors.

Higher values on Meaning and Competence in life in general were both clear antecedents for subjective vitality. Also Meaning in the game-based psychological empowerment was found to be associated with higher general vitality in life. The effect of the game-based Meaning on vitality was weak but statistically significant. Based on this result, H3c was not supported: “Game-based empowerment is not associated with well-being in life in general”. The factors of Game Based Psychological Empowerment and Daily Life Psychological Empowerment explained 39% of the variance in the Subjective Vitality factor.

5. Discussion

The current study had three objectives. Firstly, we aimed to adapt Spreitzer’s Psychological Empowerment Scale [8] for studying game-based psychological empowerment. Secondly, through empirical analysis of a combined representative survey sample from Finland and Denmark (N = 2000), we aimed to examine whether a subgroup of players experiences higher levels of psychological empowerment from gaming than from daily life. And our third goal was to explore the factors related to gratifying game experiences and gameplay habits that predict game-based psychological empowerment and its potential motivational and wellbeing outcomes.

We modified Spreitzer’s model of psychological empowerment to make it possible to assess both game-based empowerment and daily life empowerment. This was done as it is difficult to make sense and flesh out effects of particular game-based empowerment and its constituents

without relating it to the baseline empowerment that individuals experience across their everyday life situations. Our findings shed light on the prevalence and significance of game-based psychological empowerment. A substantial proportion (29.0%) of our survey respondents in the representative samples reported deriving greater psychological empowerment from gaming experiences than from daily life (H1a was supported). Perhaps even more strikingly, 6.5% of survey participants reported deriving more psychological empowerment from gaming on all aspects of psychological empowerment than they did from daily life in general. The participant segments that demonstrated higher game-based psychological empowerment than daily life empowerment also showcased higher engagement with games from the perspectives of gaming motivation and play time (H1b was supported).

Through Partial Least Squares (PLS) modeling based on a modified version of Spreitzer’s nomological network of psychological empowerment (Fig. 2), we identified previously unrevealed associations between player preferences and game-based psychological empowerment (N = 2594). Our results supported the hypothesis that gameplay preferences predict game-based psychological empowerment. However, earlier research had not identified which particular preferences were associated with these empowerment experiences. Our study showed that only Aggression and Exploration from the GAIN preference factors predicted all three dimensions of game-based empowerment. Caretaking was associated with higher Meaning but lower Competence and Self-Determination, while Coordinate predicted Meaning negatively (H2b was partially supported). These findings can have a significant impact on how game developers aim to design game experiences that are more likely to be perceived as psychologically empowering by the players.

Interestingly, the association between exploration and psychological empowerment echoes earlier research on thriving at work, which proposed that exploration enhances vitality [80] and supports learning and innovation [81]. Although our study did not find indirect effects between preference for Exploration and Vitality, Exploration emerged as a significant predictor of all aspects of game-based empowerment. In both game research and psychology, exploration has been closely linked to playfulness — an activity often situated within familiar environments — whereas exploration involves investigative engagement with novel situations [82–84]. Thus, our findings expand the recognized role of exploration as a vital component of empowering gaming experiences.

Our results also provided evidence that Positive Affect is a predictor of all dimensions of game-based psychological empowerment, while Negative Affect was associated with lower Competence and Self-Determination but unrelated to Meaning (H2a was partially supported). Crucially, the effects of Positive Affect or playtime on Meaning were not stronger than those of Aggression and Exploration. This highlights that the specific design of player-game interactions — particularly those involving meaningful aggression and exploration — is crucial for fostering psychological empowerment, rather than merely increasing positive emotions or gaming time.

The analyses further revealed that the Meaning factor of game-based psychological empowerment strongly predicted all eight motives to play video games, particularly Immersion, Achievement, Challenge, and Social Interaction. While Competence predicted Relaxation/Mood Management more strongly than Meaning, its effects on other gaming motives were weaker. Self-Determination had even more modest effects, mainly influencing Achievement and Boredom motives. These findings suggest that the three factors of game-based empowerment are not equally important in predicting gaming motivations (thus, H3a was not supported).

In line with our hypotheses, we found that lower psychological empowerment in daily life and specifically in Meaning and Competence was weakly associated with higher values across several gaming motives, whereas Self-Determination did not show such an effect (H3b was partially supported). Moreover, we observed a weak but significant positive association between game-based Meaning and subjective vitality in daily life, suggesting that empowering gaming experiences can have an additive effect on everyday well-being (H3c was not supported). This finding challenges the assumption that game-based psychological empowerment is isolated from general well-being.

Furthermore, individuals reporting lower psychological empowerment in daily life across all three factors also reported significantly higher gaming time compared to other participants (Table 2). This suggests that these individuals may seek positive psychological experiences through gaming to compensate for what they lack in real life. Our PLS model reinforces this interpretation, as game-based empowerment emerged as the main predictor of motivation to play, whereas daily life empowerment showed only weak associations with gaming motives. Thus, the drive to engage in gaming appears to be largely explained by the empowerment derived from gameplay itself. However, our study was cross-sectional, and therefore we cannot make claims regarding the causality of any of these effects.

The cycle of motivation and gratification highlights how gaming experiences can form a positive feedback loop for players, but it also raises concerns about how such loops might evolve into self-regulation failures, potentially leading to problematic gaming behaviors [56]. For some individuals, gaming may become a method of self-regulation to bolster feelings of meaning, competence, and self-determination. Our findings complement prior studies suggesting that gaming serves as a coping strategy for stress, mood regulation [85], or addressing psychosocial challenges such as low self-efficacy [86,87].

The present findings suggest that when players experience meaning in gameplay, it fuels a wide range of motivational drives, supporting research that highlights games as sources of purpose and narrative identity. The modest effects of Competence and Self-Determination further underscore the centrality of Meaning as a psychological driver of gaming involvement. Findings on daily life empowerment indicate that gaming motivation can partly reflect compensatory processes: lower experiences of Meaning and Competence in everyday life were associated with stronger gaming motives. Most notably, daily life Competence showed a strong negative association with the Escapism motive, suggesting that individuals who feel less capable in real life are especially motivated to use games for psychological escape—aligning with the compensation hypothesis in gaming research [58]. While Meaning in life negatively predicted motives such as Immersion and Social Interaction, Self-Determination in daily life showed only weak associations, suggesting that autonomy outside of games may play a lesser role in motivating gameplay compared to meaning and competence.

5.1. Limitations

One clear limitation of the Game-Based Psychological Empowerment model adopted from the theory-driven model by Spreitzer [8] is the fact that this model does not cover social interaction and its empowering potential in a satisfactory way. Future research should consider developing the model to be more extensive in this regard.

For instance, Seibert et al. [34] and Maynard et al. [33] have both integrated in their meta-analyses social-structural models to the concept of psychological empowerment, including models based on team cooperation, team dynamics, and consequently team empowerment. This is a very potential prospect for future research as the inclusion of cooperation and teamwork-based models to the Game-Based Psychological Empowerment scale enables its applications in esports research and on online multiplayer environments at large.

Furthermore and on a more nuanced level, future research could investigate whether intrapersonal empowerment assessed with the scales utilized in the current research mediate the relationship between social-structural antecedents and behavioral outcomes, as this indeed is how Spreitzer [8] framed the relationships between psychological empowerment and social structures. Moreover and still related to the potential benefits of the current study for esports research, in the context of organizational psychology, empowered individuals have been shown to be also more creative and innovative, arguably because they consider the rules not as much as restrictions but more as grounds for creative actions and novel approaches [27,88]. In the context of organizational psychology, Khan and Ghufan [89] have contended that when employees feel empowered as their work holds meaning and enjoy autonomy, competence, and influence, they are more inclined to exhibit behaviors that benefit the organization and its members and common goals. These effects are very desirable for esports teams and their goals, highlighting the potential benefits of investigating the dynamics of esports team psychological empowerment in particular.

The model for assessing game-based empowerment requires further theoretical refinement, not only by incorporating social empowerment constructs such as team empowerment into its nomological network, but also by systematically addressing organizational factors of the game experience and individual player characteristics as antecedents of psychological empowerment. In this study, we operationalized these dimensions through gameplay activity types and their preference structures, preferences for emotional experiences of positive and negative valence, and total playtime (Fig. 2). However, these constructs are not exhaustive. Future research should also consider additional antecedents such as preferences for game challenge [90,91] and assessments of game element and aesthetic preferences [92].

A related limitation of the current model is that it did not include potentially important constructs such as player personality traits, which could influence both game-based empowerment and gaming motives. By not accounting for individual differences in personality, such as openness to experience or extraversion, the model may overlook factors that explain additional variance in psychological empowerment and players' motivations to engage with games. Future research should therefore consider incorporating these traits as either antecedents or control variables to achieve a more comprehensive understanding of how personal characteristics shape game-based empowerment.

Furthermore, this study relied on cross-sectional survey data, collected from demographically representative samples in two countries and from a sample of more active players. This reliance on cross-sectional data restricts our ability to establish causality. Also, focusing solely on statistical analyses and structured survey questions limited the depth of insights that could be gathered on how players themselves experience psychological empowerment and its dimensions. Future research should employ longitudinal designs to more accurately trace the temporal dynamics of psychological empowerment. It would also be beneficial to incorporate this model into studies examining how players experience specific games, including qualitative data collection and analysis. This mixed-method approach will help validate the model and its key concepts of meaning, competence, and self-determination. In studies that aim to identify antecedents and outcomes of a construct, analyzing only cross-sectional data is not ideal. However, the interactions of our model were based on the theoretical nomological construct of psychological empowerment, and based on this, we argue that they are well-established, albeit limited as we only analyzed cross-sectional data. This highlights the need for more nuanced methodological approaches in future studies to overcome these limitations.

5.2. Future research

Future research on psychological empowerment should be carefully discussed in relation to influential theories of motivation and engagement, including but not limited to the Self-Determination Theory and its many minitheories [93], attribution theory [94], and measures that have been developed for assessing player experience.

Although Spreitzer [8] linked only the aspect of self-determination in the theory of psychological empowerment to the Self-Determination Theory (SDT) framework, competence and impact can also be seen as core tenets of the SDT. Indeed, SDT theorists argue that competence is the second of the three basic human needs alongside autonomy and relatedness [26]. Also, as impact is defined in Spreitzer's [8] theory as the degree to which persons can influence outcomes in their environment, it can be framed to be related to both the needs of autonomy and competence in the SDT framework [24,25].

Within the SDT framework and in game research, the Player Experience of Need Satisfaction (PENS) model has been widely applied when investigating motivational elements of the game experience. The PENS model is based on studying the satisfaction of the three basic human needs of autonomy, competence, and relatedness [10] in an experience. The psychological empowerment scale adopted in this study differs from the PENS model importantly by being based on the theory of psychological empowerment instead of need satisfaction, and also by presenting both the antecedents and potential outcomes of empowerment in its theoretical model. However, future research should consider studying both psychological need satisfaction and psychological empowerment within a single research design and include the Psychological Empowerment Scale and the PENS model for assessing the corresponding constructs. By doing so, future research could empirically investigate how need satisfaction and empowerment are related, and to what extent the PENS model and its factors assess constructs independent or similar to those of the Psychological Empowerment Scale.

The next phase of developing the game-based psychological empowerment model should include longitudinal survey setups and, even more importantly, qualitative phenomenological interviews with individuals who experience deriving more psychological empowerment — whether meaning, competence, self-determination, or some combination of the three — from games than from their life in general. These latter studies could open new discourses for investigating well-being and potential transfer effects of game-based psychological empowerment. Importantly, this line of research could also benefit studies on problem gaming behavior by associating the addictive and problematic gaming patterns to the model of psychological game-based psychological empowerment and its three factors as earlier research has proposed that extensive playing may be a symptom of unfulfilled psychological needs for players with an obsessive play style [56,57]. Future research should also explore whether the identified antecedents and outcomes of game-based empowerment vary across different target groups, such as non-players, mobile gamers, or competitive esports players.

Given the importance of game-based empowerment and especially Meaning, as it had a notable effect both on gaming motivation and on vitality, future research should focus on analyzing what game elements, player preferences, factors related to the gaming situation, and psychological traits predict that game experiences are perceived as meaningful, and if different player types can be identified based on these patterns. This is especially important as recent research has shown that players' own accounts about empowering and disempowering experiences differ from each other based on several factors [22].

While the present study applied PLS-SEM due to its advantages for exploratory model development and prediction-oriented research, future investigations could apply covariance-based structural equation modeling (CB-SEM) to further test and refine the theoretical framework. CB-SEM would enable assessment of overall model fit and a more rigorous evaluation of construct validity, providing complementary

evidence for the robustness of the empowerment and motivation constructs. CB-SEM could also be used to investigate alternative sequential pathways, such as the mediating role of playtime between psychological empowerment experiences and player outcomes. This would enrich the current findings based on a simultaneous model structure and deepen the understanding of empowerment processes in gaming contexts.

5.3. Practical implications

Our study indicates that game-based psychological empowerment, and especially the experienced meaningfulness of game experiences, strongly predicts motivation to play. The results also suggest that player preferences for Aggression, Exploration, and Positive Valence, together with extended playtime, are antecedents for the Meaning factor of empowerment. These associations provide interesting grounds for considering the practical implications of this work.

Game designers can leverage the associations between player preferences for Aggression, Exploration, and Caretaking and the Meaning factor of psychological empowerment to craft game mechanics and narratives that cultivate a sense of purpose and relevance. For example, by incorporating complex, evolving storylines that present morally challenging decisions, designers can mirror real-life challenges and dilemmas. Such narrative complexity encourages players to reflect on their choices and see the consequences of their actions within the game world, thus deepening the sense of meaningful engagement. To further cater to player preferences for Exploration, designers might create rich, open-world environments that reward curiosity and discovery. This could include environmental puzzles that demand thoughtful engagement and character development opportunities that reflect players' choices, further enhancing the perceived meaningfulness of the game. Activities aligned with Exploration can also integrate elements of Aggression, such as combat scenarios and stealth missions, or Caretaking tasks like nurturing and caring, thereby addressing a broader range of player preferences and enriching the gaming experience.

The associations we identified between game-based Meaning and its effects on motivation, and potentially also on general well-being, offer insights for designing game-based and gamified interventions aimed at enhancing well-being or facilitating learning. When creating such interventions, designers should consider how the elements of gameplay that align with individual preferences can be integrated to maximize engagement and effectiveness. Firstly, aiming for empowering game designs is an important goal for any game-based intervention that requires long-term commitment from participants, as perceived empowerment clearly predicts higher motivation to continue playing. Additionally, for interventions aimed at promoting well-being, designers can embed meaningful decision-making opportunities within the game, allowing players to experience consequences that reflect their choices. Finally, the potential for additive well-being effects suggests that game-based interventions should not only focus on the immediate gaming context but also consider how these experiences could support broader life skills and emotional resilience.

Beyond their relevance for entertainment, the findings of this study highlight the broader applicability of psychological empowerment in the domains of learning and well-being. For instance, serious games and gamified learning platforms can be deliberately designed to foster empowerment by aligning tasks with learners' personal values (Meaning), providing adaptive challenges and feedback (Competence), granting autonomy in problem-solving (Self-Determination), and demonstrating visible progress or societal impact. In training contexts, simulations that replicate complex real-world decision-making — such as leadership, crisis management, or collaborative problem-solving — can empower users to develop confidence and a sense of agency that may transfer to professional roles. Similarly, in the realm of psychological well-being, digital interventions can incorporate narrative-driven or sandbox-style game elements that enable users to explore identities, build mastery,

and experience control within safe environments. For example, an open-world game that allows players to shape a virtual community through caregiving, exploration, or conflict resolution can empower different player types by appealing to their dominant preferences and emotional needs. These practical applications suggest that psychological empowerment, as conceptualized through the adapted Spreitzer model in this study, holds promise not only for enhancing game experiences but also for informing the design of purpose-driven games that aim to promote long-term personal development and well-being beyond the game context.

CRedit authorship contribution statement

Jukka Vahlo: Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition, Formal analysis. **Suvi K. Holm:** Writing – original draft, Methodology, Conceptualization. **Johanna K. Kaakinen:** Writing – review & editing, Validation, Methodology, Formal analysis. **Aki Koponen:** Writing – original draft, Project administration, Investigation, Funding acquisition, Formal analysis.

Declaration of competing interest

The authors of this manuscript certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers’ bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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Table A.6
EFA on the Game-based Psychological Empowerment Scale, principal factors and promax rotation. Factor loadings over 0.6 are bolded. The first column lists the dimensions of Spreitzer’s original scale. Loadings and uniqueness for items are reported.

Spreitzer’s [8]	Self-Determination	Meaning	Competence	Uniqn.	
Meaning	-0.02	0.82	0.07	0.28	My game experiences are important to me
Meaning	0.02	0.87	0.00	0.23	My game experiences are personally meaningful to me
Meaning	0.05	0.78	0.02	0.32	Games I play are meaningful to me
Competence	0.02	-0.02	0.84	0.30	I am confident about my abilities when I play in videogames
Competence	0.08	0.04	0.77	0.29	I am self-assured about my capabilities to perform well in videogames
Competence	0.03	0.19	0.66	0.35	I have the skills needed for playing videogames
Self-Determination	0.78	-0.02	0.01	0.41	I have significant autonomy in determining how I act in videogames
Self-Determination	0.77	-0.02	-0.02	0.44	I can decide on my own how to go about as a player of videogames
Self-Determination	0.65	0.20	-0.01	0.39	I have considerable opportunity for independence and freedom in videogames
Impact	0.41	0.24	0.15	0.51	My impact on what happens to me in videogames is large
Impact	0.73	0.03	0.11	0.33	I have a great deal of control over what happens to me in videogames
Impact	0.74	-0.02	0.08	0.39	I have significant influence over what happens to me in videogames

Table A.7
Exploratory factor analysis on the Daily Life Empowerment Scale, principal factors and promax rotation. Factor loadings over 0.6 are bolded. The first columns lists the dimensions of Spreitzer’s [8] original scale. Factor loadings and uniqueness for each item are reported. N = 892, data collected in the US.

Spreitzer’s [8]	Self-Determination	Meaning	Competence	Uniqn.	
Meaning	0.09	0.73	0.03	0.34	My everyday life is very important to me
Meaning	0.05	0.78	0.02	0.31	My everyday life activities are personally meaningful to me
Meaning	0.00	0.78	0.11	0.27	The everyday life I live is meaningful to me
Competence	0.11	0.12	0.67	0.31	I am confident that I can cope in my everyday life situations
Competence	0.19	0.08	0.64	0.27	I am self-assured about my capabilities to do well in activities of my everyday
Competence	0.14	0.07	0.67	0.33	I have the skills needed in everyday life
Self-Determination	0.79	0.06	0.04	0.26	I have significant autonomy in determining how I live my everyday life
Self-Determination	0.73	0.09	0.06	0.30	I can decide on my own how to go about living my everyday life
Self-Determination	0.69	0.11	0.05	0.36	I have the possibility to act independently and freely in my everyday life
Impact	0.42	0.32	0.09	0.45	My impact on what happens in my everyday life is large
Impact	0.76	0.00	0.13	0.27	I have a great deal of control over what happens in my everyday life
Impact	0.81	-0.01	0.08	0.26	I have significant influence over what happens in my everyday life

Appendix. Detailed results of the EFAs and the PLS-SEM measurement model

Since earlier research had not adapted the Psychological Empowerment Scale [8] for assessing game experience or daily life experience, we decided to examine their dimensionality in a separate sample using exploratory factor analysis (EFA).

Participants (N = 892) were recruited via Prolific Academic Ltd. The survey was targeted to the general US population who had reported to have prior experience of playing video games. A total of 49.1% reported to be males, 48.2%, 2.5% non-binary/other, and 0.2% non-disclosed. The mean age of the sample was 38.1 years.

The Kaiser–Meyer–Olkin (KMO) test for sampling adequacy of the game-based versions was 0.93 and for daily life version 0.95. The Bartlett test of sphericity resulted in Chi-square (66) = 7102.767, *p* < 0.001, for game-based version and Chi-square (66) = 8474.987, *p* < 0.001, indicating that the inventories were suitable for factor analyses.

Parallel analyses suggested three-factor solutions for both scales. A factor solution using principal factors and promax rotation identified dimensions of Meaning, Competence, and Self-Determination in both versions. All items showed loading over 0.6 on a single factor, except for one item of both inventories, which showed cross-loadings between Self-Determination and Meaning.

However, the items developed for assessing Impact all loaded very strongly on the Self-Determination factor in both the game-based empowerment and daily life empowerment versions of the scale (see Tables A.6 and A.7). This was not very surprising, as the items developed for assessing Impact described individuals’ perceived effectiveness in their operating environments, a quality commonly associated with autonomy, which corresponds with the operationalization of self-determination in the Spreitzer’s [8] scale.

Table A.8

Measurement model for the PLS-SEM analysis, reporting standardized factor loadings for each reflective composite (N = 2592). Average R-squared: 0.43, Relative goodness-of-fit: 0.96.

	AGGR	MANA	EXPL	COOR	CARE	POS-AF	NEG-AF	GA: ME	GA: CO	GA: S-D	LI: ME	LI: CO	LI: S-D	VITA
Item1	0.90													
Item2	0.83													
Item3	0.89													
Item4	0.85													
Item5	0.87													
Item6	0.84													
Item7	0.89													
Item8	0.87													
Item1		0.77												
Item2		0.85												
Item3		0.84												
Item4		0.86												
Item5		0.80												
Item6		0.82												
Item7		0.84												
Item8		0.86												
Item9		0.82												
Item1			0.89											
Item2			0.82											
Item3			0.90											
Item4			0.89											
Item5			0.80											
Item1				0.60										
Item2				0.77										
Item3				0.89										
Item1					0.83									
Item2					0.93									
Item3					0.72									
Item1						0.76								
Item2						0.76								
Item3						0.82								
Item4						0.66								
Item5						0.86								
Item6						0.66								
Item7						0.87								
Item8						0.83								
Item9						0.82								
Item10						0.84								
Item11						0.78								
Item12						0.80								
Item13						0.84								
Item14						0.84								
Item15						0.86								
Item16						0.81								
Item17						0.76								
Item1							0.78							
Item2							0.76							
Item3							0.85							
Item4							0.85							
Item5							0.77							
Item6							0.85							
Item7							0.83							
Item8							0.85							
Item9							0.73							
Item10							0.84							
Item1								0.94						
Item2								0.96						
Item3								0.94						
Item1									0.95					
Item2									0.96					
Item3									0.94					
Item1										0.95				
Item2										0.96				
Item3										0.94				
Item1											0.86			
Item2											0.90			
Item3											0.92			
Item1												0.92		
Item2												0.90		
Item3												0.85		

(continued on next page)

Table A.8 (continued).

	AGGR	MANA	EXPL	COOR	CARE	POS-AF	NEG-AF	GA: ME	GA: CO	GA: S-D	LI: ME	LI: CO	LI: S-D	VITA
Item1													0.93	
Item2													0.92	
Item3													0.91	
Item1														0.86
Item2														0.68
Item3														0.91
Item4														0.88
Item5														0.83
Item6														0.90
Alpha	0.95	0.94	0.91	0.64	0.79	0.96	0.94	0.94	0.95	0.95	0.88	0.87	0.91	0.92

Data availability

Data will be made available on request.

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