
‘I Just Wanted to Get It Over and Done With’: A Grounded Theory of Psychological Need Frustration in Video Games

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Abstract

Psychological need frustration—experiences like failure, loneliness, or coercion—is emerging as a promising explanation for why people disengage with games and other entertainment media, and how media may induce dysregulated use and ill-being. However, existing research on game-related need frustration relies on general instruments with unclear content validity for games. We also do not know how need frustration arises in video games, nor how it leads to disengagement. We therefore conducted a semi-structured interview study with 12 video game players, following grounded theory methods to develop a model of need-frustrating play. We find that need frustration is a common and impactful experience in games, with distinct antecedents not fully captured in existing measures. Felt need frustration arises when observed need-frustrating events negatively violate expected need frustration or satisfaction; repeated violations update players' expectations, which lead them to modulate or quit play to reduce expected frustration exposure.

Keywords

need frustration, video games, grounded theory, motivation, disengagement, self-determination theory

Introduction

Self-determination theory (SDT; Ryan and Deci, 2017) has become one of the most prominent theories used to understand how people are

motivated and affected by video games and other entertainment media (Rigby and Ryan, 2016; Tyack and Mekler, 2020). While self-determination theory is a broad framework spanning six sub-theories, HCI work has mainly picked up on its three basic psychological needs, posited as key determinants of intrinsic motivation and wellbeing: *autonomy* (the need to feel a sense of control and volition in one's actions), *competence* (the need to feel mastery, effectiveness, and growth), and *relatedness* (the need to feel a sense of connection and belonging) (Ryan and Deci, 2017).

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Satisfaction of basic needs is a strong predictor of enjoyment of both interactive and non-interactive media (Tamborini et al., 2011), including virtual reality applications (Reer et al., 2022), television (Adachi et al., 2018), esports viewership (Qian et al., 2022), and social media (Sheldon et al., 2011). Psychological needs have been especially widely studied in games HCI research (Tyack and Mekler, 2020), where their satisfaction has been linked to greater intrinsic motivation and engagement across genres (e.g., Adinolf and Türkay, 2019; Oliver et al., 2016; Tamborini et al., 2011). Further work has linked need satisfaction in games with various positive wellbeing effects (e.g., Kowert, 2020; Tyack and Wyeth, 2021; Vella et al., 2015).

Just as media use can satisfy basic psychological needs, so too can it actively thwart them, a phenomenon called *need frustration* (Vansteenkiste and Ryan, 2013). Need frustration is not simply the absence of need satisfaction, but a separate construct referring to feelings of being controlled or coerced (*autonomy frustration*), failure and self-doubt (*competence frustration*), or loneliness and exclusion (*relatedness frustration*). Evidence suggests that need satisfaction and need frustration are separate experiences that can coexist to varying degrees (Allen and Anderson, 2018; Vansteenkiste et al., 2020). Just as experiences of need satisfaction fuel wellbeing and intrinsic motivation, experiences of need frustration have been linked to amotivation and deficiencies in health or happiness (i.e., ill-being), such as depression, burnout, and poor physical health (Bartholomew et al., 2011; Ryan et al., 2016; Vansteenkiste et al., 2020).

Need frustration has thus emerged as a possible explanatory mechanism for negative experiences, disengagement, and adverse impacts in media use. Improving our understanding of need frustration can be of use to designers trying to avoid negative user experience and the particular conditions that give rise to these, can help researchers make more testable and falsifiable predictions about for whom and under what conditions media use may have negative effects on a user's wellbeing (Coenen, 2023), and can help players be more aware of mechanics and situations that demotivate them.

This is the mantle we take up in the current paper. Using grounded theory methods on semi-structured interview data, we find that players regularly experience autonomy, competence, and relatedness need frustration during video game play, and that they interpret and respond to these experiences with reference to (sub)conscious expectations of need fulfillment. Our work contributes to HCI games scholarship by: (1) demonstrating that need-frustrating experiences exist and play a distinct role in game selection and (dis)engagement in addition to need *satisfaction*; (2) identifying gameplay-specific mechanisms and types of need frustration, which hadn't been specified in prior general and HCI SDT work; and more generally, (3) highlighting the importance of expectations for player experience and behaviour, and (4) expanding general HCI work on user frustration, identifying *need* frustration as a partially distinct form. This can support the development of more domain-appropriate measurement instruments and new and more detailed falsifiable predictions for games HCI about what features impact gameplay experience and motivation, and how gameplay impacts player wellbeing. For designers, it directs attention toward avoiding need frustration in addition to supporting need satisfaction; provides a lens for differentiating disengagement-inducing negative frustration from neutral or positively-felt frustration (often an explicit design goal; Juul, 2013; Petralito et al., 2017); and highlights *expectation setting* as an important design consideration.

Need Frustration and Media Use

Research on need frustration in media use is approximately a decade old (Sheldon et al., 2011), but begun to grow in prominence in the last five years, and has split into broadly two research topics. In the first of these, research has investigated how need frustration in daily life relates to media use. Using video games or social media may compensate for frustrated needs in everyday life (Ballou et al., 2022; Y. Chen et al., 2021). Need frustration in daily life is associated with dysregulated and obsessive video game play, by which we refer to difficulty controlling one's gaming such that it interferes with

other important life domains. Dysregulated play has previously been linked to the co-occurrence of high need frustration in daily life and high need satisfaction in video games, indicating that compensatory media use can become maladaptive (Allen and Anderson, 2018; Formosa et al., 2022; Mills et al., 2018).

The second line of research has looked at need frustration experiences during media use itself. Gilbert et al. (2021), for example, found that autonomy frustration during smartphone use moderates (or potentially mediates) the relationship between multitasking and stress. In video games research, evidence suggests that need frustration is a salient experience in games (Pusey et al., 2021) with impacts that are separate and distinct to those of need satisfaction (Kosa and Uysal, 2021). Specifically, need frustration in games may be linked to strong negative affective reactions including aggression (Przybylski et al., 2014), disengagement and thoughts of quitting (Kosa and Uysal, 2021; Pusey et al., 2021), and dysregulated gaming (Allen and Anderson, 2018; Kosa and Uysal, 2021).

However, as Tyack and Mekler (2020) note in a recent review, *how* games afford need frustration and how this may shape play behavior and experience remains largely unexplored. This knowledge is of great relevance to designers who wish to avoid negative experiences that lead players to disengage or churn, and want to be able to distinguish ‘positive’, engaging forms of frustration from negative ones (Frommel et al., 2021; Petralito et al., 2017). While we have (largely correlational) evidence that need frustration is linked with lower media engagement, it is not clear that these are the only behavioral consequences, nor what processes give rise to them.

This lack of more detailed knowledge is also due to the quantitative and ‘top-down’ form of most current research on the topic—applying existing general definitions and measurement instruments of need frustration that may lack sufficient domain specificity (Allen and Anderson, 2018; Kosa and Uysal, 2021). Put differently, since we lack basic naturalistic descriptive work, game-related need frustration is currently a largely ‘empirically empty’

construct, which creates the risk that imported measures aimed at capturing it either capture the wrong concept (low construct validity) or fail to capture it in its full breadth (low content validity) (Lasch et al., 2010). This is not a new concern in work on games and self-determination theory (where new questionnaires are frequently validated for particular contexts; Vansteenkiste et al., 2020). For example, Tyack and Wyeth (2017) noted and Kayser et al. (2021) later confirmed that existing need satisfaction questionnaires did not capture all forms of relatedness satisfaction characteristic of games.

Need Frustration and Other Conceptions of Frustration

Need frustration is theorized to be distinct from other conceptualizations of frustration relevant to gaming and media use, such as consumer frustration with a service or product in marketing psychology (González-Gómez et al., 2021), computer user frustration in human-computer interaction (Bessière et al., 2006, e.g.,), affective computing work on automatic frustration detection (e.g., Wolterink and Bakkes, 2021), or the frustration-aggression hypothesis media use and violence research (e.g., Breuer et al., 2015). In games, Gilleade and Dix (2004) distinguish between *in-game frustration* (failure to know how to complete a challenge) and *at-game frustration* (failure to operate the input device).

While varying, these literatures broadly construe frustration as the appraisal of impeded goal attainment, which generates subsequent arousal and negative affect. This has some extensional overlaps with competence frustration (see also Przybylski et al., 2014). That said, without empirical descriptions of psychological need frustration in games, it is hard to say whether it captures different phenomena than ‘frustration’ in other literatures.

Present Study

Taken together, need frustration in games forms part of a larger research movement using psychological

needs to explain negative experiences, disengagement, and adverse impacts around media use. However, existing correlational, quantitative evidence leaves open how, if at all, need frustration empirically manifests in gaming, captured in our first research question:

RQ1. What kinds of need-frustrating experiences, if any, do people report in games?

If we do find that players can report salient need-frustrating experiences in games, the next open question is how they function:

RQ2. What are the antecedents, processes, and engagement effects of need-frustrating experiences in games?

Method

To answer these questions, we chose a qualitative, theory-generating approach. Specifically, we conducted semi-structured interviews with 12 video game players from various backgrounds for efficient access to rich and varied recalled events, using constructivist grounded theory methods (Charmaz, 2006) to develop an empirically grounded model. While traditional grounded theory (particularly in the Glaserian tradition) suggests to ‘bracket’ theoretical preconceptions, contemporary approaches recognize that ingoing theoretical concepts are an unavoidable and indeed productive part of the abductive process of generating grounded theory (Goldkuhl and Cronholm, 2010; Thornberg, 2012). As Kelle (2019) notes, ‘theoretical categories with low empirical content drawn from grand theories are often ideally suited’ to grounded theory generation, as they ‘do not force the data’ (p. 84): this precisely describes our aims to see if need frustration as abstractly conceived in self-determination theory occurs in video game play, and if so, how it manifests and operates. To quote the original *Discovery of Grounded Theory*, ‘categories can be borrowed from existing theory, provided that the data are continually studied to make certain that the categories fit’ (Glaser and Strauss, 1967, pp. 36-37).

Data Collection and Analysis Approach

We constructed interview prompts from descriptions of need frustration from the most recent and comprehensive self-determination theory handbook (Ryan and Deci, 2017) and wordings from the most widely used and well-validated questionnaire for assessing need frustration, the Basic Psychological Need Satisfaction and Frustration Scale (B. Chen et al., 2015) (see Supplementary Materials). Participants were asked to retell in detail recent experiences of need frustration (see Table 1 for example interview prompts). We further included prompts using the colloquial word ‘frustration’ to remain open to potential forms of need frustration not captured in prior conceptualizations. Responses to these questions were only coded as need frustration if players clearly described feelings of being controlled/coerced (autonomy frustration), failure/self-doubt (competence frustration), and disconnection/exclusion (relatedness frustration). While using autonomy, competence, and relatedness frustration as initial codes, we remained open to merging or discarding these categories if they did not fit the data. We did not impose any further specific preconceptions in data collection or coding.

True to grounded theory principles, we iterated between data collection, coding, and memoing: interviews were conducted, transcribed, and coded one at a time, and we repeatedly altered the interview script or redirected participant sampling in response to our ongoing theorizing.

We initially interviewed a subset of four participants aiming to maximize variety in demographics (age, gender) and game genre preferences (as expressed in favorite titles). Subsequent data collection was governed by theoretical sampling, aiming to enrich or challenge evolving categories.

We continued data collection until we reached theoretical saturation for the two primary aspects of the model: the categories of need-frustrating experiences (RQ1), and the core expectations–experience–behavior loop (RQ2). Other aspects of the model may not be fully saturated, and are left for future development. We judged need-frustrating experiences to be saturated after the 10th interview (all new data could be accommodated by the existing

Table 1. Example interview questions and prompts targeting different components of the model. The full semi-structured interview script is available in the supplementary materials.

Model Component	Example Interview Question
Colloquial Frustration	Can you describe a recent situation when you felt frustrated by a game?
Autonomy Frustration	Can you remember a time when gaming that you felt you were being ‘forced’ to do something?
Competence Frustration	Can you think of a time when gaming that you felt ineffective or incapable as a player?
Relatedness Frustration	Can you think of a time when playing a game that you felt socially excluded or disconnected from other players?
Expectations	Had you expected to encounter a situation like this?
Play Behavior	Was there a moment when you thought about continuing to play/picking up the game again?
(Extrinsic) Motivations	When you chose to play the game, what were you hoping to get out of it?

need frustration categories), and the engagement process to be saturated after the 12th interview (all new data could be accounted for by the proposed causal model). Prior work and a recent systematic review on saturation in qualitative research indicate that saturation for well-specified questions and homogeneous populations are reached around 9-12 (Guest et al., 2006) or 9-17 interviews (Hennink and Kaiser, 2022), which broadly aligns with our sample. We return to potential limitations of our sample (size) in the discussion.

We undertook three coding cycles, corresponding to the key stages in constructivist grounded theory (Charmaz, 2006). We began with initial incident-by-incident coding (exploratory, descriptive), then focused coding (using the most significant and frequent codes to sift through data; integrating codes into categories; deciding which codes make the most analytic sense to fully categorize the data), then finally selective coding (specifying possible relationships between categories developed in focused coding). Lastly, we discussed the model with two interviewees to assess whether they found it to accurately characterize their experiences, with both expressing support for our findings.

The first author was the sole coder for all cycles, and regularly consulted with the second author about model development and the coherence of codes. From the perspective of constructivist grounded theory, analysis inescapably requires interpretation influenced by the author’s own subjective experience, and will be affected by the analyst’s biases. Similar to reflexive thematic analysis, constructivist grounded theory generates a

subjective theory that may become *intersubjectively viable* in follow-on theory-testing work (2006, p. 130–131). By extension, ‘using multiple coders does not guarantee against collective idiosyncrasies, nor does it necessarily increase validity [...] two or more coders may agree because they share the same peculiar or limiting assumptions’ (Cornish et al., 2014, p. 81).

Bias, in this view, is not something that can be eliminated, but reflected upon and foregrounded. Thus, rather than having multiple coders, we elected to use the second author in an ‘auditor’ role to guard against unconstrained or unsystematic analysis, to disclose our positionality (see statements below), and to make the data openly available so that others can re-analyze it should they find our analysis unconvincing.

Positionality Statements

First Author I elected to study need frustration in video games because I am interested in what differentiates positive, enjoyable, and well-being gaming experiences with negative and unenjoyable experiences that may undermine well-being. I have played games since childhood, and alongside the countless positive moments, I have also experienced many moments in which games were frustrating and/or need-frustrating, and led to negative effects. Often, these were affected by extrinsic motivations to persist through unpleasant player experiences, such as wanting to collect a trophy for 100% completion.

I chose grounded theory analysis of semi-structured interview data as the qualitative method most familiar to me for generating causal theory.

With my gaming background, interviews also allowed me to position myself as an in-group member and elicit more natural descriptions of gaming experiences.

As a predominantly quantitative researcher, beginning the analysis with existing theoretical constructs offered some alignment with my typical mode of research, which is theory-testing. A substantial portion of my research involves the intersection of self-determination theory (SDT) and video games. I do not accept any psychological theories as ‘true’ in any objective sense, but I do believe SDT to be one of the most well-articulated, empirically supported, and useful theories in the field, and I believe it can offer a lot of insights about video game play. While I do my utmost to remain open to contradictory evidence, I likely maintain a bias towards findings that support SDT’s tenets, including that need frustration exists and has different effects than need satisfaction. However, the fact that themes not included in SDT emerged (e.g., expectation violation) gave me some confidence that theory did not blind me to new patterns.

Second Author As a more casual gaming omnivore, I may be less sensitive to particular frustrations of hardcore or instrumental players. As a white cis male raised and living in the Global North, I expect to be less familiar with and attuned to identity-related frustrations from discrimination or lack of representation, as well as technical and cultural frustrations (infrastructure not working, hardware and titles not readily accessible). I therefore tried to pay particular attention to any mentions of these dimensions in the data.

While my academic training and work has drawn from a wide range of backgrounds, including SDT, my particular interest in symbolic interactionist and socio-material ‘micro-level’ interaction dynamics has led me to ensure that both interview and analysis framing of the present study include wider social interaction ‘around’ a single-player, human-machine gameplay loop. I have begun exploring predictive processing as a candidate model for curiosity and epistemic emotions in human-computer interaction. This likely made me sensitive to the constructed pattern that need frustration arises from negative

expectation violations. However, this code was constructed and proposed by the first author without any prior steer or suggestion from my part. I have conducted and supervised qualitative studies across a range of data sources (online surveys, diaries, interviews, observation, video recording) and analysis methods (various forms of grounded theory, reflexive thematic analysis, microphenomenology, qualitative data analysis). The chosen approach of constructivist grounded theory using semi-structured interviews on critical incidents seemed the most apt against that background and given our topic and resource constraints.

Procedure

We recruited participants on Prolific and via snowball sampling to first complete a screening questionnaire and, if invited, a subsequent video interview. The screening questionnaire was built in Qualtrics and asked participants about demographics (age, gender), their gaming history and preferences (preferred genres), and allowed them to opt in to potentially be invited for an interview. We also asked for but ended up not using information on need frustration in people’s daily life and distress (if any) experienced in relation to their gaming.

From those who opted in, we sampled participants to invite for an approximately 1-hour semi-structured interview. Invited participants could book a suitable time with Calendly and then participate in an interview over Zoom, and could decide whether they wanted the camera on or off (interviewer’s camera was always on). Screening and interviews took place between February 2021 and May 2022.

All interviews were recorded and transcribed using Zoom’s cloud recording service. We reviewed each transcript alongside the audio to correct mistakes of the automated transcription, and removed any potentially identifying information. We then coded each pseudonymized transcript using MaxQDA (VERBI Software, 2022). Supplementary Materials with full interview guide, anonymized data, and coding tree can be found at https://osf.io/mwpqc/?view_only=dfe56f8107c74a7284ba61c0dc571885 (*anonymous link for review*).

Table 2. Interviewee details

Participant	Age	Gender	Country	Favorite games/series
P1	27	Male	UK	League of Legends, Legends of Runeterra, Dark Cloud
P2	21	Male	Portugal	League of Legends, God of War, Rocket League
P3	32	Female	Spain	Final Fantasy 8, The Witcher
P4	30	Female	UK	Kingdom Hearts, Assassin's Creed, Skyrim
P5	18	Male	Chile	Cuphead, Stardew Valley, Fallout
P6	23	Female	UK	Undertale, Life is Strange 2, The Sea Will Claim Everything
P7	21	Female	Canada	Minecraft, Warframe, Call of Duty
P8	42	Non-binary	UK	Mass Effect, Resident Evil, Assassin's Creed
P9	20	Male	Poland	Mass Effect 3, Life is Strange, Minecraft
P10	31	Female	South Africa	Tony Hawk, Grand Theft Auto, Need for Speed
P11	27	Male	Netherlands	Darkest Dungeon, Red Dead Redemption 2, The Witcher 3
P12	31	Prefer not to say	UK	LittleBigPlanet 2, Apex Legends, Hollow Knight

Ethics

The study received ethical approval from [anonymized for review]. Participants were paid £0.50 for the 5-minute screening questionnaire. Those selected for an interview were paid £12/hour for the duration of the interview, which ranged from 39 to 78 minutes. Participants completed separate informed consent forms for screening and interview, the latter including permission to record and share pseudonymized data.

Participants

Participants ($n = 12$) ranged in age from 18 to 42 (Table 2). Interviews lasted between 39 to 78 minutes (total: 110,000 words). Our players resided in a variety of countries, and varied in their gaming history, preferred genres, and the importance of gaming in their life.

Results

Figure 1 presents our resulting grounded theory with four key components. In brief, players approach a game with (1) (unconscious) expectations for the kind and degree of autonomy, competence, and relatedness experiences that play will afford. Based on these expectations, players make decisions about (2) play behavior. Felt need frustration occurs when a (3) need-thwarting situation arises that is *more salient or intense than expected*—this could be autonomy, competence, or relatedness

frustration, or some combination. Over time, repeated, sufficiently salient or intense frustration experiences update players' expectations for future need-related experiences. Expectation shifts result in changes in (2) play behavior aimed to reduce exposure to need frustration, such as 'rushing' through a frustrating section, taking breaks, or quitting the game entirely. Such frustration-reducing adaptations can be inhibited by (4) extrinsic motivations—reasons to continue playing despite expecting it to be need-frustrating.

We discuss each of these components in more detail below, beginning with need-frustrating experiences themselves.

Need frustration

We found substantial evidence that players regularly experience need frustration during gaming. Almost every interviewee easily recalled instances of autonomy, competence, and relatedness frustration during gameplay. Need frustration occurred when an unexpected (or unexpectedly intense) need-frustrating situation arose.

Experiences of need frustration were also associated with certain emotional 'signatures'. Some of these, such as disappointment and annoyance, were shared across all needs, while others were distinct to autonomy, competence, or relatedness. For space reasons, and because the diversity of emotional descriptions limited our ability to saturate these categories, we do not describe emotional

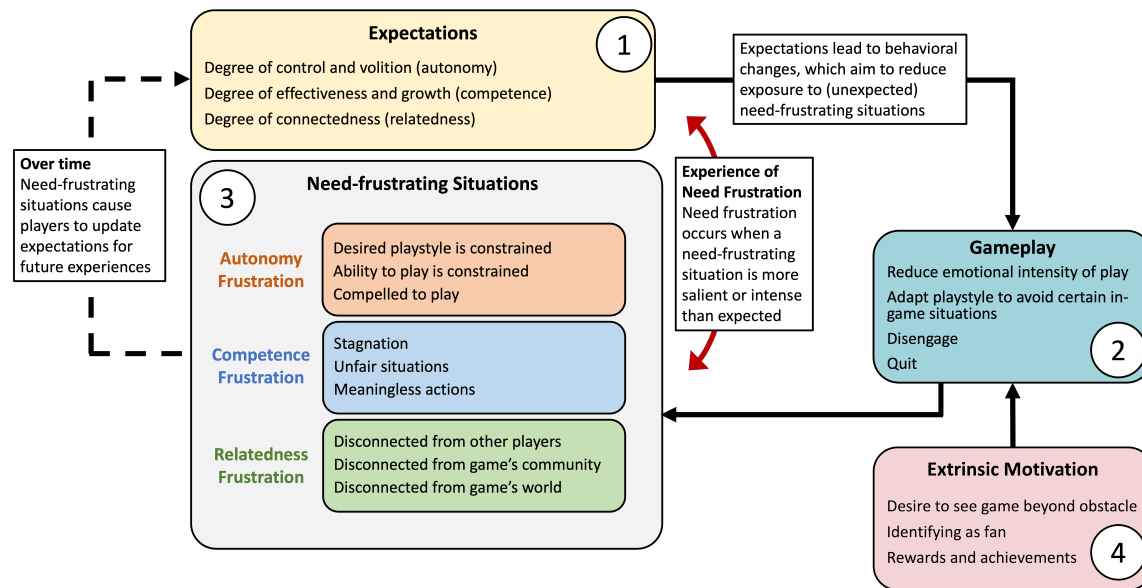


Figure 1. Grounded theory of need frustration in games. Need frustration occurs when players' (1) need-related expectations are negatively violated during (2) gameplay by an (3) unexpectedly salient or intense need-frustrating situation. Over time, need frustration experiences update players' expectations, which in turn prompts alterations to play behavior aimed at reducing future need frustration—unless (4) extrinsic motivations overpower these. The red arrows between (1) expectations and (3) need frustration represent an ongoing comparison process, rather than a causal flow: players constantly evaluate their gaming experiences with reference to their expectations.

signatures here, but these can be found in the Supplementary Materials (https://osf.io/mwpqc/?view_only=dfe56f8107c74a7284ba61c0dc571885, anonymous link for review).

Below, we describe the categories of situations that gave rise to frustration of each need in turn.

Autonomy Frustration We constructed three categories of autonomy-frustrating situations: when a *desired playstyle is constrained*, when the *ability to play is constrained*, or when *players are compelled to play*. The first was the most common: something prevented players from playing how they wanted to play at that moment—e.g., playing a particular character, using particular equipment or abilities, or taking certain in-game decisions. Constraints could arise from other players (e.g., having one's favorite champion or role taken in *Overwatch*), or from the game itself:

Destiny was definitely [a game that restricted my sense of choice or freedom]. [...] You're called Lightbringer. You're expected to be good. [...] the whole premise of the game is that you're going to save everyone. So if you choose anything remotely negative you either don't get as much bonus as you would have or you get penalized. (P8)

Games could also thwart desired playstyles with unskippable segments, such as tutorials or story lines that the player is not interested in:

Nowadays in [*Assassin's Creed* games], when you are pulled out the Animus, it's by force. And they then sort of force you to just do a few sort of mundane actions in the real world [...] And I'm just like 'why are you making me do this? I don't want to

do this, just can I go back in the Animus, please?’ (P4)

A players’ *ability to play is constrained* when constraints on their schedule, hardware availability, finances, or similar prevent them playing a game (when) they want to:

It was too expensive for me to buy [*Mass Effect* Legendary Edition] when it was first released, and I was really disappointed. [...] I love the gameplay and the character interactions [...], but the cost was just too much. (P8)

Lastly, autonomy was frustrated when players felt *compelled to play*. Participants reported this for multiplayer games where there are social pressure or punishment mechanics for early leavers:

We are playing and my mother calls me or I get a phone call, and I really have to go, so I lose interest on [sic] the game, but I keep playing it because I can’t go AFK [...] as] that will result in a ban. [...] I’m playing the game [...] but I’m not willing to play the game. I don’t want it. (P2)

Competence Frustration Three categories of competence-frustrating situations emerged: *stagnation*, *unfair situations*, and *meaningless actions*.

Stagnation describes situations where players feel unable to complete a desired or required action, stifling their progression. This was afforded by an underlying expectation that progress *should* be possible:

I’m like ‘I can play this game, I know how to play it’ but, for whatever reason, every game I go into I just- I can barely get a kill. And I’m just constantly, you know, lowest on the leaderboard and in those moments I do, I feel frustrated at myself. And a little frustrated at the game, because I’m just like ‘I can do this, why can’t I do it now.’

Players describe *unfair situations* as moments where external forces make a desired action or goal attainment practically impossible in a way that violates players’ expectations of being given equal or sufficient means to make winning or losing an expression of their skill. This could be an AI opponent having artificial bonuses, having key information withheld, or playing against significantly stronger opponents or with significantly weaker teammates:

The friend group that I played with, were very, very, like hardcore *Counter Strike* players. [...] And playing *Counter Strike* with them was horrible. [...] I couldn’t do anything, you know. Like, I would spawn into the game, and I’d just die instantly. (P1)

In many cases, feelings around unfair situations were directed outward—at other players, the situation, or the game, rather than at themselves:

At first, I thought it was just my ability in games sort of wasn’t good enough to get past a fight that was made [...] for a player at a difficulty level higher than mine. But when I did keep going and nothing seemed to be making a difference, and then I did kind of change over to the view that [...] the game had just made an enemy that was too hard. (P6)

Finally, some participants reported competence frustration from *meaningless choices*—situations in which the game allows players to make decisions, but these do not have the expected scale of impact, or no impact at all:

[*Outer Worlds*] tended to give you choices between, say, this colony or this corporation, but you can’t save both. [...] And it didn’t matter what you did, you still ended up with the same result. But you know, it made you feel awful, because they get you emotionally invested in the colony, they get you emotionally invested in the corporation and it’s like ‘why can’t you guys work together?’ (P8)

Relatedness Frustration We found three categories of relatedness-frustrating situations: being *disconnected from other players*, *disconnected from the community at large*, and *disconnected from the game's characters or world*.

Being *disconnected from other players* arose when players had disagreements with their teammates, felt that a skill mismatch made for unequal in-game status, and—most commonly—when players were harassed by other players:

As soon as anybody finds out you're a female gamer [in *Call of Duty*], it's sort of immediately like, you know, just preconceived jokes. [...] So it kind of makes it hard to feel included, even on your own team. (P4)

In other cases, relatedness frustration was more generally about being *disconnected from the community*, which could be players of a particular game, or a subset of those players:

There are communities that I felt like I couldn't be part of [...] It's like, in *Apex Legends*, I can easily compete in the top 1% players, the top like 0.5%. But there's always like an exclusive group of like the top 500 players in the world [...]. It can be very, like, cliquey in that space. (P12)

Being *disconnected from the game world* comprises experiences where a game's characters or environment made a player feel alienated, uninterested, or disappointed:

Battlefield might be a good example of that. I really normally don't like a setting that is a battlefield. [laughs] Obviously Battlefield is in a battlefield. But war-themed stuff is not normally my kind of thing and it just feels like- it feels like I'm out of place. It's like, 'why am I playing this game, if this isn't a setting I enjoy to be in?' (P6)

Expectations

Expectations describe what players anticipate from ongoing or future play and shaped need frustration in two ways: serving as a point of reference that determined the salience of need-frustrating situations, and forming the decision-making basis for selecting games and/or in-game behavior.

First, need frustration became salient when play experience violated or negatively deviated from player expectations. Rather than need-frustrating situations necessarily having an immediate negative effect on player experience or motivation, players described interpreting their experiences relative. Violated expectations could be conscious or subconscious and positive or negative: players could expect certain kinds or frequencies of game interactions that ordinarily support autonomy, competence, and relatedness, which then did not occur (such as perceived impact of meaningful choices, a degree of progress and effectiveness, or fairly matched opponents). Similarly, players could expect some (or no) degree of need frustration, which gameplay then negatively exceeded:

[Losing items irretrievably in *Valheim*] definitely blindsided me [...] I should have expected it and anticipated it, but I think I was just sort of so in the zone and kind of enjoying the whole experience and the learning and the things that I gathered and how far it progressed. I think that's what made it more upsetting when it did happen and I knew there was no chance of retrieval at that point. (P4)

These expectations were shaped by prior experiences with that game, similar games, or other knowledge of games more generally:

I played [*Genshin Impact*] for the first month that it came out. And it got to a point where I was kind of logging in just to do kind of like daily stuff. [...] From my experiences with *Dragalia* [a similar mobile game], I was like, I don't want to get into this again. I don't want to just do this daily stuff for no reason. (P1)

Expectations were also set during gameplay by perceived signals from the game. For instance, lack of control over in-game story events would be experienced as less frustrating if the game set the expectation that the story was pre-scripted:

[In *Cyberpunk 2077*], there was a character that died and it felt like I couldn't do anything about it. It felt like he only died to advance the plot, and not even in a very meaningful way at that. [Whereas in *Red Dead Redemption 2*] I'm not here to necessarily decide the story. So there isn't that kind of false promise of 'okay, yes, supposedly I'm supposed to decide the story, but really we're just going to do whatever the developer wants me to.' (P11)

By the same token, when need-frustrating situations were correctly anticipated, expectations would reduce the salience of felt frustration and could mitigate its impact on play behavior. Players who foresaw upcoming need-frustrating experiences could autonomously choose to play regardless. This can create opportunities for positive deviations and pleasant experiences of surprise. One player describes their frustration over lacking Black representation in avatar customisation:

The best thing they've been able to do is change the skin color and maybe the hair, which is not even still close enough. [...] I guess it doesn't make me frustrated again because it's expected, it's not 'oh, really, I'm so heartbroken.' No, it's expected. I expected it from the beginning. But if they do have it in the game, I'll be more encouraged to play or buy. (P7)

Second, expectations played a key role in shaping future gaming behavior. Players tended not to immediately change play behavior in response to a need-frustrating experience. Instead, *repeated experiences* of need frustration shifted their expectations for the enjoyment of future play over time, and these updated expectations then informed their decision-making about future gaming behavior.

If the anticipated need frustration outweighed the anticipated enjoyment (facilitated by the anticipated satisfaction of basic needs), players would choose to alter their behavior:

So if I found that, like, two hour process of beating a boss in *Elden Ring* frustrating, and I really didn't enjoy it, then I'll be thinking 'well I've played this one, so I don't have to feel like I was beaten by it, but do I want more of that? Do I want to have to go through that process again and again to clear this game? And will I enjoy that?' (P12)

While the above example shows expectation and behavioral shifts from session to session, they could also happen during a single game session, especially for competence frustration. Here, negative affect would build up over repeated need-frustrating events, counter-balanced by expectations that some degree of frustration was normal; players changed play behavior (and in the worst case, quit the game) when they felt that continued or repeated attempts would not result in a different, less frustrating outcome:

When you first notice [an overpowered character you feel you have no counterplay against], you're like 'oh, that character is pretty strong.' But the more often you see it, the frequency with which they appear, it gets to a point where it's grating. And it's like 'oh my god, another one', right. And it builds and builds and after a certain point, I straight up just stop playing the game. (P11)

In sum, expectations shape need frustration experiences and resultant behavior: felt need frustration results from the negative delta between expectation and observed situation, while expectations not immediate emotional responses steer player behavior.

Play Behavior

Specifically, in response to current and expected future need-frustrating experiences in the game, participants might alter their behavior to reduce or

eliminate their exposure to need frustration in one of four ways. The first was to reduce the emotional intensity of play. Players would, e.g., rush through a segment, expending minimum time and attention until they pass the need-frustrating situation:

Yeah, because you just rush through it, just to get it over and done with. Get the achievement that you completed the game, and that's all. It's not like 'Oh, let's do every single side quest and get distracted from the main quest.' [...] I just wanted to get it over and done with. (P3)

Second, players may change their in-game behavior to reduce the prevalence and/or salience of need-frustrating events, taking actions such as circumventing or exploiting challenges, moving to a different in-game location, or interacting with others in a different way:

I always did pick up groups [in *World of Warcraft*]. [...] I never stuck with specific people because I didn't want [...] to be known as that person who always held the group back. That was my own assessment of how I played and it wasn't necessarily true to life, and so when I got- when I went in a raid with a pickup group I would be quiet, I would follow instructions. (P8)

Third, players might disengage. At the mildest end, players would simply step away or take a break from the game. Where need-frustrating experiences were more salient, or more frequent and immovable, players may de-prioritize the game, playing less frequently or only due to strong countervailing motives:

[My friends] would ask me to come play [*Counter Strike*] with them. I'd be like, 'please don't make me do this, I don't want to play this game.' And they would keep asking, and then like, you know, I would try one more time, and then get destroyed again, right. [...] And like that- the length of time between, you know, me refusing

to and me saying 'yes, okay, I'll play one more time' gets longer and longer, until I just don't play again. (P1)

Fourth, in response to the strongest or most persistent need-frustrating experiences, many players chose to quit the game entirely:

[In *Zuma*] you're shooting bubbles [...] and it's just coming so quickly that you can't do it. And I remember being super frustrated at that. [...] You know, it shouldn't be that hard. But yeah, that was one I had to put down and not pick up again because I just- it made me feel incapable. A failure. (P8)

Extrinsic Motivation

As can be seen in the above *Counter-Strike* example, players sometimes reported persisting play despite repeated need frustration. Often, that was because pressures or anticipated rewards external to the need-frustrating gameplay 'outweighed' undesirable frustration. We refer to these as extrinsic motivation in the broad sense of motives that are not inherent to performing the activity itself. Three categories stood out: *a desire to see the game beyond the obstacle*, *identifying as a fan*, and *rewards and achievements*.

The most prevalent extrinsic motivation was *a desire to see the game world beyond*—be it appealing characters, an interesting narrative, or beautiful visual design, players had positive expectations for future portions of the game, and would push through the temporary need frustration:

Like going through a Water Temple in *Zelda* or something, right? [laughs] Like no one, no one likes that shit. But the rest of the game is beyond this Water Temple. So you kind of have to slog through it. (P1)

In other cases, players persisted because they *identified as a fan* of a franchise and felt some obligation to that identity. In the following example, expected future positive gameplay and fan identity mix:

But I had to [finish *Final Fantasy XIII*], because I felt like I was obliged to as a *Final Fantasy* fan [...] And play the sequel which is also very bad, and get to the end of that. [...] It's more of like, to see if it suddenly becomes better or to fulfill your duty as a fan. (P3)

Lastly, participants reported being extrinsically motivated by in-game *rewards and achievements*:

[In *Subway Surfer*] you have to find different shells [...]. So whilst playing, it was quite frustrating when the actual shells will be up, but I couldn't jump as high. But it kept motivating me because I knew that if I got the shells, I will be able to get a prize or a mystery box or something. (P7)

While these categories do not exhaust the extrinsic motivators we observed, they demonstrate that need frustration does not singularly determine play behavior; rather, play behavior results from a conscious or unconscious weighing of actual current and expected future consequences.

Discussion

At the broadest level, our results support that need frustration is an important recurring experience in video game play that impacts experience and behavior. Players easily recalled a variety of autonomy-, competence-, and relatedness-frustrating situations that linked to distinct negative experiences and subsequent play adaptations via changing expectations. Our findings furnish empirical content to game-related autonomy, competence, and relatedness need frustration, and show that these are indeed separate: each was triggered by distinct situations, and showed some distinct experiential signatures.

We hope our model can make a contribution in a few distinct areas of games HCI research and design practice: (1) highlighting the importance of need frustration above and beyond need satisfaction in predicting player retention and in-game behavior; (2) informing more domain-appropriate questionnaires and specific follow-on work; (3) identifying expectations as a crucial, to date largely unformalized factor

in both design and user experience research; and (4) expanding general HCI work on user frustration, offering a potential way of differentiating desirable, motivating frustration from negative, demotivating frustration. Each of these is discussed in turn below.

Need Frustration and Player Experience, Behavior, and Retention

First and foremost, our data lends method-triangulating support to prior quantitative work (Allen and Anderson, 2018; Kosa and Uysal, 2021; Pusey et al., 2021) that need frustration is indeed a distinct player experience separate from need satisfaction, with a distinct, separable impact on player behavior and engagement. Our participants indicated that need frustration was an important factor in selecting games and in-game activities, beyond simply the absence of need satisfaction. Designers interested in player retention may therefore prioritize the avoidance of need-frustrating interactions separately from the well-established goal of affording need satisfying situations. This might similarly also be a way of analyzing and understanding design decisions in commercially successful games, such as the well-publicized tendency of allies in *God of War: Ragnarök* to solve puzzles on the player's behalf after only a short delay (Kennedy, 2022)—the impact of this decision might be understood as a trade-off between reduced autonomy and competence satisfaction in players who were likely to solve the puzzle imminently and averted competence frustration in players who may have been truly stuck.

Detail Measurement, Testing and Design

Prior work on need frustration has remained at the general level of establishing *whether* need frustration impacts experience and behaviour. Here, our model fills in the *how*, identifying nine types of need-frustrating moments and particular mechanics by which these arise from and impact gameplay.

This empirical content shows the limitations of existing measurement instruments for need frustration in games. Current instruments use a modified version of the Basic Psychological Need

Satisfaction and Frustration scale (B. Chen et al., 2015), either pre-pending ‘when I play video games’ to each item (Allen and Anderson, 2018), or adding ‘in my [current favorite online game]’ in the middle (Kosa and Uysal, 2021). While many of the scale’s frustration items abstractly match experiences reported by our players, our players also reported need-frustrating experiences not captured in these items, like perceived unfairness, meaningless actions, or having one’s desire to play or desired playstyle constrained. Other items, such as the autonomy frustration item ‘My daily activities feel like a chain of obligations’, do not nearly map onto the experiences described by our players. In other words, our results suggest that current scales lack content validity for the domain of video game play. We therefore advocate further work on domain-appropriate measurement instruments, and suggest that our model might be a useful foundation for operationalizing the full range of possible need-frustrating situations in a quantitative form.

Secondly, our theory makes more specific predictions about gameplay-related need frustration that invite and require rigorous hypothesis-testing work – the present work is, after all, theory-generating, not theory-testing. We note that the need-frustrating situations we constructed are *emergent* products of individual, game design, and gaming context factors. Future research could increase the ‘resolution’ of these factors and their interaction to make more precise predictions about when need frustration will occur. We see this path as being full of intriguing research opportunities, such as experimental comparisons of differing versions of a mechanic to see which one is associated with greater need frustration (e.g., how do different implementations of a stun mechanic in hero shooters affect opponents’ competence or autonomy frustration, related to prior expectations of typical stun lengths?) By the same token, researchers could investigate what player characteristics affect need frustration with regard to the same game—for example, what big 5 personality characteristics are associated with experiencing relatedness frustration more intensely in a team-based game like *League of Legends*?

The Role of Expectations

A third, more general upshot of our findings is that *expectations* modulate both need frustration experiences and behavioral consequences. To our knowledge, mainstream and game-specific self-determination theory work to date has not explicitly identified expectations to play a role here (although see Hagger and Chatzisarantis, 2009 for a counter-example combining self-determination theory with the theory of planned behavior, showing that expected consequences about a behavior shape engagement intention). SDT-informed researchers may therefore be missing a crucial component of motivational processes. Cognitive evaluation theory, a main sub-theory of SDT, specifies that people appraise the functional significance of an event as informational, controlling, or amotivating, which will shape need satisfaction (Ryan and Deci, 2017, p. 130). Need satisfaction in an activity will lead to enjoyment, which will then increase intrinsic motivation to continue the activity (2017, p. 117; cf. Ryan et al., 2006 for games). In this model, appraisal occurs but chiefly impacts need satisfaction, which mainly energises continued ‘consummatory’ behavior. In contrast, our findings suggest that (a) appraisal includes comparing actual with expected need frustration, (b) salience of experienced frustration arises from the delta between the two, and (c) observable motivation in the form of behavioral persistence and intensity is not directly driven by felt frustration (as the inverse of enjoyment), but by *expected future frustration*, (d) which also shapes ‘appetitive’ or satisfaction-seeking behavior (such as choosing a particular game and start playing it).

In wider media research, expectations have been chiefly theorised in Burgoon’s expectancy violation theory (Burgoon, 2015). Originally developed for proxemics (people’s preferred interpersonal spatial distance), the theory predicts among other things that positive and negative violations of expectations disproportionately affect our evaluations of other social agents. It has seen some prior use in HCI (Bonito et al., 1999) and more recent applications in the study of artificial agents (Burgoon et al., 2016; Lew and Walther, 2023). Yet in HCI more

generally, the potential importance of expectations for user frustration and other factors has been largely neglected (Noyes, 2006).

The role expectations play in our model interestingly aligns not just with expectancy violation theory (negative violations produce salient negative evaluations), but also with the predictive processing account of cognition (Clark, 2016). This account asserts that human perception and action consist of generating (subconscious) predictions about the world and comparing these to actual observations, where mismatches produce prediction error. Motivation is a function of expected error reduction, and positive and negative affect emerge from the delta between expected and *actual* error reduction: we continue to engage in an activity as long as we expect it to progress us toward desired states, and feel good (or bad) when we actually progress better (or worse) than expected (Van De Cruys, 2017). A budding strand of mostly theoretical research has applied this model to play (Andersen et al., 2022) and video games (Deterding et al., 2022). Our findings suggest that at least for negative, need-frustrating experiences, predictive processing tracks players' self-reported experiences and behavior well: frustration arises from the delta of expectations and observed events; things going 'worse than expected' are felt negatively; and motivation to continue playing is tied to expectations, not immediate positive or negative experience.

Taken together, our findings invite future empirical research into the role of (conscious and unconscious) expectations in gaming and human-computer interaction, and self-determination theory research more broadly. Specifically, it stands to reason that our findings generalize from need frustration to satisfaction: players should have expectations about both. Under our model, need satisfaction should arise and be (most) salient if events positively exceed expectations, and *expected* need satisfaction should fuel game selection as well as continued play. This would also align with predictive processing and partially, expectancy violation theory predictions.

A related upshot of our findings concerns the timescales at which need frustration, motivation, and gaming operate. Here, our model supports and

extends that put forth by Melhart (2018). Melh rt observes that players are usually intrinsically motivated to play on the overall *contextual* level of a gaming session. *Moment-to-moment* frustration might then disrupt need satisfaction on the *situational* level of a game segment (such as a level), leading players to temporarily shift orientation toward extrinsic motivations, which would 'bridge the gap' to the next need-satisfying gameplay segment. We similarly observed extrinsic motivators sustaining play in need-frustrating moments at various 'in-game' time scales. However, we found that changes in expectations or behavior are more likely to happen at longer, session-to-session time scales.

We hypothesize that at shorter, moment-to-moment or segment-to-segment time scales, players expect occasional frustration, while they expect overall enjoyable gameplay at session and session-to-session timescales. Thus, while occasional momentary or even segment-level need frustrations are unpleasant, they do not violate expectations and hence, do not impact contextual motivation to continue playing. Instead, *repeated or sustained* segment- or session-length need frustration experiences violate and update expectations. Experiences over time update and generalize into ever-more global expectations (about a game, game series, game genre, or gaming overall), which then top-down modulate players' gaming selection, persistence, and incoming expectations for a particular game or session. Thus, our model points to a 'sliding time and generality scale' of bottom-up learning informing ever more global expectations and back, ranging from moment-to-moment play to the whole domain of gaming.

In terms of design implications, these findings suggest that (positive and negative) expectation violation may deserve particular attention; rather than aiming for a blanket 'good' or 'need-satisfying' experience, our findings invite designers to ask what (biographical, genre-specific, series-specific) expectations their audiences are likely to bring, and to focus ideation and formative evaluation around positively, not negatively violating these expectations. The nine specific need-frustrating situations our model identifies can here serve

as heuristics or ‘strong concepts’. Our findings also suggest that *expectation-setting* could be an important design consideration. For instance, by introducing explicit, up-front labels of its levels, *Candy Crush Saga* may have helped set player expectations and thereby reduce felt frustration despite repeated failings at hard levels.

Relation to Other Conceptualizations of Frustration

Finally, while not the focus of our study, our findings also indicate that need frustration does not equate to previous conceptions of general, consumer, or computer user frustration (Bessi re et al., 2006; Dollard et al., 1939; Gonz lez-G mez et al., 2021). Frustration as impeded goal-directed action ‘fits’ a range of the autonomy- and competence-frustrating situations we found; for example, our categories of constrained playstyle and unfair situations overlap with appraisal theory-informed findings that consumer frustration is occasioned by perceived lack of personal control and unfairness (2021). Yet other situations (such as compulsion to play and disconnection) do not fit, and many of the negative feelings characterising need frustration are not reported in other frustration literatures. As need frustration was near-universally experienced as negative, we believe that need frustration could offer an explanatory mechanism for differentiating negative and positive experiences of frustration, which are frequently reported in video game play (Frommel et al., 2021; Petralito et al., 2017). Perceiving one’s goal-directed action to be impeded *without* feeling controlled, ineffective, or excluded (i.e., *need-frustrated*) may set apart the positive, motivating experiences of wanting to get past a difficult obstacle from negatively valenced instances where goal attainment *and* needs are frustrated. Similarly, need-frustrating frustration may be more likely to induce aggression (supported, e.g., by Przybylski et al., 2014).

Limitations

Despite purposive sampling for variety, our sample remained relatively homogeneous: all participants

were between 18 and 42 years of age and all but two came from the Global North. Participants’ stated favorite games were exclusively commercially successful console and PC games; participants did discuss mobile games during interviews, but none listed one as an all-time favorite. While we do not expect that cultural and game platform differences would challenge the core process model and categories of our theory, different contexts might give rise to additional, distinct need-frustrating situations.

During coding, we uncovered evidence of several mitigating and exacerbating factors that affected the salience of need-frustrating situations, such as having a preexisting low mood during play or consciously devaluing the experience. These were highly varied within and across participants, thus preventing us from theoretically saturating them as categories; for this reason, we did not specify them in our model. We are confident, however, that they are moderators rather than core processes, and that their under-saturation therefore does not impact the validity of the core expectations-play behavior-need frustration loop and need frustration categories, which are well-saturated. We encourage interested readers to review the coding tree in the supplementary materials for further detail.

The above limitations are both connected to our sample size of just 12 participants. With narrow research questions and a relatively homogeneous sample, we were able to achieve saturation of the core need frustration categories and process relatively quickly. However, this came with a trade-off of limited diversity of players and gaming experiences present in the data, and the total amount of data with which to theorize about moderators. While we are confident that this sample allowed us to address our research questions effectively and is line with existing recommendations for achieving 90%+ theoretical saturation (9–17 interviews; Guest et al., 2006; Hennink and Kaiser, 2022), we nonetheless hope to further develop and test the model with more diverse players and games, and encourage readers to participate in this.

Conclusion

Our findings suggest that autonomy, competence, and relatedness need frustration are common experiences in video game play that impact play behavior and disengagement, mediated by expectations, and differ in empirical content from domain-general conceptions of frustration and need frustration. Our presented model is testable and can inform more domain-appropriate measurement instruments. It provides pointers for designers wishing to avoid disengagement-inducing forms of frustration in their games. It invites self-determination theory and media researchers to direct more attention to the role of expectations for motivation and experience, and how they play out across time and generality scales. Finally, it offers starting points for describing how negatively experienced frustration differs from neutrally or positively felt frustration.

Data, Code, and Materials Availability

All data, code, and materials associated with this project are available on the Open Science Framework (https://osf.io/mwpqc/?view_only=dfe56f8107c74a7284ba61c0dc571885, anonymous link for review).

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