Chapter 8
Self-Determination Theory in Digital Games

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Abstract Self-determination theory (SDT; Intrinsic motivation and self-determination in human behavior, New York, 1985; The oxford handbook of human motivation, New York, pp 85–107, 2012) is a broad motivational theory that has been developing for the last four decades. The theory makes the distinction between intrinsic and extrinsic motivation and identifies three basic psychological needs that are essential for well-being. When people are intrinsically motivated, they engage in an activity because the activity itself is interesting, enjoyable, and congruent with their selves. In contrast, when people are extrinsically motivated, they engage in an activity because the activity is instrumental in obtaining rewards or avoiding punishments. In this chapter, we will discuss digital games within a SDT framework, with a focus on how satisfaction of basic psychological needs in games can enhance user experience. We start with the behavioral psychology principles and the use of rewards in games that fuel extrinsic motivation. Next, we discuss intrinsic–extrinsic motivation and the three basic psychological needs—autonomy, competence, and relatedness—that facilitate intrinsic motivation and enhance player experience. Finally, we discuss some basic game features and their relation to basic needs.

Keywords Digital games • Motivation • Self-determination theory

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8.1 Behavioral Psychology

Behaviorism was the dominant view in mainstream psychology until the 1960s. This school of thought was based on the idea that psychology should only study observable and measurable behavior, and rejected the idea that the mind or cognitive processes can be studied scientifically. Although mainstream psychology moved away from behaviorism, basic principles of behavioral psychology are commonly used in games, and they provide some insight about gamer behaviors. Moreover, these principles are important to understand the intrinsic and extrinsic motivation distinction.

According to the operant theory (Skinner 1953), behaviors are learned and motivated by rewards and punishments. That is, behaviors that are reinforced will be strengthened, whereas behaviors that are punished will be extinguished. For example, a pigeon that is rewarded with a food pellet each time after pecking a button when a light turns green will eventually learn to peck the button when it sees the green light. Thus, desired behaviors can be taught and motivated by rewards. Behaviorist approach also suggests that human behaviors operate similarly, and our behaviors are conditioned via various types of reinforcements (social, material, etc.) and punishments.

8.1.1 Schedules of Reinforcement and Games

In order to reinforce a behavior, rewards can be provided contingent on a number of responses or contingent on a time interval (Ferster and Skinner 1957). For example, the pigeon may receive a food pellet every fifth time it presses the button, or after variable number of button presses. Similarly, the pigeon may receive the food once in every 2 min, or once after variable number of minutes passed.

These different types of requirements for the delivery of reinforcement are labeled as schedules of reinforcement. Apart from continuous reinforcement, where a behavior is rewarded every time, there are four basic types of reinforcement schedules. Number of response-contingent ones are called ratio schedules, whereas, time-contingent ones are called interval schedules.

A fixed ratio schedule indicates that the response will be reinforced after a fixed number of responses. In our pigeon example, a pigeon on a fixed ratio 5 (FR 5) schedule would receive a food pellet each time after pecking the button five times. This kind of schedule results in a high rate of response (pecking the button), with a short pause after the reinforcement (food), which is called a "break and run pattern."

Fixed ratio schedule is used in games frequently. Some basic examples are killing a fixed number of monsters (response) to level up (reinforcement), or collecting a fixed number of items to increase the player's health bar. A fixed ratio 1 is a continuous reinforcement, and probably the most common type of schedule used

in games. Gaining points, experience, or special rewards each time after certain game actions are some examples of continuous reinforcement. The break pattern after reinforcement can happen outside or within the game. For instance, in an RPG game, a player is more likely to keep playing until her character reaches the next level or finishes a quest before taking a break. These breaks can also take place within the game's world. For instance, if this is an open world game that allows exploration, the player initially may focus on obtaining the rewards provided by the quests, and then explore the game's world for some time before returning back to questing.

A variable ratio schedule indicates that the response will be reinforced after an unpredictable number of responses, within a set average response rate. For instance, a pigeon on a VR5 schedule might receive the first food pellet after 4 pecks, the second one after 10 pecks, and the third one after 1 peck, averaging to 5 responses for each reinforcer. This kind of schedule results in a high rate steady response pattern (linear) with very brief or no breaks.

A classic example of variable ratio schedule is gambling or lottery games. For example, slot machines use this kind of schedule that results in a very high response rate. As the players know they will eventually win, they keep playing to receive the reward. After receiving the reward, there is still the possibility that the next coin may also produce rewards. In digital games, "loots" are generally based on a variable ratio schedule. The players do not know how many creatures they have to kill before obtaining the special item that these creatures drop. Moreover, the players may even find the task boring, but the probability of obtaining the special reward results in a steady high response rate. Similarly, simple Facebook games also frequently use variable ratio schedules (Lewis et al. 2012).

A fixed interval schedule indicates that the response will be reinforced after a fixed period of time. For example, a pigeon on a one minute fixed interval schedule will receive food for its first peck after 1 minute elapses. Another minute needs to pass before the second food is delivered, and any number of pecks in between is not rewarded. Fixed interval schedules lead to a longer pause after the reinforcement and a gradually increasing response rate (i.e., a scalloped curve) as the reinforcement time approaches.

Browser games and Facebook games use this kind of schedule frequently. For instance, the game can provide various rewards for logging in once within a fixed time period. This could be a positive reinforcer such as a reward (e.g., daily in-game currency reward for logging in) or a negative reinforcer such as preventing an undesirable outcome (renewing the magical shield of your city, protecting your space fleet, protecting your crops from withering, etc.). The response pattern is a gradually increasing curve. For example, a game can reward the player for logging in every three hours. The player will log in to receive the reward, do something else for a couple of hours, and start checking the game more and more frequently until the next interval's reward is available (unless there is a countdown timer in the game, but then checking the timer may become more frequent).

Fixed interval schedules are especially effective for negative reinforcers in games. For instance, on Clash of Clans wiki website, a player inquires "Can I keep

myself from being attacked by always staying online and active; presuming that I got something to touch my device once per minute?" Another player responds "Yes you can, in fact I've seen many people do this." Some free-to-play games take advantage of this schedule. These games are free, but the player is not allowed to do highly rewarding game actions until a fixed amount of time passes, unless the player pays real money. The players can receive the reward immediately, instead of waiting for the fixed interval, if they pay. The case of the Facebook application "Cow Clicker" is an ironic example for the potency of fixed interval schedules, which is discussed thoroughly by Lewis et al. (2012).

A variable interval schedule indicates that the response will be reinforced after an unpredictable period of time, within a previously set average period. For instance, on a 15 minute variable interval schedule, the response is reinforced in variable time periods that would average up to 15 minutes. Variable interval schedules result in a moderate steady response rate with very brief or no pauses. The response rate of variable interval schedule is less steep than that of variable ratio schedule. In fact, interval schedules in general result in lower response rates than ratio schedules.

In games, variable interval schedules can also be used instead of fixed interval or variable ratio schedules. For instance, in an MMO game, a special quest might become available based on a variable interval schedule. Similarly, browser game examples discussed above can also use variable interval schedules.

8.2 Self-Determination Theory and the Undermining Effect of Rewards on Intrinsic Motivation

According to the self-determination theory (SDT) (Deci and Ryan 1985), extrinsic motivation is defined as doing an activity to obtain an outcome that is separable from the activity. Thus, operant theory principles we discussed above fall under extrinsic motivation. Intrinsic motivation, in contrast, entails engaging in an activity because it is inherently interesting and satisfactory. These activities are volitional, lead to feelings of being effective, and provide opportunities for growth (Ryan and Deci 2000a). SDT also states that people have an inherent tendency toward intrinsically motivated activities and growth.

Research on SDT began with the controversial finding that rewards could have a negative effect on intrinsic motivation (Deci 1971). Initial study with university students showed that monetary rewards decreased intrinsic motivation for an interesting activity. The findings were subsequently replicated with preschoolers using symbolic rewards (Lepper et al. 1973). Research on this topic continued in the following years showing that in addition to tangible rewards, threats (Deci and Cascio 1972), deadlines (Amabile et al. 1976), and directives (Koestner et al. 1984) can also decrease intrinsic motivation. This negative effect of reinforcers on intrinsic motivation was labeled as the undermining effect (Deci and Ryan 1980).

However, the issue remained to be controversial as Eisenberger and Cameron (1996) conducted a meta-analysis concluding that undermining effect is a myth and these detrimental effects occur under highly restrictive conditions. In response, Deci et al. (1999) conducted an extensive meta-analysis of 128 studies, concluding that the undermining effect is a reality and the meta-analysis of Eisenberger and colleagues had methodological problems along with misunderstandings of SDT.

Rewards can have a negative effect on intrinsic motivation, but not all rewards are undermining. According to SDT, rewards have an informational and a controlling aspect, and their effect on intrinsic motivation depends on which aspect is perceived as more salient. Informational aspect of rewards refers to their role as performance or competence feedback. When this aspect is salient, rewards maintain or enhance intrinsic motivation. In contrast, the controlling aspect of rewards refers to their role as an instrument for controlling people's behavior. When this aspect is salient, rewards undermine intrinsic motivation (Ryan and Deci 2000a). In general, expected tangible rewards such as money or awards tend to undermine intrinsic motivation. In contrast, verbal rewards such as positive feedback or praise tend to enhance intrinsic motivation (Deci et al. 1999).

8.2.1 Intrinsic and Extrinsic Motivation in Games

At a first glance, intrinsic motivation seems like the essential element of games. Why would people play a game if they do not find it interesting and they are not having fun? However, as we discussed in the first section of this article, games can put people in a Skinner box. People do play games with extrinsic motivation for reasons such as gaining in-game awards and prestige (Lafrenière et al. 2012). Moreover, there could be extrinsically motivated sections within a game, even if the overall motivation for playing the game is not extrinsic. In fact, player terms such as "grinding" or "farming" refer to these activities that are merely done to obtain the rewards. Thus, whether such extrinsic rewards also undermine intrinsic motivation in games is an important question. In the recent years, researchers began to investigate intrinsic and extrinsic motivation in games; however, the literature on this topic is still limited.

In an experimental study, researchers investigated the effect of feedback valence and type of feedback (descriptive, evaluative, comparative) on intrinsic motivation (Burgers et al. 2015). It was found that positive feedback increased intrinsic motivation as the players felt more competent and autonomous (these constructs are discussed in the following section). Negative feedback, however, increased the desire to play the game immediately, probably as an effort to repair low performance. Feedback type did not have a significant effect on intrinsic motivation and the findings regarding future play were mixed.

Modern games also make use of meta-rewards such as achievements, badges, or trophies. These are rewards that are generally given for completing a game objective. Furthermore, the platforms using these rewards (e.g., PlayStation, Xbox,

and Steam) allow displaying or comparison of these rewards to other players. A recent qualitative study examined the motivational aspects of meta-rewards (Cruz et al. in press). After conducting focus groups, researchers concluded that achievement badges can be perceived as informational or controlling rewards, lead to gameplay experimentation, create feelings of competence, maintain or boost ego, and act as social status or skill indicators. Some players also reported feeling compelled to earn all available rewards. It seems there are some intrinsic aspects of meta-reward systems such as their competence supporting and gameplay experimentation properties, as well as, extrinsic aspects such as ego-maintenance or social comparison properties. The extrinsic aspects of meta-reward systems are likely to extend play time, but also likely to undermine intrinsic motivation and game enjoyment.

Similarly, gamification in nondigital contexts also uses meta-rewards. Although the findings regarding effectiveness of gamification are mixed and dependent on various factors (Hamari et al. 2014), a more recent longitudinal study addressing some of the shortcomings of previous studies on gamification found that use of badges in educational settings (along with other gamification elements) lowered intrinsic motivation, course satisfaction, and course grades compared to the non-gamified control classroom (Hanus and Fox 2015). In another similar study, badges did not decrease student's motivation, interest, and engagement, but increased their understanding in an educational game (Filsecker and Hickey 2014). However, researchers concluded that badges provided in the game were unexpected and emphasized their informational aspect rather than controlling aspect; therefore, they did not undermine intrinsic motivation.

From a game designer's perspective, it might be suggested that it does not matter whether a player is extrinsically or intrinsically motivated, as long as the players are motivated. However, designers need to be aware of the consequences of extrinsically motivated game playing. For example, research shows that extrinsic reasons for playing a game such as playing apathetically, obtaining in-game rewards and items, gaining social recognition, and release of tension or guilt significantly predict excessive and problem gaming (King and Delfabbro 2009). Similarly, extrinsic motivation for playing games is linked with obsessive passion, an unhealthy type of passion in which the person feels compelled to engage in the activity that contradicts with other aspects of one's life, as opposed to harmonious passion that is more self-determined and generally leads to positive outcomes (Przybylski et al. 2009a, b; Wang et al. 2008). Thus, these findings suggest that extrinsic motivation in games can increase playing time with a cost to well-being of players.

In sum, the undermining effect of extrinsic rewards in games depends on whether they are perceived as controlling or informational. Furthermore, there is no doubt that use of operant theory principles increases extrinsic motivation, play time, and could even lead to addictive playing. Player communities invented words such as grinding and farming that refer to doing the same in-game action over and over again to obtain the desired reward that is on a type of schedule of reinforcement. However, these words also have negative connotations. Anecdotal evidence suggests that players find these sections dull and boring, something they "have to" do to

obtain the reward. How these sections of games have an effect on player's intrinsic motivation and overall game experience is yet to be investigated empirically. Nevertheless, intrinsic motivation is essential for enjoyment and fun. We now turn our attention to how intrinsic motivation can be facilitated in games.

8.2.2 Basic Psychological Needs

According to SDT, people have three basic psychological needs—autonomy, competence, and relatedness—that are essential for well-being and psychological growth. Autonomy refers to feeling volitional in one's actions and fully endorsing them. Activities that are imposed, controlling, or in conflict with one's true self are detrimental to autonomy needs. Competence refers to feeling effective, capable, and optimally challenged. Activities that are too easy or too difficult thwart competence. In contrast, well-structured environments, skill-challenge balance, and positive performance feedback that is informational promote satisfaction of competence needs. Finally, relatedness refers to having a sense of belongingness and meaningful connection to others. Warm, supportive, and responsive environments rather than cold and neglecting ones facilitate satisfaction of relatedness needs (Ryan and Deci 2000b). According to SDT, all three needs are essential for psychological well-being and growth. Moreover, satisfaction of these needs, especially autonomy and competence needs, play a key role in intrinsic motivation. Basic needs theory has been applied to various domains including education, work, health, close relationships, sports, virtual environments, and digital games. The findings provide strong support for the propositions of the theory (for a review, see Deci and Ryan 2012).

8.2.2.1 Basic Psychological Needs in Games

Modern games with their open worlds, procedural designs, and online multiplayer features provide several opportunities to satisfy basic needs. Autonomy in digital games involves interesting options and volitional engagement (Rigby and Ryan 2011). Although having options is important for autonomy; it is still possible to feel autonomous with limited options. For example, sometimes people do not have any alternatives, but if the only available option is in accord with themselves and if they willingly engage in the activity, they still feel autonomous. Similarly, games with limited choices can still satisfy autonomy needs if it leads the player to volitionally engage in the linear path. Games that satisfy competence needs provide optimal challenges and performance feedback that lead to a sense of efficacy and mastery (Rigby and Ryan 2011). Research suggests that competence might be the most important contributor to enjoyment of games (e.g., Ryan et al. 2006; Przybylski et al. 2009a, b; Tamborini et al. 2010). Relatedness in games is generally considered in the context of multiplayer games, however, single player games with digital

worlds and non-player characters (NPCs) can also facilitate satisfaction of relatedness needs. Games that make the player feel acknowledged and supported by NPCs in the virtual world satisfy relatedness needs (Rigby and Ryan 2011). Next we review the empirical research on need satisfaction in games.

In a pioneering research on this topic, four studies showed that games that satisfy autonomy, competence, and relatedness needs promote intrinsic motivation and well-being (Ryan et al. 2006). In the first study, participants completed the Player Experience of Need Satisfaction (PENS) scale which measures autonomy, competence, relatedness, intuitive game controls, and presence in game play, before and after a 20-min long Super Mario 64 play session. It was found that autonomy and competence were positively associated with enjoyment, immersion, preference for future play, and positive changes in short-term well-being. In the second study, researchers compared user experience of two commercially available games, one of which was a very popular and a high ranking game (Zelda: Ocarina of Time) and the other one had very low rankings (A Bugs Life). After two game sessions, participants found Zelda more enjoyable, immersive, and preferable for future play. More important, participants rated Zelda significantly higher in autonomy and competence scores, which predicted the differences in user experience outcomes. Third study replicated the findings using a multilevel model, thus also accounting for individual differences in players. In the last study, these associations were tested in a survey with massive multiplayer online games (MMOs) players. MMOs provide interactions between the players which can facilitate relatedness needs. Indeed, relatedness—in addition to autonomy and competence—was associated positively with presence, enjoyment, and preference for future play. Similarly, in a series of six studies that included four experiments, Przybylski et al. (2009b) investigated the associations between violent game content, need satisfaction, and player experience outcomes. All of the studies showed that autonomy and competence satisfaction in games were robustly associated with positive player experience outcomes (i.e., enjoyment, value, desire for future play), and violent content explained little or no unique variance after controlling for need satisfaction.

These findings provided strong evidence for the role of basic needs in games; however, it is not possible to draw conclusions about causal effects as none of them manipulated basic needs. Other researchers also manipulated autonomy and competence-supportive features of an exergame in a 2×2 factorial design to examine their effects on user experience outcomes (Peng et al. 2012). In the autonomy supportive condition, players could customize the appearance of their characters and choose how to develop their character's skills, and they had dialogue choices for NPC conversations. In the no-autonomy condition, none of these choices were available. In the competence-supportive condition, the game had dynamic difficulty adjustment, a heroism meter, and achievement badges for performance feedback. In the no-competence condition, none of these features were available. After a 15-minute play session, players reported their enjoyment, intrinsic motivation, self-efficacy for exercising, and their ratings for the game. Results showed that both autonomy supportive and competence supportive features resulted in a better user

experience. Furthermore, need satisfaction mediated the effect of autonomy and competence-supportive game features on player experience outcomes.

These studies suggest that satisfaction of three basic needs is an important element of positive player experience and intrinsic motivation. Games that satisfy autonomy, competence, and relatedness need result in positive player experience outcomes, such as higher levels of enjoyment, immersion, intrinsic motivation, and desire for future play. In the next section, we discuss a few basic game features and their relation to satisfaction of basic needs.

8.2.2.2 Game Features and Basic Psychological Needs

Choice is an essential element of games. In fact, choices are the main interactive elements that differentiate games from other entertainment media. However, games vary in their provision of choices. Some consist of only one screen and involve limited number of choices, whereas others offer huge open worlds with lots of choices. Open world action games or role-playing games, are generally higher in autonomy satisfaction as they provide a lot of freedom to the player in developing their in-game characters, engaging in different activities or quests whenever they want. Research also suggests that providing basic choices such as avatar customization and dialogue choices increases autonomy satisfaction (Peng et al. 2012). Nevertheless, having choices is an important but not a necessary element of autonomy in games. Even if a game provides several choices, the players may still feel controlled if the game forces them to do something they do not want. In contrast, the players may still feel autonomous if the only provided choice is something they endorse. For instance, a linear game with limited number of choices can still satisfy autonomy needs if the game's narrative can create the feeling of volitional engagement in the game's linear path. Rigby and Ryan (2011) give Bioshock as an example. The game constantly tells the player what to do and provides limited choices. However, the heroic narrative makes the player willingly engage in the provided path, and this creates a sense of autonomy. In contrast, meaningless choices or choices that conflict with the game's narrative are not likely to satisfy autonomy needs. For example, Star Wars: Knights of the Old Republic II, provides the players with dark side (evil) and light side (good) choices in dialogues and quests. In one mini quest, an NPC character asks for ticket money; the light side choice is to help; and the dark side choice is to trick the character by taking all the money she has and then not buying her a ticket. The dark side choice—although evil—is incongruent with the dark side player's character, because it turns a highly feared anti-hero into a street con man. The provided options, regardless of their variety, need to be meaningful and in concordance with a player's character or the game's narrative to support autonomy.

Moreover, choices can also have an effect on competence needs. For example, providing an overwhelming number of choices can lead to a chaotic environment, as opposed to a structured one (Katz and Assor 2007). The players may feel intimidated and ineffective because of not knowing what to do. Multiplayer online battle

arena games such as DOTA 2 or League of Legends could provide a good example for the negative effect of overwhelming number of choices on competence. In these team-based multiplayer battle games, new playable characters are being introduced regularly. Currently, there are more than a hundred characters, each with different in-game roles and skill trees, in addition to hundreds of items these characters can equip. Moreover, these games tend to develop a meta-game as the player community figures out the best characters for each role and their skill-item compositions. This intimidates new players, and those who try these games for the first time are likely to feel incompetent. They are put in a chaotic environment, and they do not know what to do or whether they are being effective with their choices. In contrast, for more experienced players, the choices may still feel limited because there are only a few "right" choices. In order to support autonomy and competence, choices provided to the players should be equally viable so that the players can fully endorse their choices without wondering if they are capable of choosing a good one. In fact, research suggests that choice enhances intrinsic motivation if people initially feel competent about the task, and decreases intrinsic motivation if initial perceptions of task competence are low (Patall et al. 2014).

Feedback is another basic element of games. Without feedback, the player will not be able to understand the rules and the structure of game world, how she is performing, or whether the actions have consequences or not. All of these would lead to a low sense of efficacy. Therefore, feedback in games seems to be primarily associated with competence needs. It is also associated with autonomy to some extent, because the action choices may become meaningless without feedback. Indeed, positive verbal feedback in games increases autonomy and competence satisfaction (Burgers et al. 2015). Feedback also provides information about what the player is doing right or wrong, which is essential for developing mastery and competence. For instance, in some First Person Shooter games, there is a change in the shape of the crossbar when the player aims the target correctly. This is likely to increase competence satisfaction as it provides important feedback. Games can also provide positive verbal feedback (e.g., Excellent, Killing Spree, Great) either visually or with an in-game voice for doing certain game actions. However, not all games are well designed and some of them provide vague feedback that can be detrimental to basic needs. For example, pulling a lever in a game only makes a sound (or in the worst case it just moves). The player is left wondering about what happened, whether she is doing something wrong, whether the action has a meaning or not. Sometimes this kind of feedback is used on purpose as a puzzle element. Nevertheless, in most cases vague feedback will have a negative effect on competence and autonomy needs.

A third common element is game difficulty. Difficulty creates the challenge that is essential for satisfaction of competence needs. However, games should provide an optimal level of challenge to satisfy competence needs. Too easy or too difficult games that do not match the skill level of players will lead either to boredom or frustration. Overwhelmingly difficult games are likely to result in feelings of helplessness and a giving up response, an amotivational state in SDT terms. Too easy

games, in contrast, will feel boring and lose the interest of the players. Research also suggests that difficulty balancing is associated with higher levels of competence, which then predicts higher levels of enjoyment (Schmierbach et al. 2014). Similarly, in an experimental study using a multiplayer game with dynamic difficulty adjustment feature, players who were assisted by the game reported higher satisfaction of all three needs if they were unaware of the adjustment. Awareness of the adjustment still increased competence, but reduced autonomy and relatedness (Baldwin et al. 2014). Most modern games aim to provide an optimum level of challenge using features such as manually adjustable difficulty levels, introducing game actions slowly in order not to overwhelm the player, and dynamically adjusting difficulty. Even if a game is difficult, it can still satisfy competence needs if it creates a feeling of self-efficacy (I can do it the next time). However, finding the optimum difficulty could be both tricky and risky for game developers. For instance, Demon's Souls or Dark Souls series are successful games that are also notorious for their difficulty. In these action RPG games, players can die very easily, but the games also give the feeling that it is possible to overcome their challenges. This creates a tremendous sense of competence for persisting players, but many players also give up feeling frustrated.

Although not an in-game element, game controllers are also a big part of the player experience. Traditional controllers (mouse/keyboard or a game controller) will be around in the foreseeable future, but the companies are also experimenting with movement based, or more naturally mapping control methods such as Wii Remote, Microsoft's Kinect, or PlayStation's Move. With the advent of virtual reality technology, it is likely that companies will continue developing alternative controllers. A couple of studies also examined the effect of game controllers (traditional controllers vs. naturally mapped controllers) on basic needs. For example, using a realistic natural mapping controller such as racing wheel lead to highest level of autonomy compared to other controllers (McEwan et al. 2012). However, participants reported highest level of competence when using the traditional Xbox controllers. Similarly, in an experimental study, participants either played a bowling game with a natural mapping controller (Nintendo WiiMote encased in a plastic bowling bowl) or a traditional PlayStation controller. Results showed that natural mapping controller resulted in higher levels of autonomy and competence satisfaction, which in turn predicted game enjoyment (Tamborini et al. 2010).

8.3 Conclusion

In conclusion, SDT provides a concise framework to understand the motivational aspects of gamer psychology. Moreover, it also identifies three basic needs that facilitate fun in games. Game designers should focus on implementing game mechanics that support autonomy, competence, and relatedness needs to enhance the player experience.

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