How Motives Drive Players: Enhancing Digital Games Research with Motivation Psychology

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University of Trier

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Susanne Pöller

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Chapter 1: Introduction

Digital Games

Digital games have become one of the most popular leisure activities and we can illustrate the success of this medium with achieved revenue: PC games alone generated 36.9 billion U.S. dollars in 2020 (Statista, 2021a). Ever since video games first gained popularity in the 1970s, they have constantly evolved and attracted an increasingly higher number of players (Ivory, 2016). In scepticism of the new medium, research first centered around negative outcomes, such as aggression and addiction (e.g., Cooper & Mackie, 1986; Dominick, 1984; Soper & Miller, 1983). In addition to video games being associated with such negative outcomes, identifying as a gamer has frequently been accompanied by stereotypes of the young, male "couch potato" (Kowert, Griffiths, & Oldmeadow, 2012). Despite the negative press, video games have constantly grown in popularity. They are no longer a niche but rather a mainstream activity with 2.7 billion people playing around the globe in 2020 (Statista, 2021c). As a result of this enthusiasm, research has adopted many new directions. Researchers intend to provide explanations for the strong motivational pull that video games can have on their players (Ryan, Rigby, & Przybylski, 2006; Tychsen, Hitchens, & Brolund, 2008), while also aiming to understand what motivates individual players to engage in specific activities within games (Bartle, 1996; Billieux et al., 2013; Yee, 2006).

The Motivational Pull of Games

To understand the attraction of digital games, we have to understand what attracts and motivates human beings to do the things they do in general. The concept of motivation is closely tied to the concept of emotion (e.g., Brandstätter, Schüler, Puca, & Lozo, 2013; McClelland, Atkinson, Clark, & Lowell, 1953). People tend to seek positive emotions (approach motivation) and avoid negative emotions (avoidance motivation) (Elliot & Covington, 2001). Simplistically, we strive to do the things that make us feel good and avoid the things that make us feel bad, which suggests that a basic explanation for the popularity of video games would be that players gain mainly positive emotions. Another possibility would be that they allow us to avoid or forget negative emotions. Researchers have found both of these things to be the case: the concept of *Escapism*, which can be defined as the wish to avoid reality, has been described in connection to digital games (Calleja, 2010). This can be tied to video games being immersive (Irimiás, Mitev, & Michalkó, 2021) and often eliciting a strong flow experience (Larche, Tran, Kruger, Dhaliwal, & Dixon, 2021), which might help players to leave negative emotions and experiences of the reality in the physical world behind. Aside from escaping negative emotions, researchers have found that video games elicit numerous positive experiences. They allow players to make friends and feel closely connected to others who are far away physically (Granic, Lobel, & Engels, 2014; Griffiths et al., 2011). Further, they can arouse feelings of competence and autonomy as well, enabling players to feel like they can master difficult challenges or make their own choices (Rigby & Ryan, 2011). Games are a medium that goes beyond passive entertainment, as gamers can usually make decisions, impact the path and the outcome of games with their actions, and therefore they can feel in control. This allows for them to be proud of the things they achieve in a game and to feel like they can influence what will happen in a way that they can usually not by, for example, watching a movie.

Self Determination Theory

During the last decade, Self-Determination Theory (SDT) has become a powerful tool to explain the motivation for gaming and what types of games are the most popular ones (Ryan et al., 2006). While SDT consists of various mini-theories, one part of the theory has received the most attention in the field of Human-Computer Interaction, which states that all human beings have fundamental needs for *relatedness, autonomy,* and *competence* (Tyack & Mekler, 2020). In general, activities that satisfy these needs are perceived as motivating and will be engaged in more frequently in the future. Researchers have shown that digital games, which fulfill such universal needs are more popular (Ryan et al., 2006) and are associated with longer hours of playing (Johnson, Gardner, & Sweetser, 2016). As a result, game developers have strived to create games that can satisfy these needs effectively, for example by aiming to allow players to feel connected to other players. Multiplayer games are undeniably popular: for example, the Top 10 games on the gaming platform *Steam* (Valve) in January 2021 were all multiplayer games (Statista, 2021b). This indicates that players are indeed enticed by playing together with others. The right amount of challenge and intuitive gameplay systems can ensure that players feel competent in their games, which can be achieved by allowing players to adjust the difficulty levels of a game or by matching them with players of an equal skill level (Sarkar, Williams, Deterding, & Cooper, 2017). To fulfill the need for autonomy, games can be designed in a way that the player feels a sense of control over their actions, for example by creating dynamic storylines that allow players to make their own choices. Applying Self-Determination Theory has allowed game designers to improve the quality of their games by pointing them towards the fundamental motivations (i.e., relatedness, autonomy and competence) that help understand why people engage and continue to play digital games. There are, however, some limitations to this perspective that could be taken into account in future work.

The Concept of Need Satiation

Interestingly, Self-Determination Theory research has mainly been focusing on the concepts of need satisfaction (and sometimes need frustration). However, researchers of motivation have also described the concept of *need satiation*, wherein a healthy human will not be motivated to pursue further fulfilment of a need for a while, if it has recently been satisfied. The concept can be described as analogous to food consumption, where a hungry individual wants to eat and feels satiated after doing so. In this period of satiation, the individual would likely not wish to eat again until eventually the food is digested and hunger returns. In a series of studies, DeWall, Baumeister, & Vohs (2008) find such a pattern for the need to belong. Therefore, which need an individual is currently looking for in the digital world might depend on what they find and do not find in another context. As a result, we might not be looking to fulfil all our needs in a game but rather the needs which are currently missing. Looking at research on SDT can leave the impression that individuals constantly strive to fulfill these needs and do not ever stop. However, following the pattern of need frustration, need satisfaction, and need satiation would mean that a healthy individual would likely play regularly but stop playing for a while once a certain need is satiated (for example once a difficult challenge was finally completed). On the other hand, an individual that cannot satiate a need would keep playing and potentially develop problematic gaming habits. This would be in line with research on satiation in food consumption (Redden & Haws, 2013). Including the rarely studied concept of need satiation in games research, could provide additional insights into the field; however, the lack of attention on this concept is not the only limitation of the current state of research on motivation in games.

The Psychology of Majorities

Another constraint when centering universal needs is that people are being treated as a main effect rather than individually different. This is understandable when assuming that game developers aim to make money. However, when looking at the main effects of need satisfaction there are two main limiting factors: 1) researchers of personality have long argued that needs are not equally strong in

every individual even if they are basic needs that are assumed to be prevalent in all human beings (McClelland, 1987); 2) even if the need is present in every individual and a specific game can satisfy the need for most individuals, this does not guarantee that the strategy is optimal for everyone. Additionally, some players might avoid specific situations in games (e.g., challenging content) that could potentially satisfy needs such as the need for competence because of trait psychological anxiety and the fact that other players might be present to observe their performance (Dechant, Poeller, Johanson, Wiley, & Mandryk, 2020). Therefore, a game might have the potential to fulfil needs but it does not work for everyone because the situation could be daunting to a minority of players and as a result, they might avoid it. Of course, catering to the taste and wishes of the majority is generally more profitable. To take the popular Multiplayer Online Battle Arena (MOBA) game League of Legends as an example, the developers Riot Games are frequently confronted with a loud minority that bemoans that certain champions, out of the currently 154 playable, receive less attention than others. Riot Games releases skins regularly, which are appearance changes for the characters that can be played and which can (most of the time) be bought with money. Naturally, some champions are more popular than others, and creating skins for them is more profitable. These player complaints about their less popular champions not receiving enough skins, recently led Riot Games to state that they indeed prioritize certain champions when making new skins because they are more popular. On the other hand, they still create new appearances for those champions with "small-but-dedicated playerbases" (Riot Games, 2020). While there is nothing wrong with researching majority preferences (main effects) and best solutions for most players, there is a chance that this will frustrate minorities with other motivations that might not share the same preferences (e.g., interaction effects). In other words, when someone does not like a popular game, where other people feel a lot of competence, that does not mean that this person does not wish to feel competent. Maybe, this particular person has trouble feeling competent in the way that the game offers it – or maybe other things are just more important to this person than experiencing competence. This could be because they already experience a lot of competence in other aspects of their life (satiation) but feel lonely and therefore wish to play games to belong to a group.

The Importance of Differential Motivations

Researchers have long noted that not all players can be described in the same way and that there is a multitude of different preferences (Bartle, 1996; Yee, 2006). Players make different choices, which for some games is an important aspect of gameplay. For many multiplayer online games, playing efficiently in a team means that not everyone should pick the same role. When everyone on the team is a dedicated healer, completing game content (such as a dungeon or a raid) could be hard. On the other hand, it can sometimes be difficult for teams to find a healer at all, even if they need one. Of course, such differential player choices do not mean that players cannot fulfil their universal needs through different decisions. One person might feel competent when slaying enemies, while another might experience high levels of competence when keeping their teammates alive. Still, there should be variables of individual motivations behind such choices that help explain individual preferences. Richard Bartle (1996), who created the first widely known player typology for digital games, noted that a healthy game requires a balance of different player types for everyone to be satisfied in the same environment because different player types interact with one another. If there is no adequate balance between different player types in a game, some players feel disinclined to continue playing. This underlines the importance of making a game attractive to different types of players. While some individuals might enjoy playing with likeminded players (e.g., players who wish to make many friends in the game and look for positive social interactions), others might not enjoy being surrounded by only people with similar motivations because it could make achieving their own goals difficult (e.g., players who want to complete the most difficult achievements to feel superior to others, or people who wish to be the leader of a large group of other players).

Applying More Theories to The Field to Broaden Our Understanding

Player Typologies

After Bartle's model, many more player typologies that describe different playstyles emerged over time. A prominent example is Nick Yee's (Yee, 2006) model of player motivations in Multiplayer Online Role-Playing Games (MMORPGs), where he distinguished 10 motivations including, for example, *Escapism*, *Discovery,* and *Socializing*. Player typologies are often developed by observing what potentially different types of players are in a game and then developing several questionnaire items, asking such players to self-report their behaviours and preferences. This is usually followed by a number of factor analyses to sort these items into distinctive categories to identify independent factors. This is a valid methodology, which likely results in reliable measures of players' self-reported behavioural preferences. However, these resulting player types are very specific and could potentially be the outcome of different underlying motivations. They might describe enactment styles rather than an underlying drive. If these measures were not mainly assessing introspective self-reports, they could remind one of the psychological movement *behaviorism*, where inner mechanisms (causes, states, events) are not considered relevant and can be neglected in favour of behavioural outcomes (Moore, 2011). To put it in a nutshell: describing an outcome such as a player type is a valid approach when aiming to categorize players but inferring from there to an inner motivational state does not fit the idea of what motivation is: the inner driving force – the reason why people do what they do. While a player typology that does not validate the inner processes of how motivation leads to emotion and behaviour likely adds more descriptive than explanatory value, that does not mean that such typologies or measures did not help the field advance. They identify behavioural clusters and categories of interest; they point game developers towards features that are differentially appealing to different player types; they also help researchers find a common terminology to describe play styles and player types to understand them better. However, for identifying underlying driving forces, they are likely not a suitable approach. Such typologies (e.g., Bartle, 1996; De Grove, Cauberghe, & Van Looy, 2014; Kahn et al., 2015; Nacke, Bateman, & Mandryk, 2014; Tondello et al., 2016; Yee, 2006, 2015) seem to follow the assumption that the activity is done for the sake of the activity – which could be true but is not proven. Simply because people do something does not mean they enjoy the activity. They might simply do it for a specific result which they hope to enjoy later. In short: what people do is not the same as why they do it. Therefore, a validation process is needed as to what motivates different people and why, rather than simply describing the outcome and concluding that our observations are the same as why we observe them. A broader understanding of the concept of motivation is needed to develop adequate models of player motivation.

The Historical Context of Motive Dispositions

Theories of individual motivations do not have to be invented from scratch; they already exist. *Motive Disposition Theory* is the most researched example. Dan P. McAdams (1988) described *motives* as a *personality disposition for the individual that "speaks to the question of 'why' in human behavior and experience" and "serves to energize, direct, and select behavior and experience within the context of constraints and opportunities afforded by the environment".* Historically, motive research centered around unconscious or *operant* motivations measured with fantasy stories instead of self-report questionnaires. The first list along with a method of measuring a variety of such motives (the *Thematic Apperception Test*) was provided by Henry Murray in the 1930s (Murray, 1938). Other researchers followed up on Murray's assumptions and aimed to identify the key motives among his needs, also refining the measurement method, resulting in the *Big Three* motives of Affiliation, Achievement, and Power (McClelland, 1987). Since then, researchers have described other key motives, including but not limited to Autonomy (Alsleben & Kuhl, 2011; Baum & Baumann, 2021; Schüler, Sheldon, Prentice, & Halusic, 2016). The name "Motive Disposition Theory" is relatively new to the field and has been increasingly used since Sheldon & Schüler (2011). Motive Disposition Theory refers to McClelland's

theory that has more often been referred to as 'Human Motivation Theory', 'Need Theory', 'Three Needs Theory', 'Learned Needs Theory' or 'Acquired Needs Motivation Theory'. David C. McClelland (McClelland, 1985, 1987; McClelland, Koestner, & Weinberger, 1989) built it by expanding on the need theory of Henry Murray, which had been labeled *'Personology'* (but McClelland has not used this name for his theory). However, all of these commonly used theory names are too broad in today's context since multiple theories adopted the concept of needs. Many papers on motive dispositions do not mention a theory name at all and simply refer to the motive they center around, which can make it difficult to find the appropriate literature of the researchers that based their work on McClelland's framework. This is a clear shortcoming of the theory, that can make it difficult to find the numerous published research papers that rely on McClelland's theory but we can aim to correct it in the future by using a common and distinct name to refer to it. I have adopted the name Motive Disposition Theory, which has been used several times over the last decade (e.g., Dufner, Arslan, Hagemeyer, Schönbrodt, & Denissen, 2015; Schüler, Brandstätter, & Sheldon, 2013; Sheldon & Schüler, 2011). To highlight the importance of the theory in the field of psychology: David C. McClelland has been ranked as number 15 on the list of the 'most eminent psychologists of the 20th century (Haggbloom et al., 2002), even ranking higher (number 10) when it comes to the researchers that had been most frequently cited in introductory psychology textbooks.

Implicit Motives: Needs

Motives emerged during a time when the unconscious was a focus of research in psychology. Inspired by the works of Sigmund Freud and Carl Jung, it was natural that when researchers looked for the underlying forces (motivations) of behaviour, they were not looking at conscious self-descriptions (as these became popular later in time). Rather, these researchers focused on what was revealed by the direction of attention, thoughts, and the choice of words that people used to describe a situation. When Henry Murray described needs in 1938, he did not distinguish between implicit and explicit needs. These distinctions emerged much later. He identified basic needs, including but not limited to Achievement, Affiliation, and Power, arguing that there are interindividual differences in need strength (Murray, 1938). In this regard, Murray acknowledged both the universality of needs, mostly adopted and represented today by researchers applying Self-Determination Theory, as well as interindividual differences in need strength, applied and represented by researchers who employ Motive Disposition Theory. Together with Christiana Morgan, Henry Murray developed the Thematic Apperception Test, the first measure of what we call implicit motives today (Morgan & Murray, 1935; Murray, 1943).

Explicit Motives: Self-attributed Needs

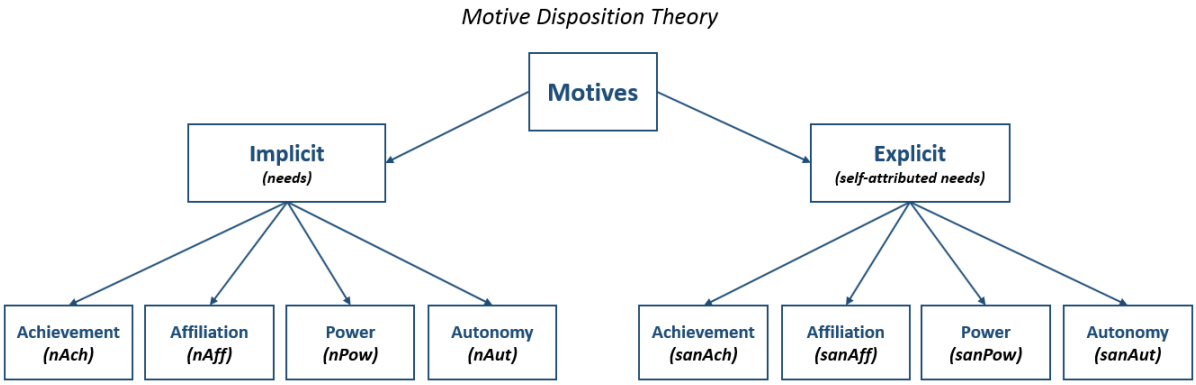
Explicit Motives gained importance with the Cognitive Revolution when the trend in experimental psychology started to shift from a behavioural perspective towards theories involving the mind. Psychologists started to not only look at what people do but also at what people think, feel, and how they perceive (Miller, 2003). In this context, questionnaires and self-descriptions became more popular. At the beginning of motivational research, explicit motives were referred to as *values* (DeCharms, Morrison, Reitman, & McClelland, 1955). This term was later abandoned by McClelland, Koestner, and Weinberger (1989) since it had also been used to describe normative goals and beliefs (Rockeach, 1973) since the 1970ies.

When this increasing interest in self-report measurements emerged, researchers tried to develop questionnaires to measure motives instead of using the traditional picture stories. It did not take long for these researchers to realize that these two measures hardly correlated. As a result, McClelland et al. (1989) proposed the distinction between explicit and implicit motives and declared them different constructs that can be used together for a better understanding of human beings. He compared the behavioural predictions that had been made with the different measurement methods and concluded that explicit motives predict *respondent* and short-term behaviour. He labelled them *self-attributed*

needs (*san*), a term that describes that they are measured by self-report and how they are based on individuals' reflections on their motives in contrast to the term *needs* (*n*) that he used to label implicit motives. This labelling illustrates the understanding of many motive researchers that implicit motives represent the actual need that has traditionally been the center of motive research. Therefore, self-attributed needs (or explicit motives) could be described as an obstacle in the way of people understanding what they actually need. This view seems to reflect the literature on motives, where explicit motives are generally used as a comparison or to establish the importance of congruence between explicit and implicit motives (people recognizing their own needs). This perspective is apparent when looking at the literature suggesting that motive congruence could be taught to improve well-being (Baumann, Kaschel, & Kuhl, 2005; Brunstein, Schultheiss, & Grässman, 1998; Hofer, Busch, Bond, Li, & Law, 2010) and that – for example – an implicit affiliation motive does not lead to relatedness satisfaction without a corresponding explicit affiliation motive or affiliation behaviour (Schüler, Job, Fröhlich, & Brandstätter, 2008). As a result, it can be concluded that explicit motives are well defined but have not received as much attention as implicit motives. They seldomly have been focused on in research questions since the first explicit motive questionnaires emerged, which at that time were still aiming to replace the measurement of (implicit) motives rather than establishing a new construct. Therefore, for a while, some researchers treated self-report and fantasy-based methods as alternative measurements of the same construct (Borislow, 1958; Campbell & Fiske, 1959; Hermans, 1970). The cognitive revolution had also led to a preference for self-report measures. Projective tests like those measuring implicit motives were perceived as less reliable due to low internal consistency estimates (Entwisle, 1972; Lilienfeld, Wood, & Garb, 2000), inferior to questionnaires (Pruitt, Smith, Thelen, & Lubin, 1985; Thelen, Varble, & Johnson, 1968), and too time-consuming (for participants to write and for two raters to code each story). However, since researchers argued that implicit and explicit motives represent distinct constructs (McClelland et al., 1989), ignoring implicit motives did not seem reasonable either, especially when considering their predictive power (Spangler, 1992). As a response to the controversy, supporters of projective measures have shown that projective tests have satisfying reliability scores when properly administered and coded (Lundy, 1985; Schultheiss, Liening, & Schad, 2008; Schultheiss & Pang, 2007; Winter & Stewart, 1977) and when estimating reliability with appropriate response theory models (Lang, 2014; Runge et al., 2016). Furthermore, projective tests are less biased by social desirability and 'faking' than questionnaires (Bornstein, Rossner, Hill, & Stepanian, 1994; Meyer & Kurtz, 2006). To summarize, implicit motives have been established as being well suited to explain behavioural outcomes but obviously how a person self-describes their preferences and motivations cannot be neglected either as it also influences what people will do and what choices they make.

Figure A

An overview of the constructs of Motive Disposition Theory as understood in this work.



Explaining the Why of Behavioural Outcomes in Games

Behaviour

Psychology is defined as the study of mind and behaviour. Yet, at the current state of psychological research, behaviour is rarely still measured, unless it is self-reported past, future, or hypothetical behaviour (Baumeister, Vohs, & Funder, 2007). However, there is no guarantee that participants report the actual behaviour that they would show if they were to find themselves in the situation. As an example from the video game context, this could mean that in a study, we describe a hypothetical scenario of a person that needs help. The participants should then predict whether or not they would help this person in need. Whether such a self-report is indicative of actual helping behaviour would likely depend on the current emotions and stress level of the player that was asked for help as well as the context, whether the player can provide help and how much the player likes the person who needs help. Therefore, the actual behaviour might differ depending on the specific properties of the situation and participants might not always be able to accurately predict their actions. In this work, I and my co-authors aimed to conduct studies that measure behaviour or at the least ask participants to report on preferences for behaviours within digital games that they engage in regularly.

Preferences

When using the word *preferences* (as opposed to the term 'affective preferences' that we later use to describe implicit motives), we are mainly looking at self-reported behavioural preferences of participants (or in other words what they say they like to be doing when there are alternative choices in a game). When we talk about such preferences, there is no inherent understanding of how exactly they were shaped or why participants report them. Research in Psychology notes the concept of *self-infiltration*, which can be described as the phenomenon that people misattribute social expectations, recommendations, or assignments as self-selected goals (Kazén, Baumann, & Kuhl, 2003). Personality factors such as *state orientation* (a persistent negative emotional state after being exposed to negative events) have been found to influence the likelihood of a person being subject to self-infiltration (Kazén et al., 2003). Additionally, *motive-incongruency* is another phenomenon that describes diverging explicit and implicit motives within a person. An example would be someone who describes themselves as a sociable person (high explicit affiliation motive) but does not get high levels of enjoyment out of social interactions (low implicit affiliation motive). In this case, a person would describe a preference that is not optimal for their well-being (Schüler et al., 2008), and is therefore likely to engage in behaviours that do not make them happy. A suitable example from the context of digital games might be that women who play Massively Multiplayer Online Role-Playing Games (MMORPGs) are more likely to choose to play a healer if they are more experienced with MMORPGs as compared to inexperienced women (Bergstrom, Jenson, & De Castell, 2012). This gendered preference seems to become stronger over time, which could be the result of women adjusting their preferences to social norms and expectations within the game rather than what seemed appealing to them initially. On the other hand, self-reported preferences are not always problematic or contrary to what makes a person happy. Some individuals might be influenced mainly by what brings them joy and less by what is socially desirable when describing their preferences. Therefore, our understanding of a preference is what a player thinks they like regardless of why they have this belief.

Choices

While we treat preferences as self-descriptions, making a choice requires an active decision between existing alternatives in the context of a study. This means that when we report on choices, participants have to make a selection from a list of options that would typically occur within a game, even if they are not actually playing the game during the study. The choices in the context of our study (chapter 4) will be about the appearances of digital companion characters, which are supposed to be made spontaneously. We ask participants to base them on a given context without providing further

information about the companions to the participants beyond what they look like. Motives are assumed to orient, select and energize behaviour (McClelland, 1987). The orienting and selective functions are of particular importance in this context. Motives should draw attention to perceptional cues that provide an incentive for a specific motive (i.e., orienting function). Then the player should select the option that leads to the anticipation of the best possible emotional outcome (i.e., selective function). This emotional anticipation should depend on personal motives and motive-related memories from experiences in similar situations. In this work, we ask participants to make a choice based on the appearance of a digital companion (Pokémon). We expected power-motivated individuals to focus their attention and choices on strong-looking Pokémon rather than cute Pokémon as strength is a cue relevant to the power motive.

Experiential Outcomes

As was mentioned earlier, motivation is strongly tied to emotion. People develop habits and preferences, showing similar behaviours repeatedly rather than just once. If a behaviour is not repeated then either there might be situational constraints that prevent it, or the experiential outcome of the behaviour was not entirely pleasant. Generally, individuals tend to seek positive experiences (approach motivation) and avoid negative emotions (avoidance motivation) (Elliot & Covington, 2001). Therefore, some motivational theories focus on desirable experiential outcomes of behaviour and define these as a source of subsequent motivation. Self-Determination Theory (Deci & Ryan, 2000) and Flow Theory (Csikszentmihalyi, 1990) are examples that focus on identifying situations that provide positive experiences for the majority of people. In such theories, the experience becomes an end in itself and the behaviour is assumed to be repeated because it brought about positive experiences in the past. To explain differing experiences, these theories alone do not provide us with much information as the causes of differential motivations are not and have never been in their focus. Usually, researchers working with these theories do not measure the need – they measure the satisfaction of a need that is assumed. Essentially, when participants report higher need satisfaction in situations that they seek out repeatedly, it is inferred that therefore the need exists. As a result, when aiming to understand individual experiences, researchers have turned to other theories of motivation, including Motive Disposition Theory, and used them in combination with motivational theories that are based on experience (e.g., Self-Determination Theory and Flow Theory) (Schüler, Baumann, Chasiotis, Bender, & Baum, 2019; Schüler et al., 2013; Sheldon & Schüler, 2011). I strongly agree that the quality of experiences that players make in the game will influence their future behaviour and argue that individual motives alter such experiential outcomes and are therefore relevant when understanding differential player experiences.

Explicit Motives in the Specific Context of Games

It has been theorized by David McClelland that explicit motives are context-sensitive or could even help to understand in which context an implicit motive unfolds (McClelland et al., 1989). This assumption has hardly been tested in experimental research, as motive researchers had little focus on understanding explicit motives. However, the assumption seems theoretically plausible since explicit motives are influenced by social desirability. When it comes to social motives it is possible that, for example, when people think of themselves as sociable, this might not apply to every context. A person might wish to form relationships with friends at school or a sports club but possibly not in an online context without physical interaction. Reasons for such context discrepancies could be that generally online contexts are seen as anonymous (Wallace, 2008) where players are presumed to hide their true identity. Some researchers have even suggested that online friendships are generally inferior to offline friendships (Fröding & Peterson, 2012). Though other researchers have also emphasized the importance and quality of friendships in the digital world (Barnett & Coulson, 2010; Bülow & Felix, 2016; Depping, Johanson, & Mandryk, 2018; Domahidi, Festl, & Quandt, 2014), it is still possible that some players seek friendships in the physical but not in the digital world. In this case, we would say

that they have a high explicit affiliation motive in the physical world but not in the context of digital games and therefore, the context that the explicit motive is researched in matters. The studies that I designed have paid respect to the context of digital games they have been conducted in, whenever working with explicit motives. When working with implicit motives there was no theoretical reason to measure them differently in a game's context and thus established measures have been used.

Research Goals

To summarize, the goal of the research that will be showcased in this work is to translate a theory of motivation (i.e., Motive Disposition Theory) into the interdisciplinary context of digital games research and provide an overview of its assumptions, which is relatively easy to understand and work with, even without a professional background in psychology. With the help of four research papers that describe seven different studies (total N = 1197), I aim to provide examples of the opportunities and challenges of working with implicit and explicit motives in digital games research to understand individual players better. One focus was to make sure that each construct is applied with respect to the assumptions of the theory. Meaning that when the focus is on implicit motives, operant behaviour is measured, while when the focus is on explicit motives, we measure self-reported preferences and choices in structured situations with a social incentive present (respondent behaviour). I want to stress that the goal of this work is not to promote a theory that can explain every type of behaviour in every situation but can provide a valuable contribution to those aspects of digital games research that the currently used theories have trouble explaining.

Outlook

The next chapters will present four research papers that apply Motive Disposition Theory in the context of digital games. The constructs of explicit and implicit motives will be explained in detail and the focus will be on the two social motives (i.e., affiliation and power). As dependent variables, we will present behaviour, preferences, choices, and experiences in different game environments. The four papers will be followed by a general discussion and an outlook on researching player motivations in digital games.

All references of Chapter 1 (Introduction) and Chapter 6 (General Discussion) will be listed together in the end of the thesis.

Chapter 2:

Let Me Be Implicit: Using Motive Disposition Theory to Predict and Explain Behaviour in Digital Games

(Poeller, S., Birk, M., Baumann, N., & Mandryk, R. L. 2018)

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Let Me Be Implicit: Using Motive Disposition Theory to Predict and Explain Behaviour in Digital Games

Susanne Poeller[1], Max V. Birk[2], Nicola Baumann[1], Regan L. Mandryk[2]

[1]Department of Psychology,
University of Trier
Trier, RLP, Germany
{s1supoel, nicola.baumann}@uni-trier.de

[2]Department of Computer Science,
University of Saskatchewan
Saskatoon, SK, Canada
{firstname.lastname}@usask.ca

ABSTRACT

We introduce explicit and implicit motives (i.e., achievement, affiliation, power, autonomy) into player experience research and situate them in existing theories of player motivation, personality, playstyle, and experience. Additionally, we conducted an experiment with 109 players in a social play situation and show that: 1. As expected, there are several correlations of playstyle, personality, and motivation with explicit motives, but few with implicit motives; 2. The implicit affiliation motive predicts in-game social behaviour; and 3. The implicit affiliation motive adds significant variance to explain regression models of in-game social behaviours even when we control for social aspects of personality, the explicit affiliation motive, self-esteem, and social player traits. Our results support that implicit motives explain additional variance because they access needs that are experienced affectively and pre-consciously, and not through cognitive interpretation necessary for explicit expression and communication, as is the case in any approaches that use self-report.

Author Keywords

Motive disposition theory; digital games; player types; implicit motives; explicit motives.

ACM Classification Keywords

K.8.0 [Personal Computing]: General - Games.

INTRODUCTION

In player experience (pX) research, we are interested in describing what players enjoy and predicting what choices they will make. For example, what attracts players to different games in the first place? What explains churn – why do some players move away from a game whereas others stay committed? What are the different play styles and how can we scaffold a tailored experience in a game with myriad mechanics and possible approaches toward play?

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There are many theories that explain aspects of pX and predict behaviour (e.g., flow [98], satisfaction of needs [82], immersion [18,53]); however, they don't incorporate the known differences between people in terms of their personalities (e.g., [27,71]), motivations for play (e.g., [45,106]), self-concepts (e.g., [48,81]), or play styles (e.g., [7,75]). And we know that people are different: they play different games, make different in-game choices, and enjoy different game features. For example, what satisfies one person's need for competence – such as finishing a level – might not satisfy another's – such as a person who needs to finish that level with 3 stars to experience competence. Or consider that two players may need different amounts of arousing game features to enjoy playing [11]. How can researchers begin to characterize the differences in people that drive in-game behaviour and result in differing experiences?

Many attempts have been made to describe individual differences in the context of play either through statistical models of how traits affect experience directly (e.g., [41,54,55]), or moderate the translation of in-game experience into enjoyment (e.g., [14]); however, they all rely on explicit measures of personality (e.g., [27,79]), play style (e.g., [75]), or motivation for play (e.g., [45]). Self-report methods are valuable because they reflect how individuals consciously describe themselves and what they think they enjoy, they explain how we cognitively evaluate our experiences, and they predict short-term behaviours, especially in contexts where social influences are present [19,70,97]. However, they are not reliable predictors of long-term behaviours and spontaneous behaviours [70], or volitional activities undertaken outside of a context of social incentives [19,70], which are important for explaining our perceptions, actions, choices, and persistent behaviours when interacting with the physical world [91].

To describe what actually pleases us, rather than what we rationally think that we want, we can turn to *affective preferences.* Affective preferences [20,69] are the *incentives that someone enjoys and actively seeks out*. They are unconscious drivers of behaviour based on experienced positive affect, established early in life [70], assumed to be stable over the lifespan [93], and predict long-term behaviour [70,104]. They describe why people behave differently in – and get

different value from – similar experiences [57,84,105]. Because of their explanatory value, affective preferences could help researchers explain play behaviour and understand play experiences. However, because people aren't generally consciously aware of their own affective preferences [57,70,90], when we ask players about them – as is common in pX research – we do not actually access their implicit affective preferences, but rather their *explicit conscious preferences* [57,70]. We determine how individuals consciously describe themselves (e.g., 'I enjoy being surrounded by other people', 'I am happy with what I have achieved so far') – as people respond using cognitively elaborated answers [44,56] given in a context of social desirability [42,73] – rather than being capable of directly accessing what provides them pleasure [105] and drives their behaviour [104].

In this paper, we present *Motive Disposition Theory (MDT)* [67] as a framework to explain individual differences in behaviour and experience in digital games. MDT describes three motives (achievement [4], affiliation [17], and power [65,102]), with an additional fourth motive (autonomy) [2,3] under validation. Motives overlap with existing models of player motivations [45,106] and preferred play style [75]; however, one important distinction with other trait approaches is that there are tools to assess both explicit conscious preferences, i.e., *explicit motives* [52,60,83], and implicit affective preferences, i.e., *implicit motives* [62,93, 103], which presently cannot be accessed through any form of self-report [70,86,97]. Another difference is that motives offer depth by differing in their orientation between approach and avoidance [34] – such as hoping for success versus fearing failure, hoping for social closeness versus fearing rejection, or hoping for power versus fearing weakness [62].

We first describe the theory, provide examples of how it relates to play experiences, and contextualize its potential for understanding players in relation to current theories of player personality (i.e., Big Five model [27,71], self-esteem [81]), motivation (i.e., Digital Games Motivation Scale (DGMS) [45], BrainHex [75], Quantric Foundry [107]) and experience (i.e., intrinsic motivation [30,31], need satisfaction [82], flow theory [28]). We then describe a study, designed to investigate the affiliation motive in social play; 109 participants played Minecraft (Mojang, 2009) in groups of 3 for 30 minutes with the sole instruction to 'build a house'.

Our results show three contributions: First, that most explicit motives correlate with measures of player style and experience, but that implicit motives do not as they access more embodied structures of affective experiences, rather than consciously rationalized ones. Second, we show that implicit affiliation predicts social behaviour in the game in terms of the types of chat messages exchanged and likeability ratings for other players. Third, we show that implicit affiliation adds significant variance to explain these social behaviours even when we control for social aspects of personality (Extraversion and Agreeableness), explicit affiliation (approach and avoidance), self-esteem, and social player traits (DGMS Social and BrainHex Socializer). Together, these results reinforce the idea that implicit motives explain additional variance because they access needs that are experienced affectively and pre-consciously, and not through cognitive rationalization to be explicitly expressed and communicated, as is necessary in any approaches that use self-report.

Our work introduces motives into player experience research, contrasts them with existing approaches, and demonstrates that implicit affiliation explains significant variance in behaviour over and above explicitly-accessed social constructs. Implicit motives bring a valuable new perspective and method that can help us better understand players, and what drives them to behave in the ways that they do.

A PRIMER ON MOTIVE DISPOSITION THEORY

We introduce motives, the interplay between implicit and explicit motives, and approach and avoidance motivations.

Motives

In order to understand how and why players behave differently within games, we have to understand the motives (i.e., desired end-states) that drive their behaviour. These can either be consciously-described goals that individuals attribute to themselves (i.e., explicit motives), or unconscious affective preferences for certain types of incentives inherent in activities (i.e., implicit motives). These two types of motives rarely correlate with each other [22,29,50,69], but can interact with one another in various ways.

Traditionally, three motives were identified. The *affiliation* motive is the desire to form meaningful and satisfying relationships or not be rejected and alone. The *achievement* motive is a preference for activities that increase an individual's performance. The *power* motive is the need to impress, control and influence others, and to receive recognition for doing so [64,91]. A fourth motive – the *autonomy* motive – was recently identified and described as the need for self-preservation by establishing and protecting boundaries between the self and others through self-integration, self-expansion, and self-protection [2,3]. It describes the need to have control over oneself rather than allowing others to do so [88]. Research validating the autonomy motive is ongoing.

A central postulate about motives is that they orient, select and energize behaviour [68]. In other words, they influence what options for action we see, choose, and persevere toward. As established by McClelland [66], implicit motives predict *operant* behaviour, that is, spontaneous behaviour and behavioural trends over time. They are aroused by affective, task-related incentives that promise rewarding emotions. Explicit motives, on the other hand, predict *respondent* behaviour, that is, immediate responses in structured situations, often based on cognitively elaborated decisions [66,68]. Explicit motives are aroused by rational, social-evaluative incentives, and influence how individuals consciously describe themselves (e.g., 'I like helping other people').

Explicit Motives

The more commonly used and known type of motives are the conscious explicit motives. McClelland et al. [70] labelled

them *self-attributed needs* (often referred to in literature as *san*Aff, *san*Ach, and *san*Pow for affiliation, achievement and power, respectively); however, they are now most commonly referred to as *explicit motives*. Explicit motives are assessed by self-reports through questionnaires and work particularly well in predicting behaviour when assessed shortly before the behavioural measurement and in a similar context [1]. However, the problem with explicit motives is that they predict behaviour only in a restricted range of contexts, especially in highly structured situations in which a social incentive is present. To illustrate, Brunstein and Maier [19] showed that individuals high in explicit achievement were more likely to keep working on a mental concentration task after normative feedback (i.e., social-relative phrasing, such as "you performed worse than others") but not after self-referenced feedback (i.e., individual-relative phrasing, such as "you performed worse than previously"). This finding demonstrates how social incentives (i.e., outperforming others) are more important for the explicit achievement motive than task-inherent incentives (i.e., improving own skills).

Explicit motives are developed in later phases in life and are related to cognitive areas, such as the cerebral cortex [70]. They drive respondent behaviour, e.g., the choice to engage in a competition because of an individual's self-concept that he or she is a competitive person. Similar to New Year's resolutions, these attributions as to what is important for the self are not necessarily connected to what a person *actually* enjoys and will continue to choose to engage in over time. As such, explicit motives often do not predict long-term behaviour [70], and if people do pursue explicit goals that do not meet implicit needs it often results in exhaustion [58], especially when social incentives are not present.

A number of explicit motive questionnaires have been developed within the last seventy years, e.g., the Personality Research Form [52], the Motive Enactment Test [60], and the Unified Motives Scales [83].

Implicit Motives

Implicit motives are unconscious motives, so the person is usually not aware of these affective preferences. They are also referred to as *needs* (e.g., literature will use, for example, *n*Ach for the need to achieve) [70]. Implicit motives are measured with projective techniques like the Thematic Apperception Test (TAT), in which participants write stories to a set of ambiguous pictures that are analyzed according to a complex coding system [74]. The idea underlying these projective techniques is that individuals perceive and interpret their surroundings in need-related ways; recurrent themes that emerge reflect the participant's underlying motives.

Implicit motives are assumed to develop very early, in preverbal phases in life and have a close connection to affective experiences in infancy and early childhood [70]. They predict hormonal reactions; for example, the implicit power motive predicted testosterone increases in males after winning a dominance contest and cortisol increases after losing [89]. The affiliation motive has been linked to enhanced immune system functioning and progesterone release [46].

Implicit motives do not reflect conscious opinions about the usefulness or value of a behaviour but affective preferences, that is, the type of incentives someone enjoys and actively seeks out [70]. Therefore, implicit motives predict long-term behavioural patterns that can unfold in various ways and situations rather than concrete goals in specific domains. For example, a high achievement motive could lead to higher effort in painting, writing, sports, or video game play depending on the person's explicit goals, but the implicit achievement motive is always characterized by the unconscious need to do something well, regardless of the specific domain in which it is expressed. Achievement motivated people tend to be more persistent and successful in what they choose to do because they enjoy experiencing competence itself [92].

Common implicit motive measures are the Picture Story Exercise (PSE; [74,93]) and the Operant Motive Test (OMT; [62]), which are both based on the previously-described TAT and are projective measures. Semi-projective measures to assess implicit motives include the Multi-Motive Grid (MMG; [96]), in which participants have to select one or more of several given answers that describe the situation in each picture best. To date, however, the Operant Motive Test is the only method that measures all four implicit motives (including autonomy) within a single coding system.

Based on the theory and the long history of implicit motive research, we expect implicit motives to offer valuable insights into in-game behaviour, especially spontaneous choices and long-term trends. To the knowledge of the authors, there have been almost no attempts to study the connection between implicit motives and video game behaviour. One study used the MMG to assess implicit motives [101] and showed that the implicit achievement motive was negatively related to interest in playing digital games; however, it was published in 1995 and digital game technology and presence in society has changed drastically in the interim.

How Do Implicit and Explicit Motives Relate?

Although explicit and implicit motives access different preferences (cognitive or affective), their synthesis can lead to a more complete understanding of behaviour and experiences. First, high congruence between implicit and explicit motives leads to more flow [84] or well-being [20,49], as congruence indicates that an individual consciously engages in behaviour that corresponds well with unconscious needs, leading to a positive affective outcome. Second, implicit and explicit motives can cooperate in strengthening behaviour [70] or create a conflict by blocking each other and as a consequence reduce well-being [9]. For example, an individual high in implicit affiliation (i.e., gets pleasure from being close to others) but low in explicit affiliation (i.e., is not aware of this affective preference) will not seek to spend time with others, even though doing so would have a positive outcome [87].

Although they share nomenclature, implicit and explicit motives are different constructs, and multiple attempts to combine them into a single instrument that shows correlation [32,47] has failed [97].

Approach and Avoidance Motivation

Both implicit and explicit motives can be pursued with two types of motivational orientation: hope of need satisfaction (approach motivation) versus fear of need frustration (avoidance motivation) [36,38]. Both approach and avoidance can serve as strong motivators for behaviour. For the affiliation motive, *hope for closeness* (approach) entails liking and enjoying intimacy or spending time with others, whereas *fear of rejection* (avoidance) is the wish to be not alone [37,43]. For the achievement motive, *hope for success* (approach) entails the enjoyment of a challenge, whereas *fear of failure* (avoidance) focuses on not doing badly [6,33,35]. For the power motive, *hope of power* (approach) entails finding pleasure in helping, leading, or influencing others, whereas *fear of weakness* (avoidance) focuses on having a higher status than others or having power over them in order to avoid being dominated or powerless [59,102]. Finally, for the autonomy motive, *hope of self-integration* (approach) is associated with feelings of pride, self-worth, and enjoyment of self-experiences, whereas *fear of self-devaluation* (avoidance) is the wish to avoid feeling insecure about the self, ashamed, and unworthy [2,62]. Motive assessment techniques differ in the extent to which they allow differentiation between approach and avoidance motivations [85]. For example, the most common coding system for the Picture Story Exercise [103] does not differentiate between hope and fear components, but integrates them into a single score for each motive, whereas the Operant Motive Test (OMT) can differentiate up to five different strategies (S1-S5; 1. self-motivation, 2. positive incentive, 3. self-regulation, 4. active avoidance, and 5. passive avoidance) for enacting each of the four motives [10,62].

CONNECTING MDT TO PX RESEARCH APPROACHES

As described in the previous section, motives represent our cognitive and affective preferences, which explicate what drives our short-term choices and long-term behaviours. Exploring player motivations, choices, behaviours, and experiences has also been a central goal of pX research, thus there is overlap between game-specific approaches to understanding motivations, experiences, and constructs in MDT.

Connection to Self-Determination Theory (SDT)

Self-Determination Theory (SDT) [31] is one of the most prevalent theories used in pX research [80,82]. MDT [67] defines motives as learned needs, and focuses on individual differences in the strength of these needs as driving forces for behaviour, whereas SDT defines needs as innate, and focuses on their universal importance for psychological functioning and well-being. The fundamental needs described in SDT are *relatedness*, *competence,* and *autonomy*, suggesting that the need for power is less fundamental and not collectively shared by all human beings, although some aspects of the power motive are included in the need for relatedness. Because satisfaction of the basic needs is assumed to be equally beneficial for everyone, SDT researchers do not measure individual differences in the strength of needs but the amount of need satisfaction as predictors of well-being. The differences in the definitions, research topics, and measurement approaches might lead to the conclusion that the theories are not compatible. However, Sheldon and Schüler [95] show that both provide valuable insights and can be integrated into a coherent framework (see also [85]); for example, that the effects of need satisfaction are universal when predicting general outcomes, but are moderated by implicit motives when predicting domain-specific outcomes.

In the context of pX, SDT effectively describes why a play experience is preferred, but MDT will incorporate individual differences into that preference. For example, SDT may explain why a game is enjoyable, but not why one player finds it enjoyable and another does not. To address individual differences when using SDT to explain pX, researchers have generally turned to individual traits as moderating variables.

Relationship of MDT with Trait Differences

To explain individual differences in pX, researchers focus on differences in player personality, motivation, or playstyle.

Personality and Self-Esteem

Personality has been often employed to understand differences between players in pX research; personality is usually characterized using the Big Five factor model [27,71], although other aspects of personality, such as self-esteem [14,81] or self-discrepancy [13,48,78] have also been explored in pX research. In some cases, personality has been shown to connect with game preference, for example with a preference for violent games [23], problematic game play [25], appropriate in-game behaviours [72], and inclination toward evil characters [100]. Personality factors have also been associated with preferred genres [77], presence in games [54], and as a moderator of experienced need satisfaction in games [14]. However, personality has been a weak or unsuccessful predictor of the number of hours spent playing mobile games [94], of choice in character role, class or race [12], of game preferences [76], or of in-game experiences [8,99,108].

Explicit motives show significant but moderate overlap with the five factors of personality [40]: In a factor analysis that include both the five factors and explicit motive measures, the affiliation motive loaded on a common factor with Extraversion, the achievement motive with Conscientiousness, and the power motive with low Agreeableness. In contrast, Neuroticism loaded on a common factor with the avoidance dimensions across motives whereas Openness to experience emerged as a separate factor [40]. However, the five factors do not show correlations to implicit motive measures [90].

Player Motivations and Playstyle

Personality, as described by the five-factor model, has not been shown to be consistent in predicting player experiences, and some researchers have concluded that “games studies re-

quire innovation in research methods rather than the application of received theories, constructs and models to the context of games and play" [8]. In response, several game-specific approaches to measuring player style or motivation have been proposed and created. Bartle's Test of Gamer Psychology suggested four player classes: Killer, Achiever, Socializer, and Explorer [7]. The BrainHex approach [75] divides players into seven types based on the intended neurobiological experience: Achievers, Conquerors, Daredevils, Masterminds, Seekers, Socializers, and Survivors. The Motivation to Play in Online Games Questionnaire (MPOGQ; [106]) uses three overarching categories of Achievement, Social, and Immersion based on a bottom-up factor analysis. The Digital Games Motivation Scale (DGMS; [45]) uses Social Cognitive Theory [5] and factor analysis to suggest eight motivations for play: Performance, Narrative, Social, Pastime, Habit, Escapism, Agency, and Moral self-reflection.

These questionnaires assess different motivations (i.e., *self-attributed preferences*) for categories of behaviour in games that may have some content overlap with motives (e.g., social motivation is likely related to the affiliation and power motive). However, these player-specific trait assessments are not systematically aligned with motives according to MDT. Further, these game-specific approaches assume that playing games cannot be well explained by theories that explain human-behaviour in general. We propose that the four motives (affiliation, achievement, power, autonomy) and their two orientations (approach, avoidance) applied in a conscious explicit or implicit affective manner can be useful in describing player motivations, experiences, and behaviours.

STUDY METHODS

To investigate the applicability of MDT in the context of pX research, participants played Minecraft in a social context (groups of 3). Implicit and explicit motives were assessed along with a variety of standardized player trait and experience measures. We also logged in-game player behaviours.

Game Environment: Minecraft

Minecraft is a multiplayer sandbox construction game played from the ego-perspective, which allows players to mine in-game resources called blocks that are used to build an infinite variety of structures, such as houses or rollercoasters. Participants played Minecraft (Microsoft, Version 1.9.2) in Survival Mode; they had to fight monsters and could die, in which case their avatar was returned to a dedicated spawn point. Participants chose one of 8 avatars and a name before starting. To prevent participants from focusing solely on mining blocks, they had access to in-game storage containing more blocks than they could reasonably use, and chests with weapons and tools. They could not access Obsidian blocks, which allow players to create portals to another dimension.

Measures

We assessed implicit and explicit motives, player experience, personality, game-related motivations, and behaviour. If possible, we used an existing German version of an instrument; however, for DGMS, a German translation was not available. We translated the DGMS scales and double-checked the results with a team of bilingual experts to ensure accuracy of meaning and nuance. We gathered additional data (e.g., Flow [39]) that we do not report on in this paper.

Implicit and Explicit Motives

Implicit Motives were assessed using the 15-picture version of the Operant Motive Test (OMT; [62]). Each picture is designed to arouse one of the five strategies (S1-S5, described previously) for enacting each basic motive, i.e., affiliation (pictures 1-5), achievement (pictures 6-10), power (pictures 11-15). The 20-picture version including pictures arousing autonomy was not yet available. For each of the 15 pictures, participants were asked to first choose who they identify with; second they were asked to briefly answer three open questions: 'What is important for the person in this situation and what is the person doing?', 'How does the person feel?' and 'Why does the person feel this way?'.

Stories were coded for motive contents, i.e., affiliation, power, achievement, and autonomy. If a motive was present, one of the five enactment strategies (S1-S5) was coded. The strategies were aggregated to compute *approach* (S1-S2), *approach-to-avoid* (S3-S4), and *avoidance* (S5). In approach, higher values indicate more motivation to approach, e.g., to solve a difficult puzzle for the sake of enjoying the challenge. Approach-to-avoid indicates motivation to approach from the desire to avoid a negative outcome, e.g., be friendly to others in order to not be rejected. Avoidance indicates evasion behaviour, e.g., avoiding to engage in a competition to avoid losing.

Five coders were employed. Each picture of the OMT was coded for the four motives and the five strategies by a single coder; to assure quality, all five coders coded the same five stories in the 20 categories (Fleiss' Kappa: 51.8% (moderate) overall; 72.4% (substantial) for motive and 43.0% (moderate) for the 5 strategies; agreement levels were described according to the suggestions by Landis and Koch [63]) and then coders received individual feedback and further training from an expert coder, before they coded the remaining OMT stories. Quality was controlled by an expert coder.

Explicit Motives were assessed using the Motive Enactment Test (MET; [60]) and the Freedom Enactment Test (FET; [61]); combined, they measure the strength of explicit motive dispositions, representing affiliation, achievement, power, and autonomy. The instruments can distinguish different enactment strategies. However, in the present study, we only assessed explicit approach motivation and explicit avoidance motivation respectively for each of the four motives using a 4-pt Likert-scale.

Personality, Player Experience, and Game Motivation

Big Five: Personality was assessed using the German NEO-FFI (60 items, 5-pt Likert scale [15]). **Self-Esteem** was measured using the Rosenberg Self-Esteem scale (10 items, 4-pt Likert scale [24]). **Explicit game-related motivations** were measured using the Digital Games Motivation Scale (DGMS, 43 items, 5-pt Likert scale [45]). **Play Style** was

measured with a modified version of the BrainHex survey (30 items, 5-pt scale [75]).

Chat Behaviour

Chat logs were coded for the percentage of messages for each player that included: the number of smileys; the number of messages concerned with the mechanics and controls of the game, e.g., 'which key do I use to eat?' (game-relevant); the number of messages referring to the task of building a house, e.g., 'should we start building the house or is something still unclear?' (task-relevant); and the number of messages that neither concerned the game mechanics nor the task, e.g., 'I wanted to catch the pig first' (task-irrelevant). The message coding was handled by a single coder as messages either included a smiley or not, talked about the task or the game, or neither talked about the task nor the game.

Likeability Ratings

Participants were asked to answer questions regarding each of their fellow players individually. 5 items for each player were used to calculate likeability ratings and were answered on a 5-point Likert scale. They included items like 'I liked player 1 very much' and 'I found player 1 to be very dislikable'(R). As the likeability index was a scale created for this study, we report that Cronbach's alpha was .843.

Participants and Procedure

121 participants were recruited from the student pool of the University of Trier and the University of Applied Sciences Trier and compensated either with course credit or 10€. Participants were scheduled to play in groups of 3 (41 groups). One participant volunteered as a third player for two sessions in which a different person missed the appointment – he was not aware of the purpose of the study; only his first session's data were included. We asked for participants who play video games in general and were familiar with 'WASD' controls as the keyboard was used for movement and the mouse for panning and tilting the camera. The game Minecraft was not mentioned when recruiting participants. The study was performed in a laboratory that allowed us to separate participants into sound-proof cubicles – communication was only possible through the in-game chat system. Participants were placed separately in the cubicle without seeing each other or interacting with each other in any way.

Three groups (9 participants) were eliminated from the analysis because of technical problems, e.g., not being able to connect to the server, which affected the whole group. Three individual participants were also removed for a lack of compliance, e.g., not moving the character, which did not affect the other participants in the group, leaving a total of 109 participants (36% female, 0% other; mean-age=23.4, SD=3.5).

Participants had played video games for an average of 12.85 years (SD=4.76) and were currently playing video games on an average of 4.13 days per week (SD=2.6); 53 participants (47.7%) reported having played Minecraft before and two participants (1.8%) had never heard of Minecraft.

Participants completed the trait questionnaires, followed by a Minecraft tutorial, and instructions for play: *'You will now spawn in Minecraft together with two other players. The task is to build a house within the next 30 minutes. There are no restrictions or rules on how to fulfill this task. For a faster start you will find some materials within chests. You can use the chat window to communicate with the other two players'.* Participants entered the game at the same time. After 30 minutes of free play time, participants were redirected to the second set of questionnaires, including measures for player experience and game-related motivation.

Analysis

Analyses were performed using IBM SPSS Statistics 24. Participants were treated as individual samples. For analyses including implicit motives, participants with more than two stories resulting in zero-codings were excluded (n=16). Zero-codings are used for written stories of participants that do not contain content related to a specific motive, such as 'I don't know'. If more than two stories have zero-codings, the motive dispositions between participants become less comparable. For analyses regarding chat log coding, participants who did not use the chat during the experiment were excluded (n=14). One participant who did not use the chat was also excluded for zero-coding stories.

RESULTS AND INTERPRETATION

We present three analyses. First, how explicit and implicit motives correspond to measures of personality, player motivation, and play style. Second, how the affiliation motive predicts in-game behaviour. Third, that the affiliation motive explains additional variance in player behaviour, even when we control for explicit measures of player personality and motivation. We focus on the implicit affiliation motive, because the study was conducted in a social play situation.

Connecting Motives to Player Traits used in pX Research

Our first goal was to show how explicit and implicit motives connect to measures of personality, motivation, and play style, when taking approach and avoidance motivation into account. Correlations with explicit motives are seen in Table 1; Correlations with implicit motives are displayed in **Table 2**; For brevity, only the most notable patterns and correlations are discussed.

Due to the exploratory nature of this study, we calculated 420 correlations between 20 motive categories and 21 other questionnaire variables. Because multiple tests could lead to alpha error accumulation – meaning that about 5 in 100 correlations are significant by chance when using an alpha error level of .05 (also known as 'Type I error' or 'false discoveries') – we applied a Bonferroni correction, which adjusts the significance level to $p<.00012$. Thus, correlations displayed in red (Table 1 & 2) are almost certainly meaningful. Because the Bonferroni correction is a strict criterion, we also report the common significance levels of .05 and .01.

Explicit Motives

For explicit motives, we found several correlations with questionnaire measures of personality and player motivation, confirming our expectations that there is significant overlap in the variance explained by these different frameworks.

Personality: Explicit motives correlate strongly with the Big Five and Self-esteem, but some personality factors correlate with more than one – or even all – of the explicit motives. Self-Esteem and Extraversion are both connected to a number of motives and in all of these relationships, they are positively associated with approach motivation and negatively with avoidance motivation. This pattern also applies for Neuroticism, but in reverse. The strongest link between Extraversion and explicit motives was with affiliation motivation, suggesting that these constructs share variance. Low Self-esteem and high Neuroticism are associated with avoidance motivation. This connection is expected [40], indicating that a high sensitivity for negative affect (i.e., high Neuroticism) leads to a motivation to avoid negative emotions. We find Openness to be connected to explicit power approach only, which is not consistent with prior findings [40].

Player Motivations: DGMS and BrainHex are most closely connected to the explicit power motive. However, after applying a Bonferroni correction, only one significant link remains between explicit power approach motivation and the BrainHex scale "Conqueror". The Conqueror scale describes a style of play that is close to the theoretical dominance aspect of approach power motivation.

These results could indicate that explicit motives in the offline context might not overlap with explicit motives in the online context for our participants, and that their beliefs about goals, needs, and usefulness offline might not apply equally to their goals in digital games. Another explanation is that the DGMS and BrainHex items do not capture the facets of, for example, the explicit affiliation motive well.

From a theoretical perspective, the Social scale in DGMS consists of both sociability aspects (e.g., 'Keep in touch with friends') – which are closer to the explicit affiliation motive; and status aspects (e.g., 'See your advice followed by other players') – which are closer to the explicit power motive. In fact, these factors were originally separate in the formation of the DGMS, but were collapsed when a bottom-up factor analysis failed to differentiate them. In general, there seems to be a power focus in the game-related questionnaires 9as evidenced in the pre-correction correlations), which is not surprising with many elements of games including competitions, leaderboards or ranking systems and status symbols.

Implicit Motives

For implicit motives, we find few (and only two Bonferroni-corrected) significant correlations with explicit measures, confirming our expectation that they share little variance with explicit measures assessed via self-report.

Personality: The only significant connections between implicit motives and questionnaire measures strong enough to remain after applying Bonferroni correction were found between low self-esteem as well as high Neuroticism and avoidance motivation in the affiliation motive. This is interesting because the affiliation motive is seen as an experience-oriented motive [2] and likely connected to strong and therefore possibly conscious, negative feelings, when frustrated.

Player Motivations: No correlations between implicit motives and player motivations were substantial enough to remain after the Bonferroni correction.

	Explicit Motives							
	Affiliation		Achievement		Power		Autonomy	
Strategy	a	b	a	b	a	b	a	b
	a) Approach; b) Avoidance							
Self-Esteem								
Self-Esteem	.379***	-.549**	.302**	-.540***	.220*	-.555***	,04	-.457***
Big Five								
Neuroticism	-.323**	.655***	-.311**	.584***	-,11	.542***	,01	.564***
Extraversion	.642***	-.306**	.333**	-.373***	.248**	-.350**	-,07	-.272**
Openness	,17	,14	,15	,18	.375***	,07	,15	-,01
Agreeableness	.237*	-,03	-.228*	-,19	-.279**	-,09	-,19	,00
Conscientiousness	,09	-.213*	.362**	-.193*	,03	-.326**	,11	-,14
DGMS								
Habit	-,06	,09	,03	.208*	.214*	.265**	,01	,09
Moral	-,05	,13	,02	,17	.329**	.283**	,06	,15
Agency	-,01	-,08	,04	,14	,08	,14	,10	,10
Narrative	-,01	,13	-,01	.246*	,14	.251**	,09	,12
Escapism	-,11	,17	,05	.252**	,10	.308**	.220*	.258**
Pastime	-,14	,11	-.210*	,06	-,09	.238*	-,04	.196*
Performance	-,08	-,05	,08	,16	.220*	.199*	,16	,10
Social	,09	,03	,17	-,04	.232*	,09	,07	,01
BrainHex								
Seeker	,10	,08	-,01	.211*	,06	.191*	,10	,11
Survivor	,16	-,02	,12	,06	,18	.206*	,04	,17
Daredevil	,13	-,06	,18	,04	.210*	,13	,07	,06
Mastermind	,07	-,06	.352**	,07	,18	,10	,15	,03
Conqueror	.202*	-.218*	.360**	-,07	.415***	,04	,15	-,04
Socializer	,13	,05	,07	,00	.201*	,08	-,04	,00
Achiever	,01	-,03	,00	,08	,07	,01	.211*	,01

Table 1. Correlations of explicit motives; N=109; significant correlations displayed in bold, *p < .05, **p < .01, ***p<.00012 (Bonferroni correction for multiple tests in red).

	Implicit Motives											
	Affiliation			Achievement			Power			Autonomy		
Strategy	a	b	c	a	b	c	a	b	c	a	b	c
	a) Approach; b) Approach to Avoid; c) Avoidance											
Self-Esteem												
Self-Esteem	,05	-,02	-.500***	-,02	-,09	-,12	.258**	.334**	-,10	,03	-,02	-.302**
Big Five												
Neuroticism	-,09	,04	.434***	-,08	,05	,13	-,19	-.295**	,10	,00	,15	.281**
Extraversion	,10	,07	-,12	-,09	-,01	-,15	,13	.254**	-,08	-,14	,00	-,15
Openness	-,07	-,01	,14	-,09	,04	-,01	-,07	,15	,00	,15	,12	-,08
Agreeableness	,18	,01	,00	,02	-,18	,16	,09	-,12	-,07	-,11	-,09	,10
Conscientiousness	,09	-,01	-.278**	,11	,04	,00	,04	,13	-,06	-,09	-,05	-,10
DGMS												
Habit	,00	-,11	,02	,00	,04	,11	-,13	,03	,03	,08	-,11	-,02
Moral	,02	-,03	,16	-,05	-,02	,04	-,05	,01	,01	,10	,03	-,10
Agency	,01	,01	,08	,11	,02	,06	-,17	-,10	-,02	-,03	,03	-,02
Narrative	,03	-,05	,10	,01	,07	-,03	-,16	-,01	-,02	-,01	,13	-,01
Escapism	,00	,05	,19	,10	,03	-,03	-.244*	-,07	,18	-,17	,15	.195*
Pastime	,02	-,14	,08	,06	,04	,00	-,10	,04	,07	,02	-,15	,15
Performance	,07	-,15	-,01	,09	,09	-,06	-,12	,01	,00	,09	,09	-,10
Social	.239*	-,05	,07	,09	-,02	-,04	-,06	.190*	-,04	-,05	-,14	-.269**
BrainHex												
Seeker	,04	-,07	.322**	,08	,05	-,03	-,09	-,13	,05	-,03	-,01	,15
Survivor	,06	-,08	,01	,09	,08	,02	-,11	-,02	,08	,04	,12	-,02
Daredevil	,12	-,03	,05	,01	,11	-,07	-.193*	,05	-,08	-,07	,10	-,07
Mastermind	-,03	-,17	-,04	,09	,03	,02	-,07	,14	,03	,03	-,05	-,10
Conqueror	,10	-,14	-,03	,08	,03	-,02	-,09	.266**	-,09	,04	-,12	-.197*
Socializer	.199*	-,08	,09	,05	-,09	-,06	,01	.221*	-,05	,02	-,18	-.205*
Achiever	,05	-,03	-,05	,03	,11	-,08	-,03	-,03	,03	-,04	,05	-,03

Table 2. Correlations of implicit motives; N=93; significant correlations displayed in bold, *p < .05, **p < .01 ***p<.00012 (Bonferroni correction for multiple tests in red).

Implicit Affiliation								
Approach		Approach to Avoid		Avoidance		Model		
beta	*p*	*beta*	*p*	*beta*	*p*	*F*	*p*	*R-sq*
Likeability Ratings for Other Players						*F (3,89)*		
1.384	.002	-.369	.347	.360	.268	4.034	.010	.120
Number of Smileys Used								
.109	.393	-.056	.619	.201	.034	1.779	.157	.057
Number of Task Relevant Messages						*F (3,73)*		
-.098	.419	-.137	.208	-.003	.975	.701	.554	.028
Number of Task Irrelevant Messages								
.060	.573	-.240	.013	.126	.098	3.033	.035	.111
Number of Game Relevant Messages								
.066	.598	.407	.001	-.008	.929	4.545	.006	.157

Table 3. Regression models for predicting behaviour with the implicit affiliation motive (significance in red).

		Likeability Ratings for Other Players			
Block		*F*	*p*	*R-sq*	*ΔR-sq*
1	Extraversion, Agreeableness	3.835	.025	.079	-
2	Explicit Affiliation: Approach, Avoidance	2.409	.055	.100	.021
3	Self-Esteem	2.013	.085	.105	.005
4	DGMS Social, BrainHex Socializer	2.690	.015	.183	.078
5	Implicit Affiliation Motive Strategies	2.748	.006	.253	**.070**

	Number of Smileys Used				*Task Relevant Messages*			
Block	*F*	*p*	*R-sq*	*ΔR-sq*	*F*	*p*	*R-sq*	*ΔR-sq*
1	.465	.629	.010	-	.643	.529	.017	-
2	.363	.834	.016	.006	.526	.717	.029	.012
3	.476	.793	.027	.011	.514	.765	.035	.006
4	1.677	.126	.123	.096	.940	.482	.088	.053
5	1.468	.167	.153	**.030**	1.006	.448	.134	**.046**

	Task Irrelevant Messages				*Game Relevant Messages*			
Block	*F*	*p*	*R-sq*	*ΔR-sq*	*F*	*p*	*R-sq*	*ΔR-sq*
1	3.793	.027	.094	-	.239	.788	.006	-
2	2.379	.060	.118	.024	1.150	.340	.061	.055
3	1.938	.099	.122	.004	1.024	.410	.068	.007
4	1.648	.137	.145	.023	.767	.617	.073	.005
5	2.523	.012	.280	**.135**	2.216	.027	.254	**.181**

Table 4. Additional variance explained by the implicit affiliation motive in hierarchical regressions (significance in red).

The Affiliation Motive and Game Behaviour

Our second goal was to show how implicit motives can predict and explain behaviour in digital games, thus we conducted regressions for the social behaviours that we logged and coded within Minecraft play. We considered only the implicit affiliation motive, entering all three strategies (approach motivation, approach-to-avoid motivation and avoidance motivation) into one regression model for each behavioural dependent measure (see Table 3).

The implicit affiliation approach motivation, but not approach-to-avoid or avoidance motivation, predicts the likeability ratings of other players. Approach-to-avoid motivation predicts a higher percentage of game-relevant chat messages and a smaller percentage of task-irrelevant messages. Implicit affiliation avoidance motivation predicts more frequent use of smileys. Approach or approach-to-avoid motivation do not predict the use of smileys. The implicit affiliation motive does not predict a preference for task-relevant messages.

Explaining Additional Variance using Implicit Motives

Our third goal was to demonstrate that implicit motives can explain additional variance, even when controlling for explicit motivations and personality. To show their added value, we added the implicit affiliation motive to hierarchical regression models comprised of other constructs that are also relevant to social behaviour. First, in Block 1, we entered the personality factors of Extraversion and Agreeableness; in Block 2 we added the explicit motive scales of approach and avoidance affiliation; in Block 3, we added self-esteem; in Block 4, we added the DGMS Social and BrainHex Socializer scales. Finally, in Block 5, we added the three implicit affiliation motive strategies (approach, approach-to-avoid and avoidance). The results are displayed in Table 4.

Interpretation and Discussion of Predicting Behaviours

One advantage of implicit motives is that they do not correlate well with explicit questionnaires (as shown in the previous section), yet have still been shown to validly predict behaviour [97]. This is assumed to be because they are unconscious and less influenced by social desirability [16]. They can explain different types and aspects of behaviours, while still being more easily accessible than, for example, physiological parameters. Our results support these findings.

We aimed to show that the implicit affiliation motive can predict behaviour in a social gaming context and even more so, that it explains additional variance even when controlling for explicit self-report measures of social motivations. Our results show that approach affiliation motivated people are more likely to rate other players as more likeable, even after only 30 minutes of mutual gameplay. This can be explained by the implicit hope to affiliate with others, which manifests in our study in giving others the benefit of the doubt, even while hardly knowing them. This is a good example of approach behaviour and the hope to bond with others. It does not necessarily mean that they will succeed in their effort for social bonding, but it might increase the likelihood of bonding as compared to an avoidance affiliation motivated person, who is led by an implicit fear of being rejected [43]. While the personality factors of Extraversion and Agreeableness can also explain variance in likeability ratings, and the explicit affiliation motive is also marginally significant, our results show that even after controlling for these other social measures, implicit affiliation approach adds an additional (and significant) 7% of variance in explaining these ratings.

Regarding the chat behaviour of our participants, we observe that individuals with an avoidance oriented affiliation motive use more smileys. This finding is interesting, because using smileys could be considered a rather passive way to decrease the likelihood of being rejected by others. However, when controlling for the explicit social measures, the effect does not persist, although none of the self-report measures significantly predicts the use of smileys.

When we consider message type, our results show that approach-to-avoid motivation is a positive predictor of game-relevant and a negative predictor of task-irrelevant messages. It is important to keep in mind that we are only looking at the proportion of messages sent for each type, which is independent from the raw amount of game-relevant, task-relevant and task-irrelevant messages. We are only predicting which

type of content our participants choose to chat about. In this context, we can see that individuals with a strong implicit approach-to-avoid affiliation motive (meaning the wish to avoid rejection is motivating approach behaviour as an active coping strategy) seem to prefer game-relevant over task-irrelevant messages. This could indicate that they are choosing a safe topic, using the game mechanics and controls as an excuse to chat with and approach others instead of the riskier approach of making task-irrelevant small talk that might be dismissed by the other players. This effect is very strong and while Extraversion and Agreeableness can also predict task-irrelevant messages, the implicit affiliation motive adds an additional (and significant) 13% of variance. For game-relevant messages, implicit affiliation is the only significant predictor, explaining 18% additional variance. Implicit affiliation motivation does not affect task-relevant messages.

Together, our results show how explicit motives relate to more player experience constructs than implicit motives, but that implicit motives can predict player behaviour, even when controlling for explicit measures.

DISCUSSION

The aim of the study was to demonstrate how implicit motives can be a useful addition to the toolbox of methods for understanding player behaviour and experience.

pX questionnaires are a valuable tool for player research; however, they also have limitations. For example, pX questionnaire constructs tend to correlate with each other, as they are influenced by the same cognitive representations. Even the most well-constructed factor analysis cannot point us to the items that we did not include in the pool. This is where a solid and well-researched theory can be useful. While we acknowledge the advantages and value that self-report measures have for personality and motivation research, it is important to also understand how and when they work, what their limitations are and that they are highly influenced by social desirability and cognitive evaluations [73]. They require a substantial amount of self-reflection to accurately predict behaviour and reflect experiences. They are therefore more strongly connected to short-term choices. An immediate and conscious decision, that has to be made, is closely connected to our elaborate cognitions about who we are and what we like at that point in time. This is not always a guarantee for enjoying what we choose to do.

In this paper, we demonstrate the utility of implicit motives in the context of player experience research through a study of a social play situation. Specifically, our results demonstrate the following important findings:

- Explicit motives correlate with self-esteem and personality but less so with motivation for gaming and play style; however, implicit motives do not correlate well with explicit measures of self-esteem, personality, motivation for gaming, or play style, as is expected and explained by MDT.
- The implicit affiliation motive significantly predicts social aspects of in-game behaviour.
- The implicit affiliation motive adds significant explanatory value in predicting social aspects of behaviour, even when controlling for the socially-relevant explicit measures that describe players' personalities, motives, motivations, and play styles.

Integration of Motive Dispositions and Universal Needs

The idea that all humans profit from having their basic needs of competence, autonomy, and relatedness satisfied does not necessarily mean that they all require the same things to choose high agreement on a need satisfaction scale. While one person might feel a complete satisfaction from having one long-distance friend in their life, others might require five very close acquaintances, interacting with at least one of them every day until they are ready to 'strongly agree'. With all the advantages that basic need satisfaction has to explain collective enjoyment of a game, we also have to acknowledge that people differ in their preferences and motivations, because otherwise we would all engage in the same behaviours and make the same choices. In this sense, need satisfaction is partially an outcome of having made the right, need-congruent choices whereas motives might guide choices and motivate corresponding behaviour [85,95]. The Big Five alone are not able to completely explain all of these interpersonal differences and motives can add to our understanding of player personality. For example, being an introvert does not necessarily mean that a person does not enjoy feeling close to other people. Being an extravert does not explain whether we want to lead or help people or just enjoy our time with them. Motives can help to understand what types of experiences people actively seek out and what drives these choices.

Application of MDT in pX Research

Understanding and predicting behaviour and experiences, especially when accounting for individual differences, is complex. We cannot assume that one theory or construct can describe an aspect independently from all the other factors. If we want to understand gamers specifically, and humans in general, we have to consider the motivations underlying people's behaviours, instead of simply describing them.

Explicit motives can give us an idea of what a player believes is important in the context of games. For example, she could think that it is very important or valuable to do well (achievement), to just be with and talk to others (affiliation), to guide the others through a mission and prove her knowledge (power), or to experience pride when succeeding (autonomy). These interpretations do not explain well how much these experiences will actually be enjoyed, because people can deceive themselves about their preferences, for example, because of how they wish they could be.

Implicit motives are largely independent from explicit measures, and thus provide unique value. They should explain the frequency of various spontaneous behaviours, because of their nature as affectively rewarding. They are thematically connected to the same goals as explicit motives, with the advantage of being less influenced by social

desirability and complex thoughts leading to a conscious conclusion. An affiliation-motivated player might leave a play situation happy because of a fun conversation that was unrelated to the challenge of the game, or disappointed because the other players have been rude and unresponsive. An achievement motive could lead to enjoyment of finishing a level successfully despite its challenge, while a player with a low implicit achievement motive might just be interested in completing it quickly. A power-motivated person may derive pleasure from having others follow their advice, or feel frustration if their leadership is thwarted. The disadvantage of implicit motives is that individuals might attribute their positive or negative emotions to different events that occur simultaneously, meaning that cognitions can overshadow implicit needs. However, enjoying a certain experience tends to increase the chances of it being repeated in the future [70,30], which could explain the long-term behavioural trends predicted by implicit motives. Further, when affective and cognitive preferences are congruent, either because of successful self-reflection or by chance, need satisfaction, flow, immersion and enjoyment should reach the highest levels in players.

Utility for Industrial Games User Research

Implicit and explicit motives have value to offer for games user research in both academic and industrial contexts. First, in a theoretical manner, they could be used to guide design through a persona-based approach [21,26,51]. Once understood, it is straightforward to use motive dispositions to characterize players and guide game design; it is conceivable to design a game for a person with high-affiliation approach, but difficult to imagine what a game targeted at, for example, extraverts would look like. Second, implicit motives will likely provide value in predicting and explaining behaviour in the context of data analytics. Third, integration of both explicit and implicit motives to understand player preferences and behaviour together would be beneficial for suggesting specific roles or activities in a game that would match a player's motives, making it more likely that they would enjoy initial play experiences. Fourth, motives can also be a useful tool to market games to the right players who would enjoy them. To do so requires an understanding of the different reasons that players have to engage in the same game content. For example, do they mainly enjoy the dungeon because they like the challenge of a boss fight, because they enjoy being part of a team, because they enjoy leading the team, or because they want to possess certain items?

Limitations

The main limitation preventing the application of motives in the context of games user research is the intensity of gathering and coding the projective tests. As such, there is a need to develop a better tool for assessing implicit motives.

There are several other limitations to our work. Our work is fruitful, but not exhaustive; the nature of our work is exploratory and we present preliminary results that can be used in future research to derive testable hypotheses with more complex models. Further, MDT is too rich to be fully captured in a single study; future work in varying contexts is required to deeply connect MDT to other pX theories. Finally, we acknowledge that German university students present a relatively homogeneous group. Future research would benefit from including a more diverse demographic.

CONCLUSIONS

Understanding the choices that players make and the behaviours that they exhibit in games are two of the central goals of player experience research. In this paper, we introduce Motive Disposition Theory as a new lens for understanding players, contrast the use of explicit and implicit motives with existing player experience methods, and demonstrate that the implicit affiliation motive can predict behaviour in a social play setting, even when controlling for explicitly-accessed social constructs of play style, personality, and motivation. Our results demonstrate the utility of implicit motives in player experience research as they access affective preferences, not conscious ones. We discuss how explicit motives explain the choices that we consciously make, but implicit motives describe the aspects of our experiences that bring us pleasure – both notions that are relevant to play.

Motive Disposition Theory – and implicit motives in particular – bring a valuable new perspective and set of assessment tools that can help us better understand players, the choices that they make, and what drives their behaviour in digital games.

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Chapter 3:

Power Play: How the Need to Empower or Overpower Other Players Predicts Preferences in League of Legends

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Power Play: How the Need to *Empower* or *Overpower* Other Players Predicts Preferences in League of Legends

Susanne Poeller[1], **Nicola Baumann**[1], **Regan L. Mandryk**[2]
[1]Department of Psychology,
University of Trier, Germany
{poeller, nicola.baumann} @uni-trier.de

[2]Department of Computer Science,
University of Saskatchewan, Canada
regan.mandryk@usask.ca

ABSTRACT
The power motive describes our need to have an impact on others. Relevant in contexts such as sports, politics, and business, the power motive could help explain experiences and behaviours in digital games. We present four studies connecting the power motive to role and champion type choices in the MOBA game League of Legends (LoL). In Study1 we demonstrate that overall power motive does not predict role preferences. In Study2 we develop a 6-item-scale distinguishing between two facets of power in game settings: prosociality (empowering others) and dominance (overpowering others). In Study3 we show that prosociality and dominance uniquely predict role preferences for Support and Top Lane. In Study4 we demonstrate that champion type choice (tank, fighter, slayer, controller) is uniquely predicted by dominance and prosociality. We provide insight on how the wish for vertical interactions with other players—the power motive—can influence player interactions in multiplayer games.

Author Keywords
Motive disposition theory; digital games; player types; explicit motives, power motive; player preferences.

CSS Concepts
• **Human-centered computing~Human computer interaction (HCI)**; User studies; Interactive games; Massively multiplayer online games; Computer games

INTRODUCTION
In player experience (pX) research, we wish to understand what draws people to different types of play experiences—what attracts one person to choose a certain game, genre, in-game role, or character, when someone else is enticed by other choices? A number of player type models (e.g., [23, 44, 56]) help to characterize players and to explain their differing preferences, including choices about whether to play alone or with others. The gaming landscape shows that social—rather than individual—play has become the dominant form: gamers spend an average of 6 hours/week playing with others online and 5 hours/week playing with others in person [15], and the majority of gamers play in multiplayer mode at least weekly because they feel that video games help them connect with friends and family [15].

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But just as approaches for connecting with others in the physical world can differ (e.g., one person may enjoy a few deep intimate friendships and another may enjoy knowing everyone in town more superficially), it is likely that not everyone who enjoys multiplayer games is interested in the same type of in-game social interaction. One person may be motivated to affiliate primarily by enjoying other players' company, for example by chatting while walking around in the game world (i.e., horizontal relationships [11]), whereas another may be motivated to lead others, for example by directing teammates during a raid (i.e., influence others in a more vertical structure [53]). Further, those who wish to influence others may prefer to do so by raising them up, for example by providing temporary immunity to those who engage the enemy (i.e., empowering them) or by exerting dominance over them, for example by triumphing in a player-versus-player battle (i.e., overpowering them) [39]. To differentiate the range of social motivations in games, we turn to Motive Disposition Theory (MDT, [37]), a theory that acknowledges, that not all individuals are motivated by the same things: the strength of needs, even ones as universal as belonging [8] depends, on the individual. MDT distinguishes personality-specific aspects of motivation for four motives: achievement, autonomy, affiliation, and power, which is the need to influence others [46].

We explore power [53] because vertical interactions between players are a fundamental part of multiplayer games (e.g., leading guilds and teams, competition, leaderboards, status symbols), yet game designers and researchers have little guidance on whether or not the need to influence others translates into games. We know from research in other contexts that leaders are more successful depending on the strength of their power motive [41, 54, 55], but not whether individuals drawn to leadership in a game are differently motivated. Power dynamics (e.g., stabbing a friend in the back, literally, in order to triumph), are uniquely acceptable in a game due to entering the 'magic circle' [27], and might affect the expression of the power motive in games.

We explore how the power motive predicts preferences in the popular Multiplayer Online Battle Arena (MOBA) genre. Through four studies, we explain how the power motive translates into League of Legends [20], and show that by

considering two facets of power (*dominance*—a need to overpower others, and *prosociality*—the wish to empower others), we can predict both role and champion type preferences. Important for game design, matchmaking systems, games user research, and marketing of games, our results contribute to the application of a theory relatively unknown in pX research, a new measurement tool, and experimental characterization of predictive relationships.

People are social creatures; our interactions with one another drive our behaviour in ways that are more complex and nuanced than simply being motivated by a desire for fellowship. These distinct facets of social motivations are expressed in our preferences and behaviours, and our four studies extend these findings into the space of digital play.

MOTIVE DISPOSITIONS: A PRIMER

To explain interpersonal differences in motivation, we apply Motive Disposition Theory (MDT, [37]) to games research. In MDT, explicit motives (also referred to as self-attributed needs [42]) are conscious motives, influenced by how individuals view themselves. Traditionally, three motives (i.e., affiliation, power, and achievement) are recognized [37, 42, 46]; however, a fourth motive (autonomy) is presently under validation [3]. Achievement-motivated people want to increase their own performance and reach high standards of excellence [40]. The autonomy motive is described as the need to feel self-worth and have power over oneself [2, 3]. Both affiliation and power are social motives that concern relationships to others [55]. Affiliation is characterized as a wish to form mutually-satisfying relationships with others [11], whereas the power motive is a need for relationships with the aim to influence or have power over others [38, 39].

Assessed through self-report measures, (i.e., questionnaires such as the *Personality Research Form*, the *Motive Enactment Test* or the *Unified Motive Scales* [28, 31, 42, 48]), explicit motives are influenced by social desirability [18, 43]. Rather than treat this as a nuisance, MDT embeds the notion of social desirability into the construct of explicit motives. *Because* explicit motives are highly influenced by values and conscious thoughts about what is desirable, they are assumed to predict short-term preferences and choices, especially when incentives are present [42] (e.g., a party for affiliation motivation; a competition for power motivation). Explicit motives expressed in gaming should therefore relate to conscious reflections about preferences for playstyles, classes (e.g., mage or warrior) or roles (e.g., healer or tank), in people experienced with these classes and roles.

A VARIETY OF SOCIAL MOTIVATIONS

High levels of multiple motivations can be present in the same person, e.g., a person may wish to reach high standards of excellence *and* influence others, thus explicit motives may correlate to some extent. In MDT, the power and affiliation motives are distinct [37], yet both are social by definition and require interactions with others [55]. A way to distinguish them is that the affiliation motive recognizes a desire to form relationships on a horizontal level; whereas power-motivated individuals strive to interact with others on a vertical level, meaning they have a drive to feel superior. Achievement and autonomy motives are not free from social components [25]. For achievement, social comparison (performing better than others) can play an important role [45]. In games, this can lead to players comparing their performance to others. For autonomy, it can be beneficial to be praised by others in order to feel contingent self-worth. Distancing oneself from others is another essential part of the autonomy motive [2, 3].

In gaming research, the power motive is a neglected type of social motivation. Power-motivated social interactions are not about feeling close to or bonding with others. Feeling in power usually means that another person has less power (e.g., is weaker or needs help or guidance). For explicit power motivation, the context can be important [29], e.g., due to reasons of social desirability: in most contexts, wanting to exert power over others is not considered socially acceptable [17, 39]. Some authors conclude that it may be wise for individuals to not be open about their need to have power over others, even if the need to influence others is driven by prosocial motivations, such as helping them, because they might risk being subject to accusations of manipulating others [39]. However, in video games, even dominating other players can be considered socially acceptable while successfully defeating enemy players in the game world helps to win a battle, which is arguably the goal in many games. Some questionnaires about game motivation have recognized that impacting other players in this way can be a rewarding experience. In BrainHex [44], the *Conqueror* scale includes nuances of power motivation; in DGMS [23], *status* was originally separated from *sociability* but combined after a factor analysis. Through the lens of MDT, the resulting DGMS *Social* scale consists of power (e.g., 'Gain respect from others for what you have accomplished') and affiliation motivation (e.g., 'Keep in touch with friends'). We argue that in theories of motive-driven behaviour, multiple facets of social motivation should be recognized (rather than treating a desire for social interaction as a monolithic motive) *if* they predict divergent behaviour.

Facets of Power

Breaking down social motivation into power and affiliation refines broad categories into more defined topics, yet a motive is still a vast description for several distinct incentives. People who start fights and people who support others share the motivation to have impact on others [39], but we show the benefits of distinguishing between these behaviours. When motives, as described in MDT, are used in research, they are frequently recognized as having additional facets; the primary four motives can be further differentiated into more descriptive categories.

McClelland [39] defined *"two faces of power"* and named them *socialized power*—power thoughts centered around having an impact for the sake of others, and *personalized* power—thoughts centered around dominance and winning against others. Winter [53] used a broad definition of power,

describing it as *the capacity to produce intended effects on the behavior or emotions of another person*. Several different concepts can be connected to this definition, such as leadership, guidance, respect, influence, manipulation, persuasion or tyranny. Winter also proposes the idea that gaining power is an interaction between a person and a situation, how some people manage to subtly change the views of the members of a group before they emerge as the group leader over time, while other people who are low in their power motive do not show the same behaviours. Following Winter's definition, the need for power is depicted as taking an opportunity to gain influence, once it arises, by whichever strategy works best to maximize power in that context [53]. There are often several strategies to gain power that can be seen as facets of this motive. Examples include *prosocial* power—the wish to help and support others [7], *leadership*—the wish to lead, advise and guide others [41], *status*— the desire to be well-known, admired or recognized [4], and *dominance*—a need to feel superior and put others in their place [39]. Although very different in nature, they all have in common a need to have impact on others.

As we are interested in deconstructing the often-neglected power motive in games, we describe two facets in detail that reflect McClelland's [39] two faces of power: prosociality and dominance. We choose these because there is little overlap in their definition, and thus they likely share little variance, whereas other motivational facets of power, such as leadership and status, might be more likely to overlap with both prosociality and dominance, especially in game environments, in which strength often equals prestige.

Prosociality

Power-motivated individuals are not above manipulating or pandering to others to get their way [17], thus being prosocial might not seem to fit the power motive at first glance. However, there is a possibility that individuals who choose to help others do so driven by an ulterior motive. Being prosocially motivated means that there is another person to influence whom is at a disadvantage or needs assistance. That the one receiving help is benefitting is not mutually exclusive with the notion that assisting others or showing empathy might satisfy a need in the power motivated person. Wanting to support, help, and guide others is considered highly socially desirable, and prosocial individuals arguably make most environments healthier [22, 24, 30]. In return, the supportive and prosocial individual is likely to be recognized as admirable and friendly, which is a way of gaining status [5]. They might also increase their chance of receiving favours in return [17]. Power-motivated individuals are often found in helping professions (e.g., teachers or psychologists) [53]. There is evidence multiple motives can be equally strong in an individual and that a combination of a high affiliation and a high power motive can lead to blocking the more aggressive impulses of the power motive [26]. In terms of the applications to games research, from a theoretical perspective, prosocial power motivation should be associated with playing characters that protect, help, and support others, such as healers and supports. In these roles, players help others while also making impactful decisions on which other players are a priority to keep safe, who to revive, or even who is the least important in the team, possibly sacrificing them for the greater good when necessary.

Dominance

Dominance is the facet of power that often comes to mind. It has a negative connotation [39] and is connected to violence and aggression [34, 58], heavy drinking [39] and elevated testosterone in men [36, 50]. Wanting to dominate others means wanting to put them in their place, which often results in fighting and arguing to wear them down (especially with those who challenge the dominant individual) [17]. Dominant players are likely motivated to show others just how powerful they are and that their superiority should never be questioned. Theoretically, we would assume that dominance-motivated players are likely to try to gain an advantage over others in any way possible, even when not admitting that they are doing so. If their own personal strength is not sufficient to fight others, domination tactics could involve exploiting game mechanics, unfair advantages such as starting off a fight in a better position, or simply paying money in free-to-play games to obtain stronger weapons, which is usually referred to as 'pay-to-win'. While it is frowned upon by society to use violence against others, in video games it is normal to duel or compete with others and players high in dominance motivation are possibly the most likely to ask others to 'fight them 1v1' when they wish to prove a point. A stereotypical character choice might involve consistently high damage output as well as moderate defense (like fighters or warriors), so they can overpower others. However, there is no empirical evidence that these in-game behaviours are connected with motive dispositions, even though it would be conform to the MDT. To explore this in a game environment, we chose League of Legends (LoL), the most played online multiplayer game for many years [16] and a still-popular choice among gamers in 2019.

LEAGUE OF LEGENDS AND THE POWER MOTIVE

League of Legends (Riot Games) is a free-to-play MOBA game. It is complex and competitive and features two teams facing each other in battles of about 20–60 minutes. Before a match starts, each player chooses one *champion* (the avatar they will play as). At the time of data collection for the first study (summer 2016), players could choose from 133 champions, each with unique abilities and playstyles.

In the normal game mode, players are divided into two teams of five, fighting each other (see Figure 1). There are five *roles*, and each player on each team picks a role in each match. *Top Lane* is a competitive 1v1 role, in which two players (often tanks and fighters) mainly face each other. *Mid Lane* has the same concept, except players tend to be expected to assist other lanes more and often play champions with less defense (like mages and assassins). In *Bot Lane*, we usually see a 2v2, as generally an *AD Carry* (Attack Damage Carry or marksman, who deals consistent physical damage

and has low defenses) will play together with a *Support*. The latter are mainly helping the AD Carry to become powerful by protecting them, sacrificing their own strength and independence in the process. Support is often played using tanks or champions with supportive abilities, such as shields and healing. The last main role is the *Jungler* (often fighters or tanks, and less often, marksmen or assassins), who moves around the map independently and assists all lanes. These roles are mostly important for the early parts of each game and eventually all players move around as a team.

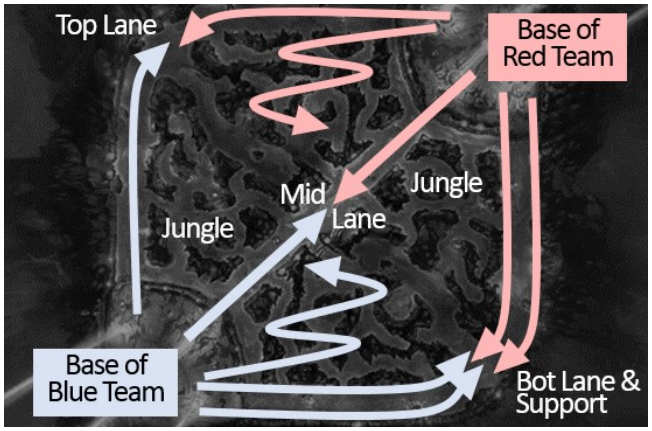

Figure 1. Schematic outline of the League of Legends 5v5 map Summoner's Rift. Each arrow represents one player. Jungler lines are not representative of routes. The Jungle is the entire area between the three lanes.

Taking on a role and then choosing a champion in a MOBA game like League of Legends (LoL) is part of choosing the strategy for how a player will contribute to their own team's success. Similar to team sports, good strategies are more likely to lead to a win. A player can, for example, choose to pick a champion that allows them to initiate a fight or shield their teammates from incoming damage, or one that allows them to stand back and protect teammates with healing abilities. Picking a champion with low defenses and strong attack abilities forces players to depend on teammates for protection, while they focus on slaying enemies.

We strive to understand how the self-attributed need for power—the wish to have an impact on other players—is associated with these strategic role and champion choices. In LoL, effective strategies that contribute to team success can be to protect teammates, overpower enemies, or lead a team into battle. These strategies might be connected with the need for power, especially empowering them, as is usually the task of a support. We form the following research questions:

- Is the self-attributed need for power associated with stronger preferences for the support role?
- Is the explicit power motive associated with other role and champion preferences in League of Legends?
- Do facets of power (e.g., prosociality and dominance) predict different role and champion preferences in LoL?

We assume the support role to be connected to the power motive because it allows a strong prosocial impact on other players, similar to choosing a helping profession in life. Other associations with role and champion preferences are less predictable a priori because several roles allow players to overpower others. As stated before, we assume champions who are strong in one-on-one fights (such as *fighters*), could be associated with a desire to dominate others, since they are robust and often have intimidating appearances. In a series of four studies, we explored these research questions. In Study1, we investigated the link between the support role and the power motive in an exploratory study that was designed to provide an initial understanding. From these results, we concluded that we need to differentiate facets of power (i.e., prosociality and dominance) as well as subtypes of supports in LoL. We created a new set of items to assess the need that players have to help and dominate others in games and tested it in Study2. In Study3, we replicated the findings of Study1 and explored the link between the facets of power and the roles as well as three specific ways of supporting others in LoL. We showed differential predictions of the power motive facets on role preferences. In Study4 we explored the link between power and champion types and again showed differential predictions of the power facets.

STUDY 1

The goal of Study1 was to understand if a preference for support play is connected to the power motive. Because at least one other player (usually a marksman) somewhat relies on their support, it seems a natural choice for people who are motivated by the need to influence others. We report on connections between the explicit power motive and role preferences in League of Legends. We invited active and formerly-active LoL players to participate in an online study and asked them to report on their preferences and habits.

Participants and Procedure

We recruited 175 participants online and at the University of Trier of which 155 participants (mean age=21.9, SD=3.5; female=116, male=96, non-binary=0) completed the entire study. We compensated them with course credit or participation in a lottery for 10 paysafecards, each with a value of 10€. Participants played LoL on an average of 4.6 weekdays (SD=1.9), for sessions of 3.6 hours (SD=2.0). On average, they had 3.3 years (SD=1.8) of LoL experience.

Measures and Analyses

As Study1 was exploratory, we collected several measures we do not report on, including implicit motives [32, 33], self-esteem [12], the Big Five [10], and the Digital Games Motivation Scale [23]. We report on demographics, explicit power, and preferences in League of Legends.

Explicit Power Motive

We used the 4-item power scale of the *Motive Enactment Test* (MET) [31, 49] to measure the explicit power motive. Participants had to rate how much each statement applied to them on a 4-pt Likert-scale. Items included statements such as 'I often provoke arguments with others' and 'In my

daydreams, I often play the role of the hero'. For reliability as well as convergent and discriminant validity see [46, 49].

League of Legends Questionnaires

Role Preferences were measured using agreement with statements (18 items; 3 for each role; e.g., 'I like playing support a lot'; 'I often play support'; 1 statement per role was reverse coded, e.g., 'I do not like playing support'). We asked the same three questions about every role (randomly presented) and aggregated them into a scale for each role. Cronbach's Alphas for all scales are displayed in Table 1.

Further, we had exploratory questions that we do not report on, including thoughts on the Meta and the use of skins.

Analyses were performed using SPSS Statistics 25. We report regressions of the explicit power motive on the preferences for the five roles in League of Legends.

Results

Results for all regressions are displayed in Table 1. Role preferences were not linked to the explicit power motive, as measured with the MET power scale [31, 49].

Brief Discussion

It was somewhat surprising that role preferences in LoL were not related to the power motive. Especially for the support role, we assumed an association with the power motive, as it allows players to have an impact on others in a unique way, including decisions about who receives support in which moment (and who doesn't). We identified three possible explanations that formed the basis for our follow-up studies:

1. Preferences of power-motivated people may depend on whether they report explicit power motivation because they want to help others or because they want to dominate them (i.e., the prosocial or dominance facets of power).
2. A preference for support may depend on playstyle, reflected in support subtypes: e.g., damage supports are likely a less prosocial choice than supports based on healing and other protective abilities.
3. Perhaps there simply is no relationship between the power motive and support or with the other roles in LoL.

We planned a study that would break the power motive into facets and the support role into subtypes, exploring these more nuanced associations; however, to do so, we needed to create new scales to measure different facets of the power motive and test these scales on a standard random sample.

STUDY 2

The goal of Study2 was to measure different facets of power (see Background) in a gaming context. While there are a variety of ways to have impact on other players, such as taking the lead or showing a high status by possession of rare items or a high ranking, the prosociality and dominance facets of power (i.e., the need to empower or overpower others, respectively) are most distinct from one another. While the same person can use both of these strategies at different times, it is unlikely that a single action will be characterized as both dominant and prosocial. In game, while cross-over is possible, prosocial behaviour most likely means wanting to have impact on teammates by helping them, explaining to them, or empowering them. Dominant behaviour is more likely to be exerted on an enemy player by overpowering them, at least when considering strategies that are likely to increase the likelihood of one's team's success.

Researchers in domains other than games have previously applied the method of splitting up the power motive into different facets to distinguish different nuances of the explicit power motive [52]. As MDT states that explicit motives predict behaviour best when measured as closely as possible in context and time [1, 42], we took a gaming-specific approach when phrasing the items of this scale. Our approach is close to McClelland's [39] distinction between socialized and personalized power.

We developed a scale to measure two different facets of the explicit power motive—*prosociality* and *dominance*—in a gaming context and evaluated it on a random sample.

The Scale Items

The initial set of items included eight statements. They were created by three experts in gaming and motive research after reviewing multiple explicit motive questionnaires, and sorting the items into different categories, i.e., sub-facets of power, such as leadership, status, dominance, prosocial power and fear of weakness. The items were tested iteratively in multiple small studies. We retained the three best items for each of dominance and prosociality.

Procedure and Measures

We recruited 386 gamers who "played at least weekly" on

Study 1

	Explicit Power Motive			
		R^2	*Beta*	*t*
Top Lane	*α=.94*	.00	.06	.68
Mid Lane	*α=.91*	.00	.03	.35
Jungle	*α=.96*	.00	.02	.27
AD Carry	*α=.92*	.00	.05	.51
Support	*α=.94*	.00	-.04	-.52

Study 3

	Explicit Power Motive			
		R^2	*Beta*	*t*
Top Lane	*α=.92*	.01	.10	1.13
Mid Lane	*α=.88*	.01	.12	1.36
Jungle	*α=.94*	.01	.12	1.37
AD Carry	*α=.90*	.00	-.03	-.32
Support	*α=.90*	.02	-.14	-1.60

Support Subtypes		R^2	*Beta*	*t*
Classic Support	*α=.91*	.00	.07	.77
Tank Support	*α=.86*	.00	.07	.74
Damage Support	*α=.95*	.01	.08	.97

Study 4

	Explicit Power Motive			
		R^2	*Beta*	*t*
Tank	*α=.78*	.01	.09	.97
Fighter	*α=.70*	.01	.07	.75
Slayer	*α=.73*	.00	-.01	-.08
Mage	*α=.83*	.01	-.10	-.98
Controller	*α=.87*	.00	-.03	-.32
Marksman	*α=.88*	.00	-.01	-.15

Table 1. Regressions between the explicit power motive and role as well as champion type preferences in League of Legends, when not distinguishing facets of power motivation. None of these results were statistically significant.

Amazon Mechanical Turk. We removed participants who completed the survey but did not play games at least weekly from the dataset. According to standard practice [35], we filtered participants who responded faster than 1.5 seconds per item, participants whose answers within a subscale had a high variance (>2SD over the mean variance), or zero variance across all subscale items in a measure, leaving us with 330 participants (mean age=33.6, SD=8.7; female=116, male=213, non-binary=1), who played games either daily (N=161) or weekly (N=169). The study took about 10 minutes and we compensated participants with $2.50 USD.

Participants rated their agreement to three statements for prosociality and three for dominance on a Likert Scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). Individual items and scale characteristics are presented in Table 2. Analyses were performed using SPSS Statistics 25.

	Prosociality	Dominance
Eigenvalue	*2.457*	*1.824*
Cronbach's Alpha	.802	.780
Mean	4.971	4.440
SD	1.222	1.471
Items	*Factor Loadings*	
I enjoy assisting other players when they need help	**.85**	.03
I am eager to provide emotional support for other players	**.82**	.03
I help other players through the difficulties they face	**.88**	.11
I enjoy dominating others in a game	.08	**.86**
I am willing to use aggressive tactics in a game to get my way	-.04	**.80**
When other players challenge me, I want to put them in their place	.14	**.83**

Table 2. Factor loadings and item characteristics of the prosociality and dominance power scales.

Results of Factor Analysis

We performed an exploratory factor analysis (EFA) on the 6 items using principal components analysis (PCA) with Oblimin rotation. Two factors were extracted (Eigenvalues >1), which matched our theoretical model. With a Kaiser-Meyer-Olkin (KMO) index of .70 and a significant Bartlett's test of sphericity (χ^2_{15}=641, p<.001), sampling adequacy was considered good and the total variance explained was 71.3%. All items loaded highly (>.8) and uniquely on their intended factors (see Table 2). Both subscales showed satisfactory internal consistency (Cronbach's alpha>.75).

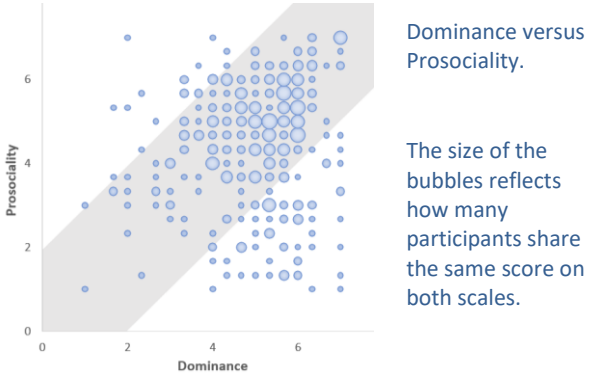

Figure 2. Distribution of our participants.

Means and standard deviations are shown in Table 2 and are above the neutral score of 4 for both subscales. Figure 2 shows the distribution of scores for each participant. As expected, an individual can score high (or low) on both the prosocial and dominant facets of power, or scores could deviate. There is an overall positive linear relationship between the two facets; however, our results show that the two subscales clearly measure different facets of power.

Brief Discussion

We show that the two facets of the power motive, measured by our two power facet scales, are statistically distinct, measuring two subconstructs of the power motive in game play. Further, by phrasing our questions in a gaming context, we access game-related prosociality and dominance. Finally, participants score in the full range of both dimensions. Therefore, we felt confident employing the scales for our subsequent studies, measuring the relationship between explicit power and preferences in LoL in more detail.

STUDY 3

The goal of Study3 was to deconstruct facets of the power motive and the support role to better model their association. In Study1, we expected that the power motive would predict preference for the support role in LoL, but did not find this association when considering power as a whole. As such, we designed Study3 to investigate with more nuance, measuring subtypes of the support role and facets of power (prosociality and dominance) using the scale developed in Study2.

The Support Role in League of Legends

Players in support roles are often helping others in achieving their full potential by offering toolkits that are beyond just dealing damage to enemies. We identified three common ways of playing this role. First, the *classic support* type with abilities to heal, shield, speed up, or increase the damage output of allies. Examples in LoL are *Janna* and *Soraka*. The second type is the *damage support*, arguably a support, preferred by those who have to play the support role although they do not like it. This type is often played by mages (such as *Lux* or *Brand*), using burst damage to keep enemy players on the defense. They can be played in less selfish ways and be used for the utility they offer, but are also characterized by having the potential to become strong when succeeding in this offensive playstyle. The third type is the *tank support*; characterized by having a high defense (e.g., *Braum* and *Leona*), they protect allies by building a front line and keeping enemies at a distance. They engage in fights first, often using abilities to impair others, e.g., stuns and knock-ups (which most support champions have at their disposal).

Participants and Procedure

The study was conducted in January 2018. We recruited 136 regular LoL players for an online study of which 133 (mean-age=22.0, SD=5.2; female=27, male=106, non-binary=0) completed the study and were compensated with course credit or participation in a lottery for 10 10€ paysafecards. Participants played LoL on an average of 5.2 days per week

(SD=1.7) for sessions of 3.7 hours on average (SD=1.8). They had 4.3 years (SD=2.2) of experience with the game.

Measures and Analyses

In addition to the motives of prosocial power and dominance, we also collected explicit motives for other facets of power and implicit motives [32, 33]. We report on demographics, the explicit power motive, and role preferences only here.

Explicit Motives: We measured general power as in Study1, using one subscale of the MET [31, 49]. To investigate facets of power, we used the 6 items as described in Study2 (α=.55 for prosociality and α=.64 for dominance, which was still in a range that was sufficient for research purposes [14]).

LoL Preferences: We measured role preferences with the same 18-item scales used in Study1. Preferences for *support types* were measured with scales of 5–6 items characterizing the type, e.g., 'How much do you like playing supports with healing abilities' (classic support type), 'How much do you like to play supports, which force their enemy to play defensively' (damage support type), and 'How much do you like to play supports, which intercept enemy damage' (tank support type). Cronbach's Alphas are displayed in Table 1. Analyses were performed using SPSS Statistics 25. We report regressions, replicating the results of Study1 and multiple regression models, investigating if power subscales can predict role and support type preferences together. We also test whether or not these two facets interact with each other to explain additional variance (moderation analysis).

Results

In line with Study1 results, regressions for the general MET power scale are not associated with any role or support preferences. These results are displayed in Table 1.

However, as Table 3 shows, when considering power facets in a multiple regression model, we see that the prosociality and dominance scales predict a preference for the Top Lane role together. This role is preferred by people scoring low on prosociality and high on dominance. Both scales together also predict the liking of the support role; this effect is driven by the negative relationship between dominance and support.

		Prosociality		Dominance		Prosociality*Dominance	
	R^2	*Beta*	*t*	*Beta*	*t*	*Beta*	*t*
Top Lane	**.071****	**-.176***	-2.08	**.192***	2.27	.13	1.48
Mid Lane	.01	-.02	-.21	.11	1.22	.09	1.06
Jungle	.02	-.05	-.61	.13	1.48	.01	.13
AD Carry	.01	.05	.52	.06	.71	-.10	-1.11
Support	**.08****	.13	1.52	**-.247****	-2.93	.12	1.48
Support Subtypes	R^2	*Beta*	*t*	*Beta*	*t*	*Beta*	*t*
Classic Support	.04	**.18***	2.09	-.08	-.94	.03	.32
Tank Support	.01	.06	.69	-.08	-.95	.17	1.93
Damage Support	.02	-.01	-.11	.13	1.49	.01	.15

Table 3. Multiple regression models of the explicit power motive facets; N=133. The first column shows how much variance both facets predict together. Significant results are displayed in bold; *p<.05, **p<.01.

While none of the models for support subtype (looking at both facets together) are significant, we see that higher levels of prosociality alone significantly predict variance when looking at preferences for classic supports. There were no significant interactions between prosociality and dominance.

Brief Discussion

Our results support those of Study1—looking simply at general roles and overall power does not explain preferences.

Facets of Power: We first can conclude that to better understand players and their choices, we need to consider distinct facets of power. There is a difference between seeing value in the vanquishing of one's enemies and wanting to help others, even if both have a vertical interaction with another player in common. The MET power scale combines different power facets with items like 'I often provoke arguments with others' and 'Other people often prefer me to be the leader'; however, in Study2, we confirmed that these facets of power can be distinctly accessed through self-report in the context of digital gaming. Our findings in Study3 show that by doing so, we can predict role preferences in an anticipated and explainable way. Specifically, we show that the prediction of power facets on support preferences is driven less by the positive association with the prosociality scale and more by the negative association with the dominance scale. Supports of all types give up individual strength to some degree to help their marksmen grow strong and are therefore less likely to be able to dominate others.

Preferences for Support: Having shown that distinguishing facets of the power motive is valuable, we consider our research questions—and the assumption that subtypes of the support role are distinct preferences and will be differently predicted by power facets. We show that prosociality is only linked to the classic support type (support champions who can protect, heal or shield their enemies), which is arguably the most prosocial way to support another player.

Top Lane: In addition to the findings related to our power-support-hypothesis, we found a strong link between the power motive facets and a preference for playing Top Lane, which is characterized by being both low in prosocial power and high in dominant power. While we did not hypothesize the association of power facets with any roles other than support, these results are not surprising as Top Lane is the role with the strongest 1v1 potential. It is likely the role in which other players interfere the least and as one player slowly gains the lead over the other, they are likely to dominate their opponent. That this role is the one in which a player is least likely to jump in to help teammates in early stages of the game, explains the negative association with prosociality. Further, the champions commonly played in Top Lane are relatively independent fighters, who do not rely on their team to overpower enemy players so they can roam the map on their own and focus on vanquishing foes.

Roles are Limiting: We concluded that the view on role preferences alone might be somewhat limited. While in the most common 5v5 game modes of LoL two teams of five players face each other and can usually select their preferred roles in advance, there is not one unique playstyle for any

role, aside from perhaps the AD Carry role, that mostly features a strong ranged attack damage champion with low defenses (marksman). In Top Lane, common champion types include fighters but also tanks and sometimes a marksman. In the Jungle, players may play tanks, fighters or marksmen as well, and in Mid Lane we often find mages but also assassins and sometimes tanks and marksmen. Therefore, we decided to replicate our study by looking into specific champion types, rather than role preferences, as it is possible that some players will play the same champion or champion type in multiple roles to be more flexible in position choices.

STUDY 4

The goal of Study4 was to consider the relationship between the power motive facets and champion types, rather than roles, to determine how dominance and prosociality relate to specific types of champions (such as marksmen or tanks).

Champion Types in League of Legends

It is not trivial to classify League of Legends champions into one distinct type. In July 2019, when Study4 was conducted, LoL featured 144 unique champions to choose from. Riot Games classifies champions as belonging to one of six categories, i.e., *marksman, mage, assassin, tank, fighter, support* on the game website [21]. However, we follow an approach, published by Riot Games in 2017, classifying champions by 6 categories [19]: *tanks, fighters, slayers, mages, controllers* and *marksmen*. We embrace this classification because firstly, it allows for a distinction between the support role and the support type. Most *classic supports* now belong to the controller category. The majority of *tank supports* are captured by the tank type and *damage supports* are mostly represented by the mage type. Secondly, there is now the category *slayer*. It features assassins but also champions close to the fighter category, which do not have defenses as high as fighters and fit into the "kill fast, die fast" category with their high damage output while not being inherently "tanky" (e.g., *Riven*). While it is common to play certain champions in specific roles, such as controllers as supports, there is no rule, forbidding a champion to be played in other roles.

Participants and Procedure

We recruited 108 regular LoL players for an online study of which 103 (mean-age=21.8, SD= 2.8; female=30, male=73, non-binary=0) completed the study and were compensated with course credit if they studied at the University of Trier. Participants played LoL on an average of 4.5 days per week (SD=1.9) for sessions of 3.4 hours on average (SD=1.4). They had 5.4 years (SD=2.9) of LoL experience.

Measures and Analyses

Explicit Motives: We measured the MET general power scale [31, 49], as in Studies 1 and 3. For dominance and prosociality, we used the same scale as in Study2 and 3 (α=.70 for prosociality and α=.77 for dominance).

LoL Preferences: Type preferences were measured with scales of 4–5 items, e.g. 'I like to play champions which deal a lot of magic damage' (mage), 'I like to play champions which heal or shield their allies' (controller), and 'I like to play champions with high defenses' (tank). Internal consistencies are displayed in Table 1.

Analyses were performed using SPSS Statistics 26. We report regressions with the general explicit power motive to allow for comparisons with Studies 1 and 3 and multiple regression models to investigate if our two power subscales can predict champion type preferences together. We also test whether or not these two facets interact with each other to explain additional variance (moderation analysis).

Results

Similar to the previous studies we find that the general need for power does not predict champion type preferences in LoL (Table 1). Only when we look at *how* they want to influence others can we use the power motive to explain choices.

By considering two facets of the power motive, we can significantly explain preference for four out of six champion types. A preference for playing tanks is positively associated with prosociality and negatively with dominance. Both fighter and slayer champion preferences are predicted by power facets, driven by the positive association with dominance. Conversely, the preference for controllers is positively associated with prosociality. We do not see any interaction effects between prosociality and dominance on champion type preferences. Results are displayed in Table 4.

		Prosociality		Dominance		Prosociality*Dominance	
	R^2	*Beta*	*t*	*Beta*	*t*	*Beta*	*t*
Tank	**.164*** **	**.323*** **	3.53	**-.223***	-2.43	.04	.41
Fighter	**.073***	-.02	-.25	**.267****	2.76	-.06	-.60
Slayer	**.171*** **	-.03	-.34	**.411*** **	4.51	.05	.53
Mage	.00	-.04	-.39	.03	.34	-.04	-.37
Controller	**.102****	**.277****	2.92	-.14	-1.48	-.01	-.08
Marksman	.00	.04	.42	.04	.44	-.10	-.99

Table 4. Multiple regression models consisting of power facets; N=108. The first column shows how much variance both facets predict together. Significant results are displayed in bold; *p<.05, **p<.01, ***p<.001.

Brief Discussion

Our results again support those of Studies 1 and 3—looking simply at overall power does not explain preferences.

Facets of Power: Our results on champion type preferences confirm that considering facets of the power motive together is necessary to predict champion type preferences. The overall MET did not predict champion types, but the gaming-specific dominance and prosociality scales did. Specifically, the positive association with prosociality and controller was expected as several champions that can be attributed to this category can be played as a classic support type.

Champion Preferences: Our results show that there is value in looking into preferences for specific champion types when predicting in-game choices. Our findings show that the explicit need to impact other players in two different ways—i.e., by empowering others or overpowering them—can help explain champion type choices.

GENERAL DISCUSSION

According to our findings, the need for power affects how players choose their roles and champions in the MOBA game LoL. If we simply consider the general need to influence other people (i.e., overall power motive), we cannot predict any of these choices; however, if we incorporate the duality of power [39], we gain valuable insight into preferences.

Dominance and Prosociality

In Study2 we learn that the two different facets of the explicit power motive that we distinguished here, i.e., prosociality and dominance, are independent from each other. For some players, these strategies overlap. Winter [53] described the need for power as a likelihood to opportunistically choose strategies that best fit a situation in order to gain influence. Thus, the same person can be prosocial or dominant in different situations. This might, for example, depend on who they are playing with (e.g., a group of friends or strangers)

Our dominance scale exclusively asks about in-game behaviour and the desire to beat people in games. If a person has a strong need to dominate others, games might be one of the best outlets for this motive, as defeating an enemy avatar does not do any physical harm to the other player and is often the intention under which both players enter the game. Given that vanquishing one's foes is often part of game mechanics, it would be incongruent to compare the choice of a champion that can bring down the representation of enemy players in a game to actual acts of violence in the physical world. In fact, being successful in defeating enemy players in LoL often allows for the player to receive a high status and admiration from others, both being outcomes that individuals high in the need for power are likely to strive for [17].

Tanks, Supports and Prosociality

In studies 3 and 4 we can see how both strategies together allow us to understand players better. We learned that supporting is preferred by players who do not wish to exert dominance over others. However, there are complexities to this motivation, fitting the intricacy of the role. Those with high self-reported prosociality declare themselves more likely to choose a healer or a shielding support, giving up on individual strength to empower others. However, we also learned that the highest association with prosociality is not for controller type or classic support champions but instead for tank champions, except not for tank supports. This effect seems to be driven by players who prefer to play a tank in other roles. Tank players seem to have the lowest reported levels of a need to dominate enemies. These results are understandable as tank type champions and supports are unlikely to dominate the enemy team on their own because they often do not have enough damage to substantially lower the health points of opponents.

Looking at the distribution of prosociality and dominance in Study2 and combining them with our findings from Study3 and 4, we get an idea why it can sometimes be hard to find players willing to play in the support role or who will pick the tank that is useful to have for any team: It does not seem like there are very many players who score low on the need to dominate other players, i.e., those who like to play support or tanks in our model. Designing them so that they also appeal to more dominant players might be a way to make these champions more popular. The high prevalence of the need to dominate others in our sample is an indication that dominance and crushing enemies is indeed a big part of gamer motives and not so frowned upon in a gaming context.

Top Lane, Fighters, Slayers and Dominance

Our models identify the role that players high in dominance seem to prefer: Top Lane, the most independent lane in LoL, often featuring challenging 1v1 matchups. Specifically, it seems that players high in dominance like to play fighter and slayer champions, which are commonly used in Top Lane. What slayers and fighters have in common is a high potential to take out opponents on their own. Fighters also have relatively high defenses, making them a fitting choice for those who wish to overpower others. Slayers have an even higher damage potential than fighters, making them very capable of finishing off foes, however they do not have the same defenses. Slayers instead often have abilities that allow them to escape from the fight after bursting (dealing huge amounts of damage in a short period of time) down an enemy player. If they do not succeed in killing them, they are still likely to make it out alive. Slayers are often a high-risk/high-reward choice, with difficult play styles, looking quite impressive when 'melting' their enemy within seconds, which might also play into dominance-seeking.

Interestingly, we do not see any association of dominance with mages or marksmen, who, like slayers and fighters, have high potential to deal huge amounts of damage. However, both mages and marksmen are low in defense and have few means of escaping if they encounter danger on their own. Their best chance to survive in a normal scenario is staying out of their opponent's range or behind teammates, while relying on them for protection. This might explain why they were not the preferred choice in our sample for those who aim to put other players in their place and 'crush them'.

But What About Gender and Other Factors?

When considering the preference for support, we are aware of the stereotype, that suggests the need to support is stronger in women than in men [47]. We are, however, interested in the underlying motivation, so that we can predict which players like support, irrespective of gender. In the implicit domain, men and women do not differ in the strength of power and achievement motives ([13]; they differ in affiliation only). It would be valuable to test whether gender differences in player preferences are due to gender-specific ways to enact explicit power motives [47], i.e., if gendered ways to strive for power explain gender differences.

Our results should not lead to the conclusion that the power motive can single-handedly explain role preferences in MOBAs. While a substantial amount of variance was explained for some role and champion type choices, there are likely many other factors, also contributing to play styles and

they should be explored in a broader model in the future. However, we argue that the wish to influence other players should not be disregarded when aiming to combine different factors. While our results suggest, that it would be unlikely for the same player to enjoy both, Top Lane and Support or both healers and assassins, there are certainly LoL players out there who do. There might also be elo (player skill level) results involved here. The way that roles and champions are played can differ greatly between different ranks. In higher rankings, Top Lane and Support may have more in common than in lower rankings, for example having to be able to deal with fewer resources or initiating fights in early levels as well as roaming around the map to help others in later stages of the game. In our studies, participants came from all ranks, up to Master tier but the average participant was around Gold level, which can still be characterized as a lower rank.

Aside from player skill level and play style, other factors contributing to the choice of a certain champion or role in a game are likely to include character appearance and difficulty as well as a chosen champion's personality.

Extending into Future Research

It would be interesting if and how dominance might be related to toxicity, which is prevalent in multiplayer online game environments [6, 51]. Because the dominance scale items are focused towards in-game competition and are not related to verbal insults, we can not say how much overlap or shared variance there would be. It has been shown that players of fighters show higher levels of toxicity in League of Legends, while support and tank players are less likely to show toxic behaviour [51]. Together with our results, this raises the question of a link between toxic behaviour and dominant power: the same champion types who are more likely to show toxicity are preferred by players high in dominance and the roles preferred by those who are low in dominance are less prone to show negative behaviour.

It would also be interesting to know how the group high in both dominant and prosocial power, is characterized. Do prosociality and dominance co-exist, meaning prosocial behaviour towards teammates and dominant behaviour towards enemy players? Or does it mean there is a high risk for shifting between these two strategies? If the latter was the case, it would be wise to reinforce prosocial behaviour as strongly as possible to maintain a healthy atmosphere. Another research question to explore would be in how far an explicit prosocial power motive is linked to perceived helpfulness by other players, since there is a difference between feeling the need to help and actually helping.

Implications for Theory and Design

When it comes to research in motivation to play digital games, psychologists and game designers can benefit from one another. On the one hand, games provide a space for motivations to unfold, while being easily observable by researchers. On the other hand, game designers can profit from decades of motivational psychology research when striving to create games in which players of various motivations and personalities can flourish. We recommend keeping in mind that some players have a strong need to influence others, rather than just to play alongside them. Game designers can use a better understanding of the aspects of power motivation by creating mechanics that allow these needs to be fulfilled in ways that also benefit other players. Games could include leaderboards and rewards that emphasize guiding, helping, and mentoring other players as well as positive leadership.

Motivations behind players' avatar choices have been studied [9, 57], but are not well understood. It would be valuable if roles (e.g., supports, damage dealer) were equally attractive to players, so that players could pick what they like, rather than having to fill a position. To make roles equally attractive, we first need to understand why they are attractive for different player types. Individual differences are a valuable lens because if we would all enjoy the same things, we would all want to play the same roles. Motives are a tool to help us understand individual differences in motivation; the power motive is especially worthwhile in the context of games, in which power dynamics are so important.

Limitations

Our work has some limitations, that should be addressed by future work. First, our sample sizes are small when comparing them to the millions of LoL players around the world and regionally limited to German players. Second, we do not know how the properties of roles and champion types interact in shaping playstyle preferences (e.g., players who enjoy a certain role starting to prefer champions which are strong in this role). Further, we can not be sure how and when conscious preferences turn into long-term behaviours or how stable they are over time. Finally, we can not yet conclude whether adopting a playstyle that fits an individual's motivation will guarantee lasting game enjoyment.

CONCLUSION

The power motive can explain why some players have a strong need to make a lasting impression on other players and some do not. We investigated nuanced aspects of this motive, considering the facets of prosociality and dominance in particular. We show how these facets of the need for power can manifest in preferences for roles and champion choices in MOBA games, such as choosing to heal or support other players. People have a need to belong. Our social interactions motivate our behavior in a way that is more diverse than simply wanting to be close to others.

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Chapter 4:

Prepare for Trouble and Make It Double: The Power Motive Predicts Pokémon Choices Based on Apparent Strength

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Prepare for Trouble and Make It Double: The Power Motive Predicts Pokémon Choices Based on Apparent Strength

Susanne Poeller
Department of Psychology, University of Trier, Germany

Karla Waldenmeier
Department of Psychology, University of Trier, Germany

Nicola Baumann
Department of Psychology, University of Trier, Germany

Regan L. Mandryk
Department of Computer Science, University of Saskatchewan, Canada

ABSTRACT

Two social motives are distinguished by Motive Disposition Theory: affiliation and power. Motives orient, select and energize our behaviour, suggesting that the choices of power-motivated individuals should be guided by power cues, such as the appearance of strength in a game character or avatar. In study 1 we demonstrate that participants were more likely to pick strong-looking Pokémon for a fight and cute Pokémon as a companion. In addition, we show that even when considering these contexts, the power motive predicts preferences for a powerful appearance, whereas affiliation does not. In study 2 we replicate the study 1 findings and distinguish between two ways to enact the power motive (prosocial and dominant power). We demonstrate that the dominance, but not the prosociality, facet drives the preference for strong-looking Pokémon. Our findings suggest that the need to influence others—the power motive—drives the choice for battle companions who symbolize strength.

CCS CONCEPTS

• **Human-centered computing**; • **Empirical studies in HCI;**; • **Applied computing**; • **Computer games;**; • **Software and its engineering**; • **Interactive games**;

KEYWORDS

motive disposition theory, power, affiliation, dominance, prosociality, player motivation, gaming, digital games, avatars, digital representation

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1 INTRODUCTION

In digital games, players often face the choice of how they wish to represent themselves. Such choices have implications for how players are then perceived and treated by others; for example, it has been found that attractive avatars are interacted with more frequently [41], as are elaborate avatars when compared to default avatars [2]. Therefore, if a player wants to be treated in a certain way, they have to ensure that they choose the right avatar—by selecting a digital representation with certain characteristics, players can further their own goals for social interaction in the digital world [35]. If they wish to be feared, they might decide to represent themselves with a strong-looking avatar, while if they want to make friends quickly, they might choose a representation that is particularly approachable.

In this paper, we argue that how a person wishes to socially interact with and be perceived by others depends on their differential social motives. When we use the term social motives, we refer to *Motive Disposition Theory* (MDT) [30, 31, 34], describing motives as desired end-states that can be distinguished into explicit (conscious) and implicit (unconscious) motives. Such motives play an especially important role here, because they are known to influence how we wish to present ourselves to others in order to make an impression that we—as an individual—find desirable [9, 20]. The wish to feel connected to other people is a basic psychological need [6]. Therefore, our interest is not in whether or not a player is socially motivated (as all players are socially motivated to some degree), but rather we question what type of social interactions they are seeking. For example, players may wish to feel close to other players, to be seen as unique, to feel secure in being a part of a guild or clan, or might want to impress other players without getting to know them better. Social motives describe individual preferences for specific ways of interacting with others, depending on the person's desired outcome [62].

Motive Disposition Theory describes three key motivations (i.e., affiliation, achievement, power) that orient, select, and energize behaviour: orienting means that a motive increases perception for motive-relevant cues, selecting means that it increases the autobiographical memory for motive-specific experiences, and energizing means that motives are connected to stronger physiological reactions in situations that arouse a motive [31]. Because motivation is closely linked to emotion, both the hope of experiencing positive emotions as well as the fear of experiencing negative emotions can be strong motivators [13, 14]. MDT distinguishes two social motives: affiliation is the need for mutually satisfying relationships on the same level, whereas the need for power is a concern with

wanting to interact vertically with others [31]. A person high in affiliation motivation but low in power motivation might feel uncomfortable in situations in which they have to lead others and make decisions that will upset people that they like. On the other hand, a person high in the power motive but low in affiliation motivation might feel unhappy in a situation where other people like them, but they do not feel superior or respected.

However, two people who are energized by the same motive do not have to act similarly, because there are different ways to enact a certain motive. People with a substantial power motive might seek influence and admiration. This could be achieved for example by being perceived as helpful and supportive (prosocial power), but it could also be achieved by demonstrating strength and superiority, for example by beating opponents in a game (dominant power) [43]. Which enactment strategy is used can depend on how much a person is influenced by social desirability or can be based on their abilities. Therefore, how well someone does something (abilities; for example a high skill level in a video game) or how they can be described (traits; such as extraversion) needs to be distinguished from their underlying motivations (e.g., a basic psychological need or a motive disposition). Motives are not interchangeable with personality traits, individual abilities, or player types.

In-game representations affect how others treat us and motives influence how we want them to treat us, thus motives should predict how we wish to represent ourselves. However, other factors influence digital representation choices as well. Lin & Wang [26] note that in addition to social navigation (developing friendships or building a reputation), factors such as virtual exploration (e.g., creative and unique representations), identity representation (e.g., representing our actual or ideal selves), and context of use (e.g., adjusting to physical surroundings or current events) matter. In this paper, we aim to demonstrate that social motives influence our choices of in-game representations, even considering the context of their use, through two studies.

Using the Pokémon franchise [40] as a game environment, we asked participants to choose Pokémon (animal-like monsters that accompany a player and fight alongside them) based on their appearance, providing them with the context of use (for fighting or as a companion). We hypothesized that players would prefer strong-looking Pokémon for a fighting context, and that power-motivated players would prefer strong-looking Pokémon in general, as they would wish to be represented with game companions that appear to command respect. Our findings confirm that appearance choices are influenced by the context in which they are made, which is in line with previous findings [26, 54]: specifically, we show that players choose stronger-looking Pokémon when assuming they will use them in a battle and cuter Pokémon when they are asked to choose a companion. Importantly, we also confirm that even when considering context, the explicit power motive predicts choices for strong-looking Pokémon, whereas the affiliation motive does not. In a second study, we replicate these findings, but also differentiate two facets of power (prosocial and dominant power) and learn that a dominant enactment style of the power motive is what ultimately predicts the choice for strong-looking and less cute Pokémon.

Our work applies an individualized view on social motivations. Rather than questioning whether a player is social, we use motive dispositions to understand what players want their social interactions to be like, judging by the digital companions that they choose for use in a gaming environment. Power-motivated individuals show a preference for strong-looking Pokémon, especially if they self-report that they apply a dominant behavioural style. We argue that it is valuable to open the perspective on motivation to new theories in order to understand individual players better. Games user researchers must distinguish underlying motivations that drive behaviour from observed traits (e.g., extraversion) or abilities (e.g., high skill level), in order to accurately predict player behaviours. Game designers understand the importance of creating games that motivate players by satisfying their basic psychological needs, such as the need to belong [6]. However, moving forward, we also need to deepen our understanding of human motivation and pay respect to the motivational and experiential differences between players in order to provide them with features and representations that meet their individual needs.

2 BACKGROUND

2.1 Motives

We use the term *motive* as a personality disposition for an individual, which refers to experiential preferences that come to be infused with emotion [28]. Thus, motives are end-states that are desirable to an individual. As an example, for one person it might be desirable to become a great leader, while the same can be less interesting for someone else. We draw our theoretical framework from Motive Disposition Theory (MDT) [31, 34, 44], a theory that describes three basic motives (the *big three*), i.e., *affiliation, achievement, and power.* The affiliation motive is a concern over establishing, maintaining or restoring positive affective relationships [8]. The achievement motive is a striving for efficient problem-solving and reaching high standards of excellence while doing so [32]. Finally, the power motive has been described as the wish to exert influence over others [31].

According to MDT, all motives can be measured on an explicit (conscious) and implicit (unconscious) level. Conscious or explicit motives are cognitively elaborated ideas about an individual's goals and closely connected to the idea of values [30]. Unconscious or *implicit motives* predict spontaneous and long-term behaviour and are closely connected to experience [34]. Consider, for example, the wish to be a leader: the explicit power motive characterizes people who like the idea of being a leader and predicts short-term behaviours that reinforce this value (e.g., taking the lead when there is an opportunity to do so). The implicit power motive, in contrast, characterizes the enjoyment people experience when leading others and predicts their long-term behaviours related to leadership (e.g., managerial success; [33]). As a result, explicit motives are likely to be more relevant when predicting structured choices that players make in a given situation (i.e., choosing between alternatives), whereas implicit motives are relevant when aiming to understand long-term behaviours and preferences [34].

2.1.1 *Social Motives: the Difference Between Power and Affiliation.*

Both power and affiliation are social motives, whereas achievement is mostly task- and self-oriented. However, all motives as described by MDT are social, when comparing them to physiological motives such as hunger or sleep. While affiliation is a communal motive,

power is described as an agentic motive [63]. The affiliation motive, which is connected to the desire to belong and be accepted by a group, can be described as having horizontal relationships (on the same level). A preference for vertical relationships, on the other hand, is attributed to the power motive, as this is associated with striving to influence others [31, 56]. In social situations, people high in the affiliation motive aspire to harmonious integration into a group [22], whereas those motivated by power would accept conflicts in order to take up leading positions in the social hierarchy. People high in affiliation show pleasant nonverbal behaviour towards opponents in competitive matches [55] and a better memory for communal episodes [61]. In contrast, individuals high in power are sensitive to criticism, are more likely to seek contact with easily influenced people, and use more verbal persuasive behaviour [16, 51]. Although both motives include interactions with other people, these interactions manifest in different ways.

2.1.2 Facets of Social Motives. While researchers' opinions might vary in what classifies as an additional motive beyond the big three (for example the autonomy motive [1, 3]), there is wide agreement that there is value in further differentiating behavioural styles for each motive. As an example, McClelland discussed fear-based variations of all 'big three' motives (*fear of rejection* for affiliation, *fear of failure* for achievement, and *fear of weakness* for power) [31] and he also acknowledged finer distinctions within the power motive, namely the *socialized* (prosocial) and the *personalized* (dominant) variant of the power motive [29]. In this spirit, the big three motives can be understood as broad categories that allow for a more detailed view when broken down into their enactment styles [5]. In games research, this faceted view has been previously employed to show that prosocial and dominant power can lead to diverging predictions of playstyle preferences, when working with explicit motives [43].

At first glance, the idea that prosocial and dominant behaviour indicate different ways to enact the same motive might seem unlikely but both are concerned with influencing others. When dominance-seeking individuals are not being challenged, they might act prosocially and help someone in order to gain status, rather than by putting others in their place. Additionally, when we are looking at cognitively elaborated (explicit) motives, that are influenced by social desirability [37], some people might inhibit less socially desirable tendencies (like dominance) more than others. As a result, distinguishing between facets should lead to finer predictions of behaviour. Nonetheless, we have to keep in mind that dominant behaviour in games can be socially desirable, as crushing the enemy is the goal of many games and players who are good at doing so achieve higher rankings on leaderboards (status) and will more likely be recognized by others.

2.1.3 Player Motivation Scales and Player Type Measures. This is not the first attempt to predict game choices by differential motivations. As such, the use or application of another theory should be justified and compared to other models. MDT is different from such scales of player types and player motivation (e.g., [19, 23, 38, 65]) in two ways: First, the theory acknowledges two different types of social motivation (power and affiliation) that underlie social behaviours (paying respect to the understanding that social interactions are a complex and strong driving force for human beings). Second, instead of describing a behavioural outcome and assuming an underlying motivation, MDT is concerned with the process of *why* and *how* motives shape behaviour. To give an example, the Digital Games Motivation Scale (DGMS) [19] aims to assess motivation by asking players how likely it is that they would engage in certain activities in a game and then concludes that a player must be motivated for the behaviour, because the player reported it. However, without validating the process of how such motivations connect to behaviour through perception, emotion, or physiology, the DGMS represents self-reported behaviour (e.g., "if you were to play games in the near future, how likely is it that you get far in the game?") rather than what motivates that behaviour. A 35-year-old quote from David C. McClelland, the founder of Motive Disposition Theory, serves to explain why simply inferring motivations from behaviour can be problematic: *"Most people tend to explain everything others do in terms of motives invented on the spot. Psychologists studying personality have progressed way beyond this 'naming fallacy' by identifying a limited list of key human motives and generally distinguishing them from other personal characteristics such as traits and abilities"* (David C. McClelland,[31] S. 64). The emphasis here is on how an individual's abilities or traits are distinct from what drives them. Furthermore, MDT elaborates how motives *orient, select, and energize* behaviour, as we now describe.

2.2 Motives Orient, Select and Energize Behaviour

Motives serve to direct, select, and drive behaviour and experience [28, 31]. This can be seen within a context of opportunities and constraints depending on the environment that an individual is situated in [28].

2.2.1 How the Power Motive Orients, Selects and Energizes. Individuals high in power motivation have shown a higher sensitivity to power-related stimuli—an indication for the ***orienting*** or directing function of the power motive [31]. The perceptions of power-motivated individuals are susceptible to power cues, meaning that they should be more likely to perceive the game environment as a means to gain influence. For example, when confronted with a given leaderboard, power-motivated players should be intrigued by it and perceive it as an opportunity to gain status.

When mentioning the ***selective*** function of power, McClelland [31] explained that power-motivated individuals recall more experiences of great emotional importance that they describe in power terms. Other researchers have followed up on this and have shown that motive dispositions change how autobiographical memories are encoded [63, 64]. Translating this into a game context, it should mean that power-motivated players experience and remember stronger emotions during play when they feel either powerful (positive affect) or powerless (negative affect) as compared to players who are not driven by a power motive.

The ***energizing*** or driving function of the power motive, relates to physiological outcomes of different situations. Researchers have demonstrated that power contexts are related to epinephrine and norepinephrine excretion for power-motivated individuals [31] as well as the release of stress hormones, such as cortisol and norepinephrine in situations of dominance challenges or social defeat [49]. In a game, this should mean that power situations, such

as a competition or dominance challenge between players, should result in a stronger physiological reaction of a power-motivated individual, which should lead to a drive of the power-motivated individual to invest more time and effort into these situations.

To summarize, motives shape motive-relevant behaviour in three ways: They 1) lead to an increased perceptive readiness for motive-specific cues (orienting function), 2) are connected to a stronger memory for motive-specific experiences (selective function), and 3) result in a stronger physiological response in motive-relevant situations (energizing function).

2.2.2 Self-Determination Theory and Motive Disposition Theory. A theory of motivation that is well known and frequently used in the field of Human-Computer Interaction and games research specifically is Self-Determination Theory (SDT) [10, 46, 53]. The main difference between both of these motivational theories is that SDT is concerned with universal needs that all humans share. MDT on the other hand, is concerned with individual needs that are differentially pronounced in different people and can be used to describe interindividual differences in motivation. As we were not interested in main effects, such as what the majority of players prefers, but rather in differential choices, depending on individual motivations, we turned to MDT.

2.2.3 The Power Motive Facets and In-Game Choices. It has recently been shown, that in a Multiplayer Online Battle Arena (MOBA) game, the explicit power motive predicts playstyle preferences, when distinguishing between people who enact their power motive prosocially or dominantly [43]. However, self-reporting playstyle preferences is not necessarily the same as making a choice between available options. For example, a player might describe a champion or avatar on multiple dimensions, such as playstyle (e.g., melee vs. ranged), difficulty (e.g., easy to play vs. hard to play), appearance (e.g., tall vs. small), and other special properties (e.g., a specific liking for fire magic). Even if a champion has the right playstyle, there might be something else they do not like about it (such as that the character might be evil), which would prevent them from choosing it. Therefore, playstyle preferences alone might not always be enough to predict choices. To work towards being able to predict choices more precisely in the future, we focus on only one dimension, namely appearance.

2.3 Appearance Choices in Games

2.3.1 Choosing In-Game Representations Based on Appearance. When it comes to explaining in-game appearance choices, research has focused on the representation of the players themselves, showing for example that players tend to create their avatars similar to themselves but more attractive [36]. However, many multiplayer gamers do not have only one representation, but rather create multiple in-game representations of themselves and these multiple representations of one player often have different characteristics or value [27], including a different appearance [26]. Lin & Wang [26] have identified a number of factors that independently influence the avatar creation process. These include for example the factors of social navigation (creating a character that emphasizes on how the player wants to interact with other players) and identity representation (how does a player want to be representing their identity in a virtual world). Both of these factors might be influenced by desired end-states such as explicit motives. Lin & Wang also identified other factors, which are likely more independent from social motives such as virtual exploration (related to uniqueness, creativity and immersion in the character creation process) and contextual adaptation (e.g., creating a character that fits the virtual environment). Thus, researchers have identified multiple determinants of avatar choices. In turn, the representations of a player that are given, chosen, or created then shape the player's behaviour and experience. Not only might players choose representations that further their own goals within the virtual world [35] and fit the context that they are created in [54], but depending on the appearance of their avatar, they will adjust their behaviour [2, 21, 35] as well as be treated differently by others [2, 41]. This is not surprising as even in the physical world, where people cannot choose their own features, people tend to make judgments about personality [25, 42] or leadership quality [25] based on appearance.

2.3.2 The World of Pokémon. As a game environment, we chose the world of the Pokémon franchise [40] that started in the year 1996 and became popular featuring a number of video games as well as a 23-season TV series and 21 movies. In the TV series as well as the games, trainers catch animal-like monsters, (the Pokémon) and train them to use them in fights versus other trainers. As of 2019, there are currently 890 different species of Pokémon. Part of the nature of games like Pokémon is that the creatures that are collected by the players can be seen as a representative of the player while they allow for social interaction with battle opponents (for example other players) [47]. When choosing a Pokémon, players should make choices that reflect their motive dispositions.

2.4 Hypotheses

If players have no further information about a Pokémon, they should make their Pokémon choices based on appearance alone. Specifically, we are interested in showing how power-motivated players select Pokémon. We assume that these choices will be different from the choices that other types of socially motivated players (affiliation-motivated players) make.

We assume that power-motivated individuals see strength as a desired trait, as it allows for being respected (status) or feared (dominance), but also a certain amount of strength is needed to be helpful (prosociality). From a theoretical perspective, the power motive makes power-cues, such as a powerful appearance, more salient to power-motivated players (orienting function of the motive) and leads to them anticipating positive affect when feeling strong, due to selective recall of strong emotions in power contexts (selective function of the motive). If people are not power-motivated, they should be choosing Pokémon based on other factors, such as context.

This led us to the following three hypotheses:

1. Players should prefer picking strong Pokémon over cute Pokémon, when they are assuming to use them in a fight with others.
2. Power-motivated individuals should always prefer powerful-looking Pokémon to other Pokémon appearances, regardless of context.
3. Affiliation-motivated individuals should not be affected by a strong Pokémon appearance when making their choices.

We test these hypotheses in our first study and add an additional research question in study 2, where we replicate findings from study 1 but also explore whether two different facets of power (i.e., dominance and prosociality) predict choices of Pokémon depending on how powerful they look in the same way (additive effects) or differently. In study 2, we also add the question of whether or not players automatically assume a fighting context for Pokémon choices when no specific context is given.

3 STUDY 1

3.1 Method

3.1.1 Initial Pokémon Ratings. We wanted participants' choices to be guided by the appearance of the Pokémon rather than its fighting abilities, thus we chose the 7th generation (Sun & Moon) [17] because it had the most recently released Pokémon (at the time of the study in November 2019), reducing the chance of familiarity with these Pokémon among participants. To categorize the 88 Pokémon by appearance, 14 raters (psychology students) were asked to indicate whether each of them was either a) cute b) strong-looking or c) neither/neutral (forced-choice between the categories). Pokémon with an agreement between at least 10 out of 14 raters were considered, leaving 53 Pokémon (16 cute, 20 strong, 17 neutral). 15 Pokémon of each category were then chosen and presented in triads of three Pokémon each, i.e., one Pokémon from each category of cute, strong, and neutral.

3.1.2 Participants and Procedure. The sample for the main study consisted of 109 students at the University of Trier, Germany (mean age=21.55, SD=4.03; men=28, women=81, non-binary=0), who were rewarded for their participation with course credit. Because the release of the 7th generation of Pokémon was three years prior to the study, we double-checked that the experience level of our participants with it was still low. Only few participants reported having some (N=7) or a lot (N=5) of experience with the 7th generation of Pokémon. We ran all analyses both including and excluding them; as results did not differ, these participants were included.

When participants arrived in the lab, explicit motives were assessed using paper-based surveys. Participants were randomly assigned to an experimental condition and presented with the pictures of the Pokémon on a computer screen. Demographic variables and Pokémon experience were collected at the end of the study.

3.1.3 Measures and Analyses.

Explicit Power Motive

For the measurement of the explicit power and affiliation motive, we used the general power and affiliation scales of the Motive Enactment Test (MET) [24, 48]. Each scale consists of 4 items. For every item, participants had to rate to what extent the statements applied to them by using a 4 point-Likert-scale. An example item for the power motive scale is "Other people often prefer me to be the leader" and for the affiliation motive scale "I enjoy talking with nice people about all sorts of topics".

Fight vs. Companion Condition

Participants were assigned to one of two conditions: the fight or the companion condition. The instruction "Which Pokémon would you choose for a fight with a friend?" vs. "Which Pokémon would you choose as a companion?" was presented along with each Pokémon triad.

Pokémon Choices

For each trial, the participants were confronted with pictures of one cute, one strong and one neutral Pokémon next to each other (for an example see Figure 1). The arrangement of the three Pokémon was randomized between trials, but was the same for all participants. The experiment consisted of 15 triads. Participants were asked to choose one Pokémon from each triad and to note their choice on a sheet of paper by using the letter that was allocated to the Pokémon.

The data analyses were performed using SPSS Statistics 25. We report a multiple regression for each explicit motive (power and affiliation). In block 1 of each regression we added the condition in order to check whether the context in which a Pokémon is picked matters. In block 2, we include the explicit motive (power in analysis 1 and affiliation in analysis 2) in order to understand whether motive dispositions influence Pokémon choices beyond the context for which a Pokémon is selected. As the dependent variable, we use a differential value of the number of Pokémon from each category that the participant has selected. Theoretically, power-motivated individuals should prefer Pokémon that are strong-looking and not cute, so the differential value was calculated from the number of strong-looking Pokémon that the participant had selected minus the number of cute Pokémon that were selected. In order to verify this approach, all analyses were repeated when using only the number of strong-looking Pokémon selected or the number of cute Pokémon selected by a participant as a dependent variable instead and for all cases, our results remained robust (inversely for cute Pokémon).

3.2 Results

Descriptive Statistics

For the two explicit motive scales, we observed the following descriptive statistics in our first study: MET Power (Mean=2.31, SD=.46) and Affiliation (Mean=3.23, SD=.56). The number of Pokémon picked from each type (15 triads) was highest for strong-looking (Mean=6.14, SD=4.53) second highest for cute (Mean=5.38, SD=4.46), and lowest for neutral (Mean=3.46, SD=2.43) Pokémon.

Multiple Regressions

All results from the multiple regression analysis are displayed in Table 1.

The context significantly predicted the Pokémon type that was selected, showing that in the companion condition, participants were more likely to pick cute Pokémon, while in the fight condition, participants overall preferred strong-looking Pokémon. The condition accounted for 11.8% of variance.

Additionally, even when looking at both the context and the individual power motive together, the power motive significantly explained 4.6% of additional variance, showing that irrespective of the context, power-motivated individuals prefer strong-looking Pokémon to cute Pokémon.

The affiliation motive did not significantly predict any preference for cute or strong-looking Pokémon.

Figure 1: An example for a triad of Pokémon that was presented together in study 1. A) represents a cute Pokémon, B) a strong-looking Pokémon and, C) a neutral Pokémon.

3.3 Brief Discussion

This exploratory study indicates that participants are more likely to choose strong-looking Pokémon for a fight and cute Pokémon as their companion. However, power-motivated individuals tend to prefer strong-looking Pokémon to cute Pokémon in both contexts. The affiliation motive did not predict a preference for Pokémon depending on a powerful appearance. These findings support our hypothesis that there are different types of social players that do not share the same preferences. The question of how robust this effect is remains open. Additionally in some Pokémon games, the context (fight vs. companion) can be mixed, as for example in the popular augmented reality game Pokémon Go [39], players can choose a Pokémon as their buddy, which will be displayed next to them and is visible to friends. The buddy can assist the player by finding items or helping them to catch other Pokémon and their type or strength does not matter here. However, when the player evolves their friendship with a buddy to the maximum level, the Pokémon will also become stronger in fighting conditions. Therefore, we decided to conduct a second study, aiming to replicate the results from study 1 but also including a third condition, in which no clear context is given to participants who are asked to choose Pokémon, testing the hypothesis that when no context is determined, the fighting context will most likely be assumed by participants. Since there are different enactment styles of power [29, 43, 52], depending on what type of vertical interaction with others people hope for (e.g., helping vs. dominating others), we also decided to measure sub-facets of the power motive (as has been done before [43]), to understand what drives the effect.

Table 1: Multiple regression results for study 1. Significant results displayed in bold: *p<.05; **p<.01. Table represents two separate regressions, predicting a preference for strong-looking Pokémon.

	Regression 1: **Power**	*Regression 2:* **Affiliation**
Block 1: **Condition**	R^2 = **.118**** β = **.343**** B = 2.957 T = 3.780 Lower CI: 1.406 Upper CI: 4.507	
Block 2: **Explicit Motive**	ΔR^2 = **.046*** β = **.214*** B = 3.992 T = 2.40 Lower CI: .700 Upper CI: 7.284	ΔR^2 = .001 β = -.024 B = -.366 T = -.260 Lower CI: -3.153 Upper CI: 2.422

4 STUDY 2

4.1 Method

4.1.1 Initial Pokémon Ratings. When study 2 was conducted (May 2020), the 7th generation was no longer the most recent Pokémon release. We therefore assumed that participants would be least familiar with the new 8th generation (Sword & Shield) [18]. We adjusted the rating-process of the Pokémon that we had used in pre-study 1, in order to check whether there was overlap between dimensions. First, rather than asking the participants to sort each Pokémon into a category (as was done in pre-study 1), we asked them to rate Pokémon on different dimensions on 5-point-Likert scales as to what extent each description fit the Pokémon (from 1 = "not at all" to 5 = "very"). In total, 10 raters rated 83 Pokémon from the 8th generation. A Pearson-correlation revealed that there was a strong negative correlation (r= -.78) between the Pokémon's rating of being strong and cute, indicating Pokémon who were rated as cute were often rated as less strong. The only Pokémon rating moderately high on both dimensions was Toxel, who was thus excluded from the study. We chose 36 Pokémon who either had a high rating for a) cute only b) strong-looking only or c) neither of these two dimensions. As in study 1, Pokémon were presented in

triads, featuring one each of a strong-looking, a cute, and a neither strong nor cute Pokémon, resulting in a total of 12 triads.

4.1.2 Participants and Procedure. 158 students of the University of Trier, Germany (mean age=22.89, SD= 4.33; men=45, women=113, non-binary=0), volunteered to participate in the study, receiving course credit for their participation. Study 2 was an online study and participants were provided with a questback [45] survey link, from which they could participate. Participants first filled out the questionnaires for explicit motives. Next, they made their Pokémon choices, and finally they completed the demographic surveys and Pokémon experience questions.

4.1.3 Measures and Analyses.

Explicit Power Motive

As in study 1, we used the general power and affiliation scale of the MET [24, 48] to investigate explicit power and affiliation motives. To examine different power motive types, we additionally used a questionnaire that differentiates between facets of power [43]. We measured prosocial power (i.e., a focus on helping others in games; e.g., "I enjoy assisting other players when they need help") and dominant power (i.e., a focus on dominating others in games; e.g., "When other players challenge me, I want to put them in their place"). Each facet was measured with 3 items. Participants were asked to indicate on a 5-point-Likert scale ranging from "do not agree at all" to "completely agree" to what extent the statements apply to them when they play video games.

Fight vs. Companion vs. Neutral Condition

In contrast to study 1, we added a neutral condition, in order to understand whether participants would assume a context if it was not given. Thus, participants were randomly assigned to one of three conditions: fight ("Choose a Pokémon for a fight"), companion ("Choose a Pokémon as a companion"), or neutral ("Choose a Pokémon"). The instruction was presented once before participants made their Pokémon choices.

Pokémon Choices

Participants saw 12 triads of one cute, one strong, and one neither strong-looking nor cute Pokémon and were asked to choose one. The Pokémon were arranged side-by-side and the arrangement was randomized between trials but was the same for all participants. The order of the 12 triads was randomized.

The analyses were performed using SPSS Statistics 25. We report multiple regressions. As the condition was a categorical variable that was not dichotomous, we chose two contrasts. Contrast 1 compared the companion with the fighting condition, as was done in study 1. Contrast 2 compared the neutral condition to the companion condition. We chose this second contrast based on the theoretical assumption that Pokémon is a fighting game and therefore participants would most likely assume a fighting situation in the neutral scenario; Based on the game context, we assumed that the neutral condition would be more comparable to the fighting condition than the companion condition.

As in study 1, we performed multiple regression analyses looking at context in block 1 and motive dispositions in block 2. We replicate the results of study 1 and add one analysis, adding the power motive facets (prosocial and dominant power) in block 2 in order to understand which enactment style makes the prediction.

Considering the strong negative correlation between the preratings for Pokémon as being strong-looking or cute, we again calculate a differential value of strong-looking minus cute Pokémon, as it has been done in study 1, and use it as the dependent variable for all analyses.

4.2 Results

Descriptive Statistics

For the four explicit motive scales, we observed the following descriptive statistics in our second study: MET Power (Mean=2.38, SD=.53) and Affiliation (Mean=3.16, SD=.59). Prosociality (Mean=3.96, SD=.57) and Dominance (Mean=3.1, SD=.96). The number of Pokémon picked from each type (12 triads) was descriptively highest for cute (Mean=4.77, SD=3.26), second highest for strong-looking (Mean=4.08, SD=3.21) and lowest for neutral Pokémon (Mean=3.15, SD=2.06).

Multiple Regressions

All results from study 2 are displayed in Table 2. For the experimental conditions, we replicate the findings from study 1. Contrast 1, comparing the companion to the fight condition, shows that stronger-looking Pokémon were more likely to be picked in the fight condition. However, the effect is less strong than in study 1. Contrast 2 shows that when comparing the neutral rather than the fight condition to the companion condition, participants were not more or less likely to choose strong-looking Pokémon in the neutral condition as opposed to the companion condition, indicating that when no context is given, participants do not seem to automatically assume a fighting context. In study 2, both contrasts explain 2.8% of variance together.

The results for motive dispositions show that the general explicit power motive significantly predicts the choice of strong-looking Pokémon over cute Pokémon, explaining 7.4% of variance, which is comparable to the effect that was found in study 1. As in study 1, the second analysis showed that again, the general explicit affiliation motive did not predict choices for strong-looking or cute Pokémon beyond context.

When investigating which power motive style predicts choices for strong Pokémon, we find that dominance drives this effect. The two power motive facets prosociality and dominance explain an additional 17.3% of variance together but only dominance significantly predicts a preference for a strong appearance of Pokémon.

The results suggest that when judging Pokémon by how cute vs. strong they look, individuals will not make their choice based on the affiliation motive, whereas power-motivated individuals (specifically dominance-motivated individuals) are more likely to prefer strong-looking Pokémon irrespective of the context.

4.3 Brief Discussion

First, we did not find the contrasts of the conditions fight vs. companion to be comparable to the contrast neutral vs. companion, indicating that participants did not automatically assume a fighting

Table 2: Multiple regression results for study 2. Significant results displayed in bold: *p<.05; **p<.01. Table represents three separate regressions, predicting a preference for strong-looking Pokémon.

	Regression 1: **Power**	*Regression 2:* **Affiliation**	*Regression 3:* **Prosociality**	**Dominance**
Block 1:	*C1 Fight (vs. Companion)*		*C2 Neutral (vs. Companion)*	
Condition	β = **.330***		β = -.251	
	B = 2.462		B = -2.154	
R^2 = .028	T = 2.064		T = -1.569	
	Lower CI: .106		Lower CI: -4.866	
	Upper CI: 4.817		Upper CI: .558	
	ΔR^2 = **.074****	ΔR^2 = .006	ΔR^2 = **.173****	
Block 2:	β = **.275****	β = -.075	β = -.086	β = **.407****
Explicit	B = .794	B = -.193	B = -.306	B = .867
Motive	T = 3.567	T = -.941	T = -1.179	T = 5.609
	Lower CI: .354	Lower CI: -.598	Lower CI: -.818	Lower CI: .562
	Upper CI: 1.234	Upper CI: .212	Upper CI: .207	Upper CI: 1.172

context, when no specific context was mentioned. Second, we replicated our findings from study 1, showing that the context in which Pokémon are chosen matters, as more strong-looking Pokémon were chosen in the fight condition than in the companion condition. However, the effect of context was less strong than in study 1, possibly because the (manipulated) instruction had only been presented once in study 2, while it had been presented alongside each triad in study 1. We also replicate our finding that only the power motive can predict Pokémon choices based on how strong a Pokémon looks, whereas affiliation-motivated individuals show a preference for neither strong nor cute Pokémon. This can be seen as an indication that power- and affiliation-motivated individuals, though both types of social players, are not equally concerned with the same appearance dimension (strength). Finally, study 2 allows for insight on the enactment of the power motive, as only the dominance facet of power was associated with a preference for Pokémon with a powerful appearance. Although a player might need to be strong in order to be able to help others (prosociality), our results suggest that only in order to dominate others, strength might be the crucial factor and to appear intimidating, strong-looking Pokémon might be key. People might look for trustworthiness and competence rather than for raw strength when turning to other players for help; therefore, the way that the Pokémon were pre-selected for our studies was a reflection of dominance rather than prosocial characteristics. Overall, this is an indication that choices in games can be predicted more accurately when applying a nuanced view on motives and how players seek to enact them.

5 GENERAL DISCUSSION

The contributions of our paper are 1) we provide additional (replication) evidence that there are two distinct social motives relevant to games; 2) we show that these two social motives differentially affect character choices in a specific gaming context; and 3) we demonstrate that the facets of the power motive differentially predict choices in a gaming context. We use the Pokémon universe as an example to explain how Motive Disposition Theory (MDT) can be applied, but we acknowledge that future work is still needed to establish how MDT interacts with other theories and how it can be used in other specific gaming contexts. Our research should be taken as an encouragement to other researchers to differentiate social motivation into multiple types when aiming to understand player choices. Additionally, we extended on the work of other researchers who aimed to understand avatar choices by proposing theoretical explanations for avatar choice and an example of how MDT fits into existing frameworks.

5.1 Summary of Results

In study 1, we show that:

- The context in which a decision is made predicts Pokémon choices
- The power motive predicts choices for a strong appearance, whereas the affiliation motive does not

In study 2, we:

- Replicate all findings from study 1
- Show that a fighting context is not automatically assumed, when no context is given
- Demonstrate that only the dominance facet of the power motive (but not the prosocial facet) drives the effect of a preference for strong Pokémon

5.2 The Role of Context

Previous research has shown that the context of avatar creation affects how they are created. For example, avatars for dating are likely to be designed as a more attractive version of oneself [54]. This seems highly adaptive when aiming to find friends or companions, as other researchers have demonstrated that attractive avatars are more likely to be interacted with [41]. Equally, it seems logical for our participants to choose Pokémon with a powerful appearance when anticipating sending them into a Pokémon battle, as it was the case in both of our studies. On the other hand, when it was anticipated to use a Pokémon as a companion that will accompany the player (as for example the buddy Pokémon in Pokémon GO), there is a good chance that players would choose

a cuter Pokémon. With this result, we also have to keep in mind that most of our participants identified as women and so it is possible that gender stereotypes play a role as well, when choosing a companion Pokémon. There have been some differences in motive expression found between men and women (e.g., [11, 58]). There is, however, no evidence that if an individual is strongly influenced by a motive, it leads to differential appearance preferences based on gender (e.g., that power-motivated women would like cute Pokémon but power-motivated men would not), thus our research does not centre gender in the analysis. We focus on the underlying forces that might express as observed gender differences, rather than simply describing differences and attributing them indiscriminately to gender itself. The underlying motives may relate to gender, but are not driven by gender identity.

When no context is given, there seems to be no clear indication of what context is assumed. We found no predictions for strong or cute Pokémon choices when only asking participants to choose Pokémon without telling them specifically what for. Our assumption was that with a game environment like Pokémon, the fighting context might be inherently assumed. However, this does not seem to be the case as Pokémon in the neutral condition were not selected differently from the companion condition in study 2, while participants in the fight and companion condition differed in their choices. We also demonstrate that context is not the only factor that determines choices, even if it is a significant factor. It seems that context is indeed a separate dimension when it comes to appearance choices, as it was proposed by the framework of Lin & Wang [26]. When a clear context is made salient, the majority of participants seems to include it into their decision but when no context is specified it is likely that only some participants will assume a context and choose based on that. Many participants might just make their choice based on one of the other dimensions.

5.3 Distinguishing Between Different Types of Social Motives

We also argued that it is valuable to not simply classify players as being either social or not social. Many player type scales do in fact make somewhat finer distinctions between affiliation and power type motivations [23, 38, 65]; however, in almost all cases the affiliation-oriented subscales are labelled social, socializer, or socializing, while the power type motivations are likely to be labelled as competitive or competition. The labelling of these scales leaves the impression that competitive players are not social even though power motivation also correlates with, for example, extraversion [15, 44]. This is because personality traits such as the Big Five describe people, whereas motivations should explain what leads to people being the way that they are. Power-motivated individuals should frequently be found in social interactions, even though there might be an ulterior motive involved. Both the BrainHex Socializer [38] scale as well as the DGMS Social [19] scale have even been found to correlate with the explicit power motive but not with the explicit affiliation motive [44]. A reason for this might be that many games are power contexts, in which competition is prevalent, so power-motivated players might feel more comfortable in social in-game interactions than affiliation-motivated players. As a result, we argue that careful theoretical distinctions should be made when creating a scale measuring social player motivations and that broad labels, such as 'social', can be misleading. Power motivation plays an important role in gaming; as many games are about winning, there are status symbols such as achievements, leaderboards, or prestigious items prevalent in games, and players can often gain admiration from being a good team, guild, or clan leader. This results in complex power structures in some multiplayer games, which go way beyond just wanting to compete. Consequently, players should be distinguished by whether they are mainly looking for harmonious friendship and companionship on the same level or vertical interactions. Our studies show that the two social motives were not equally associated with Pokémon choices, indicating that they are indeed distinct; however, our focus was on the power motive and not how affiliation-motivated individuals would choose.

That the affiliation motive did not at all predict a preference for strong-looking vs. cute Pokémon does not mean that affiliation-motivated individuals are not influenced by appearance. It mainly shows that when they pick their Pokémon they might be looking at other dimensions than how powerful it looks. Theoretically, power-motivated individuals, especially those who are seeking to dominate others, would aim to intimidate others with a strong appearance and in games, this means they might look for appearances (or companions) that help them establish this image. Affiliation-motivated individuals might care less about a strong appearance and more about how approachable they are. They might strive for a friendly, warm, interesting, or attractive appearance and in this study, such participants might have found Pokémon with traits of their choice in all three categories (strong, cute, neutral). This would also be in line with previous research showing that players are more often approached in games when they have an attractive appearance [2, 41]. In the physical world, people are more likely to be interpreted as extraverted, open to experience, and agreeable when they smile frequently [42], which confirms that a pleasant and friendly appearance might be a good choice for affiliation-motivated players.

5.4 The Power Motive and Appearance Choices

We show that the power motive is associated with a choice for strong-looking rather than cute Pokémon. Our results remained significant when only considering the number of cute Pokémon chosen (inversely) or the number of strong-looking Pokémon chosen. Additionally, we observed a strong negative correlation between Pokémon being rated as cute or strong in our second pre-study. As a result, we treat cuteness as the opposite pole of the strength dimension in our work. While in fact the opposite pole of the strength dimension should be weakness, it seems that there is a clear overlap between Pokémon being rated as weak or cute, leaving the impression that cute is simply a more favourable description of weakness. Because of this overlap, it is apparent why power-motivated individuals seem to rather avoid cute Pokémon, as they would not want to be perceived as weak as a side-effect of training cute Pokémon. That this preference for strong-looking Pokémon is robust, especially when the power motive is enacted with a dominant behavioural style (as we can see from the results in study 2) is easily explainable. While for some players there might be a challenge in beating their opponent with an especially harmless looking Pokémon, in general, dominance-motivated players should want to appear as

intimidating as possible and that would include the pet, monster, or demon that fights by their side. Traditionally, the power motive has been studied in relationship to politicians and leadership quality [4, 33, 57, 59], and while not every power-motivated individual might strive to lead or guide others, a certain appearance is instrumental when striving for a power position [25].

5.4.1 Are Dominance-Motivated Players Troublemakers? This might lead to the question of whether a dominance motive is connected to problematic behaviour in games. "Prepare for trouble! And make it double!" is a catchphrase from the Pokémon animated TV series that the antagonists Jessie and James, both members of the evil Team Rocket, use to introduce themselves. Jessie and James consistently strive to capture powerful Pokémon. Are dominance-motivated individuals out to "denounce the evils of truth and love" and extend their "reach to the stars above" like Team Rocket and choose Pokémon to help them cause trouble? While this would be a stretch, there are a number of studies that link the implicit personalized (dominant) power motive to unfavourable impulses such as heavy drinking, fast driving, gambling, collecting prestige items as well as somewhat following the "law of the jungle" [29]. Another study has recently linked the dominant facet of the explicit power motive to a preference for playing those roles in League of Legends [43] that have previously been associated with the highest toxicity levels in the game [50]. However, the mechanisms of this relationship are not clear and have not yet been studied in a games context. Additionally, dominant behaviour in games is not necessarily socially undesirable, because winning a fight in a game is generally connected to status. This might raise the future research question of how appearance choices could be one possible indicator of a player being more likely to show negative behaviour in a game.

5.5 Related Constructs and Theories

Another valuable future direction would be to link the effects of motive dispositions on appearance choices to other research in this area. We know that players have various reasons for selecting in-game representations, which include that they might want it to fit the context of the game or to be a unique creation as well as wanting it to fit the social goals they want to achieve in the game or represent what an individual believes to be their ideal representation [26]. Our results could be interpreted in a way that when no motive is aroused in the given situation, players possibly choose based on context. Explicit motives, which are closely connected to the values of a player, might also be related to what the ideal representation is for each player. For one person an ideal representation might be strong but for someone else it might be friendly, meaning that an ideal representation is very likely subjective at least to some extent. It has been noted that diversions between the actual and the ideal self in character creation are dependent on the well-being of the player [7]. This raises the question if avoidance tendencies within a motive [12] (which are generally linked to lower levels of well-being [14, 60] and self-esteem [44]) might be strongly connected to a choice for an ideal and motive-congruent representation.

5.6 Future Work

Due to the complexity of Motive Disposition Theory, it is common to focus on a certain motive at a time. Additionally, motives have to be aroused in order for motive-relevant behaviour to be observed [31]: In our work, we have presented a power-relevant cue (strength vs. cuteness) to participants but not an affiliation-relevant cue and therefore we focused on the power motive. In future work, affiliation-relevant cues should be used, to understand the appearance choices of players with other social motivations in more detail. Additionally, it has yet to be shown that preferences regarding a strong vs. cute appearance apply to human avatar choices as well. It should then be explored to what extent choosing the appropriate appearance for a player's in-game representations shapes their experience depending on their motives. For example, do dominance-motivated individuals enjoy playing the game less when they are forced to play with a cute avatar? In general, we encourage other researchers to utilize explicit motives when aiming to understand differential preferences, choices, behaviour and experiences in games.

5.7 Limitations

There are a number of limitations to our findings. Our samples of participants were limited to German university students and most of them identified as women; that our sample cannot cover the entire spectrum of gender representatively may have influenced our findings. Additionally, in this paper, we explain the theory behind how motives drive behaviour, as this motivational process, described by MDT, has not been introduced to HCI research before. However, we did not replicate this motivational process in the present work.

6 CONCLUSION

When people have the option to choose a digital representation for themselves, they can choose according to personal preferences. Social motives play an important role for these preferences, because they can affect how we wish to present ourselves in order to make an impression that we find desirable. MDT suggests that there are different ways in which players can influence others, and our findings demonstrate how this theory describes and predicts choices in a gaming context. Power motivation makes people susceptible to visual power cues, such as strength, and pairs them with the anticipation of positive emotions. A strong appearance is key in order to establish visible superiority. When it comes to power-motivated individuals who prefer strong-looking digital companions, this seems especially true for those power-motivated individuals who strive to dominate others, as opposed to those who strive to help others. Our results show that there is value in differentiating social motives in games, that in order to predict choices, enactment styles for such motives are worth considering and specifically, that a dominant behavioural style predicts a preference for strong Pokémon. Motives drive our perceptions, behaviour, and experiential outcomes. Therefore, they guide our choices, and shape how we interact with both the physical and digital worlds.

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Chapter 5:

Seek What You Need: Affiliation and Power Motives Drive Need Satisfaction, Intrinsic Motivation, and Flow in League of Legends

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Seek What You Need: Affiliation and Power Motives Drive Need Satisfaction, Intrinsic Motivation, and Flow in League of Legends

SUSANNE POELLER, Trier University, Germany
SASKIA SEEL, Trier University, Germany
NICOLA BAUMANN, Trier University, Germany
REGAN MANDRYK, University of Saskatchewan, Canada

In Motive Disposition Theory, the affiliation motive describes our need to form mutually satisfying bonds, whereas the power motive is the wish to influence others. To understand how these social motives shape play experience, we explore their relationship to Self-Determination Theory and Flow Theory in League of Legends. We find that: higher intimacy motivation is associated with greater relatedness satisfaction, autonomy satisfaction, enjoyment, and the flow dimension of absorption; higher prosocial motivation with more effort invested and the flow dimension fluency of performance; and higher dominance motivation with lower relatedness satisfaction but higher competence satisfaction and increased flow in both dimensions. We demonstrate that in addition to being driven to satisfy universal needs, players also possess individualized needs that explain our underlying motives and ultimately shape our gaming preferences and experiences. Our results suggest that people do not merely gravitate towards need-supportive situations, but actively seek, change, and create situations based on their individualized motives.

CCS Concepts: • **Human-centered computing:** → Human computer interaction (HCI) • **Applied computing:** → Computer games

KEYWORDS: motive disposition theory; social player; affiliation; power; intimacy; sociability; prosocial; dominance; MOBA; League of Legends; motivation; digital games; gaming; play; need satisfaction; flow

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1 INTRODUCTION

Author's addresses: S. Pöller, S. Seel, & Prof. Dr. N. Baumann Universität Trier, Fachbereich I – Psychologie, Universitätsring 15, 54296 Trier, Germany; R. L. Mandryk, The Interaction Lab, Department of Computer Science, University of Saskatchewan, 110 Science Place, Saskatoon, SK, S7N 5C9, Canada.

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With games having grown in popularity as a form of leisure activity, competitive sport, and socialization platform, researchers have sought to understand what motivates us to play and how player experiences can be explained and predicted. Research approaches often center around Self-Determination Theory (SDT) [61], as there is an increasing consensus on the importance of need satisfaction when aiming to grasp the motivational pull that video games have on their players [78]. However, researchers have also questioned whether there is a one-size-fits-all approach to satisfying needs within a game, noting that players have different experiences of playing the same game and that not all games satisfy all players in the same way (e.g., [10, 11, 14, 24, 51]). In attempts to explain these interindividual differences, the resulting plethora of player type models [3, 8, 24, 34, 51, 83, 84] have their origins within varying theories or ideas. There have been only a few attempts to systematically compare some of them to each other, provide an overview of their overlap, or connect them theoretically (e.g., [4, 25, 71]). As a result, there is still a lack of guidance for researchers as to when they should use which model. However, one commonality among the array of existing models is recognition of a player type referred to as 'social' (e.g., [24, 51]), suggesting that there is a consensus that some players like to socially interact more than others in games.

Multiplayer games, which are 'social' by definition, have risen to be the most successful and prevalent form of online gaming [22]. One explanation used by many is connected to Self-Determination Theory (SDT), stating that the need for relatedness is a universal need that all individuals share [20]. Yet, SDT—or its myriad mini-theories— provides little explanation of *how* people prefer to satisfy their universal need to relate to others. Motive Disposition Theory (MDT) [45, 46, 49], on the other hand, recognizes that the extent of the need to relate depends on the individual, and further that there is not just one form of social motivation, but multiple. The two big social motives distinguished by MDT are *Affiliation* and *Power*. Affiliation is a wish for mutually satisfying horizontal relationships, in which the main goal is to simply be with another person [12]. Motives can be enacted in multiple ways, depending on how an individual strives to reach their desired end-states. Consequently, affiliation can be further differentiated into *Sociability* (a wish for superficial relationships or being surrounded by other people) and *Intimacy* (the hope for close and intimate bonds with a limited number of people) [38, 40]. Alongside the affiliation motive, the power motive is characterized as a wish for vertical relationships, mainly the wish to have some sort of influence over another person [81]. This power difference can be the result of being in a leadership position, helping a person who is in need (i.e., *Prosociality*), differences in status, or even just being the subject of admiration [81]. It can also take more extreme forms, such as striving to overpower or dominate another person (i.e., *Dominance*), for example, while competing with them in a video game [54]. Both power and affiliation-motivated individuals share a common wish to interact socially with others, yet in different ways. However, this does not mean that these two motives are mutually exclusive. One person could be both affiliation and power motivated, while neither of these two motives might motivate another person. While many player type models recognize a single 'social' type, the lens of MDT shows that social motivations are complex, multifaceted, and have been the subject of study for decades before digital games became a popular leisure activity.

Self-Determination Theory and Motive Disposition Theory can complement each other and their conflicting assumptions (needs being universal vs. individually different) have been reconciled by some authors [66, 69, 72]. Both theories share the lens of needs (settled in

motivation psychology versus personality psychology) and have a similar focus, with the MDT motives of a) affiliation and power, b) achievement, and c) autonomy being comparable to the SDT need for a) relatedness, b) competence and c) autonomy. Both MDT and SDT can be further contextualized in games by considering the outcomes of satisfied needs during play. Flow [18], which describes player experience in terms of being absorbed in an activity or performing fluently, has been described as one result of satisfied needs, both for MDT and SDT [65, 70]. Taken together, MDT, SDT, and Flow Theory may help explain why a game does not engender equal fulfillment for all players—essentially explaining a question of importance to both researchers and developers: *why do different people have different experiences in social play?*

To address this research question, we conducted a study, focusing on the social motives as described by MDT (affiliation and power) and their different facets (which can be understood as different ways to enact the same motive) and the popular multiplayer game League of Legends (LoL) [60]. We explore how:

1. The strength of the affiliation and power motive affects need satisfaction while playing LoL (i.e., competence satisfaction, relatedness satisfaction, and autonomy satisfaction);
2. The social motives (affiliation and power) affect the experienced enjoyment for playing the game as well as the effort that players put into the game (intrinsic motivation);
3. The individual motive dispositions relate to the experience of flow (considering the sub-facets fluency of performance as well as absorption by activity) when playing League of Legends.

We find that intimacy-motivated individuals experience levels of relatedness satisfaction that are dramatically higher than those of less intimacy-motivated players and they even experience higher levels of autonomy satisfaction. Additionally, they report more enjoyment and higher levels of absorption by activity (flow). Prosocially power-motivated individuals report investing more effort into the game and they report higher flow experience on the dimension fluency of performance. The dominant power-motive significantly predicts higher competence satisfaction while playing the game but lower relatedness satisfaction. Dominance motivation is also associated with experiencing higher levels of flow on both dimensions (fluency of performance and absorption by activity) while playing League of Legends. Finally, when considering broad motives without a facetted view into how they are enacted, we find that the affiliation motive predicts relatedness satisfaction in the game, while the power motive predicts autonomy satisfaction.

Prior work that attempted to explain differences in play motivations and behaviour has focused on broad personality traits, such as the Big Five [50] (e.g., [11, 23, 30]), player typologies (e.g.,[9, 34]) or demographic factors, such as gender (e.g., [57]). However, describing differences between people in terms of personality traits, player types, or demographic factors provides limited perspectives into personalized experience during play, because they merely aim to describe phenotypes of people and which traits are often observed together, or what people frequently do (as opposed to what they enjoy or want to do). Rather, we propose that in addition to being driven to satisfy universal needs (described by SDT), we also possess individualized needs (described by MDT) that explain our underlying motives and ultimately shape our preferences and experiences. Our approach is in harmony with the idea that we play games to satisfy our needs, but adds that we do not

merely gravitate towards need-supportive games, but actively seek, change, and create gaming contexts that best satisfy us, based on our individualized motives.

2 BACKGROUND

What does it mean to be a social game player, when multiplayer online games have become the dominant form of gaming [22]? One goal of this work is to distinguish between different types of social motivation and to find how those types uniquely lead to different experiences in the Multiplayer Online Battle Arena (MOBA) game League of Legends (LoL) [60]. As previous work has been able to show, different types of games lead to differences in basic need satisfaction, which has been found to explain why some video games are more popular than others [61]. This raises questions of how different ways to play the same game lead to differences in how they are experienced. We describe four concepts: individual need strength (motives), experiences of need satisfaction, intrinsic motivation, and flow; our studies later explain how these concepts are connected in LoL.

2.1 Interindividual Differences in Need Strength

MDT has been prevalent in motivation psychology research for decades and has recently been applied to explain differences in video game preferences [54], choices [56], and behaviour [55]. MDT highlights a distinction between two types of motives [49]. The first, implicit motives, describes unconscious or implicit needs; the second, explicit motives or self-attributed needs, encompasses conscious or explicit motives that an individual believes they possess [49]. Implicit motives are affective preferences and assumed to predict spontaneous and long-term behaviour, as they are connected to the enjoyment of certain activities (such as socializing), through stronger physiological reactions in motive-relevant situations [46, 49]. Explicit motives, on the other hand, predict choices because they reflect what an individual believes to be a valuable activity (e.g., going to a party). If explicit and implicit motives are incongruent, individuals can sometimes choose to engage in behaviours that they ultimately do not enjoy very much [6], explaining why not all players get the same enjoyment out of the same activity. Explicit motives share variance with self-report measures of personality, such as the Big Five [21, 55] as well as with measures of playstyle preferences, such as the Digital Games Motivation Scale [24] or the BrainHex [51] player typology [55]. A preference for social game play has been found to be a relevant factor in different typologies (e.g., [24, 51, 76, 83]), which can be seen as an indicator that differences in social preferences play an important role, when trying to predict behavioural differences. The theoretical difference between playstyle typologies and motives is that motives endeavour to describe the needs that are fundamental in shaping preferences; for example, that someone identifies as the social player type (the preference) because they have a high power or affiliation motive (the need). As a result, a preference for social gameplay as described in player typologies can be the result of different types of social needs. Poeller et al. [55] report that both the DGMS Social and the BrainHex Socializer scale correlate with the explicit power but not the explicit affiliation motive, indicating that social interactions in games are likely to be power contexts and that more nuance on types of social interaction is needed.

2.2 Social Motives: Affiliation

The two social motives that are distinguished in MDT are affiliation and power [26, 42, 45, 46]. The affiliation motive is characterized as a wish to form mutually-satisfying relationships on a horizontal level [12, 43], whereas the power motive describes the wish for vertical relationships, in which one person has power over the other, for example due to helping them or by dominating them [46, 47, 81].

In a study that investigated behaviour on social networking sites, the explicit power motive predicted the number of friends and the number of uploaded pictures, while the explicit affiliation motive predicted the time spent on these sites per day [26]. In League of Legends, the explicit power motive has been shown to be connected to the preference for playing certain roles and champion types [54] and appearance preferences for digital companions [56], whereas the explicit affiliation motive (as understood by MDT) has not been explored yet in the context of games.

2.2.1 Affiliation: Intimacy and Sociability. The affiliation motive can be further distinguished into sociability (the wish for many interactions, that can often be superficial) and intimacy (an emphasis on fewer but strong or intimate personal relationships) [38, 80]. This distinction is supported by an early study in which a high implicit intimacy motivation was associated with a readiness for "warm, close and communicative relations" and negatively associated with outgoingness. [41].

2.2.2 Power: Prosociality and Dominance. The power motive is often distinguished into its more socially desirable prosocial outlets (guidance, helping, socialized power) and its less socially-acceptable enactment style (dominance, personalized power) [47]. However, power motivation always describes a concern with wanting to have an impact on other people. This can be achieved, for example, by helping them (prosocial power) or putting them in their place (dominant power) [46]. To highlight the distinction between the different terms and constructs used in this work, see Figure 1.

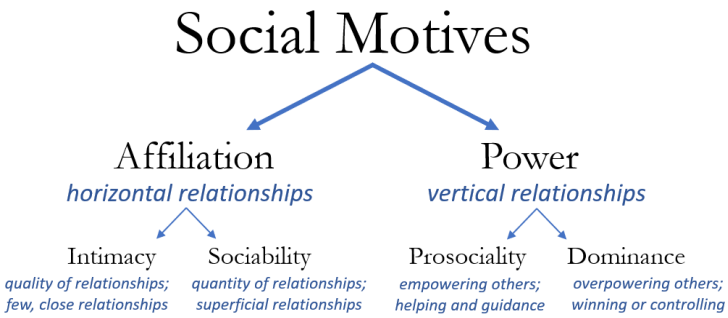

Figure 1. Schematic overview of the understanding of the motives and sub-facets that we discuss.

2.2.3 Four Facets of Social Motives. We use the term affiliation to describe the entire motive characterized by Motive Disposition Theory (as the original theory distinguishes the big three motives affiliation, achievement, and power) [12, 45, 46, 49] and treat intimacy and sociability as sub-facets of affiliation. This has been done before, with the explanation that the construct of affiliation "refers to two different types of affiliation experience: intimacy and sociability" ([38], p. 164). Additionally, we treat prosociality and dominance as two different ways to enact the power motive [75]. While the power motive, and its facets, have been defined and

utilized in a game context before [54, 56], the finer distinctions of affiliation have not been applied to the virtual world yet.
It has been concluded that intimacy in the gaming world is prevalent, even though the original understanding of the word suggests physical closeness, but also that for some players, the thought of experiencing intimacy in a gaming world sounds unlikely or uninteresting [53]. This is important, as it suggests that the motivation to experience intimacy in the digital world might be different from the hope to experience it in the physical world. Therefore, it seems necessary to assess the need for affiliation, and especially the sub-facet intimacy, separately when considering the digital world or physical world. To the knowledge of the authors, no questionnaires to assess the wish for intimacy in digital games are currently available.
Consequently, the first goal of the present paper is to assess game-related explicit motives.

2.3 Universal Needs and Intrinsic Motivation

As proposed by Self-Determination Theory, individuals share three basic needs (i.e., relatedness, autonomy and competence), and strive for their fulfillment [20]. As a result, intrinsic motivation is assumed to be highest for those activities that are likely to fulfill these basic needs [28, 52]. Accordingly, previous research has shown a higher enjoyment for games that satisfy these needs through play [61] as well as showing longer play hours when needs for relatedness, autonomy, and competence are satisfied through playing [31]. Because of its capacity to describe play motivations, Self-Determination Theory has become a standard approach of understanding games, gamers, and gaming (see [78]). Outside of gaming contexts, some researchers show that Motive Disposition Theory and Self-Determination Theory can be consolidated for a deeper understanding of individual need satisfaction [64], as MDT researchers assume that needs are not equally strong in every individual and that this can change the perception of whether or not they are satisfied. While this might seem contradictory to the assumption of needs being universal, as proposed by SDT, that does not have to be the case. The three needs can be universal to all individuals to some extent and still differ somewhat in strength and importance depending on the individual. As David C. McClelland once wrote when sharing his view on human motivation: “People clearly like interacting with other people, and some like it more than others” ([46], S. 346). After all, findings that satisfaction of universal needs leads some games to be more popular than others [61] do not imply that less popular games have no players at all. Certain individuals can still enjoy a rather unpopular game and even find that it satisfies their needs.
To give an example of how motives and need satisfaction are related, it has been shown in non-digital contexts, that motive dispositions consistently predicted corresponding feelings of need satisfaction, i.e., affiliation motivation predicted relatedness satisfaction and achievement motivation predicted competence satisfaction [65, 72]. This example demonstrated that motives and need satisfaction are related; we unpack the nature of this relationship further later in the paper. Our second aim is to explore how social motives affect the experience of need satisfaction and intrinsic motivation in an online multiplayer game.

2.4 The Experience of Flow

The experience of flow is one form of intrinsic motivation [17, 18]; it is considered to be an altered state of mind, in which an individual is completely immersed in a task [59]. It is

accompanied by: 1) a complete understanding of the task's requirements and rules; 2) an optimal level of difficulty of a task that is appropriate for the individual's skill level; 3) experiencing effortless execution of a task; 4) a high degree of concentration on a limited field of attention; 5) a distorted sense of time; 6) a loss of the feeling of self-consciousness; 7) a sense of control over the task; 8) a lack of awareness of bodily needs; 9) immediate feedback that enables adjusting task performance; and 10) effortlessness of action [59]. Due to the association with intrinsic motivation, flow serves as a positive reinforcement. Hence flow is said to be an optimal state of mind for performing, that predicts persistence, motivation, and positive coping strategies [13]. From the perspective of SDT, intrinsic motivation is well connected to flow experience [35, 74, 85]. From the perspective of social motives (MDT), it has been shown that women experience stronger feelings of control and contentment with themselves and the interaction with friends when they score high in affiliation motivation [82], whereas men experience more flow after winning a competition if they score high in explicit and implicit power motivation [62]. Our third aim is to connect motive dispositions to the experience of flow in League of Legends.

2.5 Motivation, Personality and Experiential Outcomes

There have been many research efforts with the goal of explaining the complex relationship between motive dispositions, need satisfaction, and flow experience but also with other outcome variables such as well-being [69], or subsequent motivation [68]. Often motive dispositions are treated as moderating variables of the relationship between need satisfaction and flow (e.g., [65, 70]). Some authors have concluded that universal and individual needs are complementary when aiming to predict flow, showing that motives become more relevant when aiming to predict domain-specific rather than general flow experience [66]. Concretely, this means that achievement-motivated individuals experience more flow in achievement-relevant situations (such as work) if their need for competence is satisfied. However, when asked about their general flow experience over the course of four weeks, competence satisfaction made the prediction without being moderated by the achievement motive [66].
To summarize, motive dispositions, as well as need satisfaction and intrinsic motivation, have been connected to flow experience individually. Need satisfaction predicts intrinsic motivation and motives have been found to moderate the relationship between need satisfaction and flow experience. The three different psychological theories (MDT, SDT and Flow Theory) have been linked to each other and are describing different motivational states. Need satisfaction, intrinsic motivation, and flow experience can be both experiential outcomes and a source of subsequent motivation. As our focus is on how motives predict experience, we use social motives as a predictor and need satisfaction, intrinsic motivation, and flow experience as different outcomes, well aware that they are connected to each other. The goal is to show how motive dispositions relate to these different theories within the experience of playing a competitive multiplayer online game.

2.5.1 A Jungle of Psychological Theories. As previously mentioned, there is little guidance for games researchers when it comes to the utilization of theories from different psychological disciplines. Some psychological theories have clearly made their way into interdisciplinary research and are widely known, available, and therefore used [78]. When it comes to motivational theories, however, Self-Determination Theory is the only frequently used

motivational theory in games research specifically, or even in human-computer interaction (HCI) in general. As a result, researchers have attempted to develop their own motivational models to account for interindividual differences in game motivation [24, 83] or have used measures from personality psychology [16, 50]. Theories of motivation intend to explain how motivation leads to behaviour, whereas theories of personality aim to describe different phenotypes of people, without considering what caused the observed differences. As a result, both disciplines aim for different approaches to measuring their constructs. Motivational theorists are concerned with validating the process of how key motivations influence behaviours, whereas personality theorists aim to define broad constructs with categories that have as little as possible overlap and show which traits are likely to be observed together. Of course, resulting constructs can still show substantial correlations with each other [21, 55], possibly resulting from similar motivations being observed in people who also appear to be similar (i.e., express the same traits). However, the same characteristics (e.g., extraversion or social player type) can be connected to different underlying motivations (e.g., affiliation or power). Therefore, researchers should choose the theory they wish to apply carefully depending on their research question, to ensure validity. Existing player motivation questionnaires, even though they refer to the word 'motivation', have not yet validated the motivational process in which the identified factors drive behaviour, rather than just describing it [24, 83]. In comparison, motives are assumed to shape behaviour by orienting, selecting, and energizing behaviours [46, 56]. The same phenomenon of describing behaviour and assuming an underlying motivation has been a subject of discussion among motivational psychologists in the past, and David C. McClelland described it 35 years ago:

> *"Before we give up altogether trying to find motives of general significance, let us examine more critically the process of identifying motives that has just been described. First, to say that because people do something, they must want to do it is little more than animistic thinking. It is like saying that because a plant grows it wants to grow, or because the apple falls, it wants to fall. As Heckhausen (1980) and others have long argued, such a naming process is tautologous. It adds nothing of scientific value or our understanding of what is going on unless we have some independent way of measuring the alleged motive behind the behaviour."*
> ([46] page 33)

Self-Determination Theory is one such theory that is concerned with needs that drive human beings. This theory is applicable when aiming to design games that are appealing to the majority of players, but it provides no aid when aiming to tailor a game to a specific sub-group or to those players who do not find the majority of games appealing. Motive Disposition Theory is a theory aiming to explain interindividual differences in motivation; however, it has its limitations as well. Motives cannot always precisely explain what a person will do; for example, just because two people want to make friends in a game it does not mean that they will use the same strategies to find friends as different people can use different approaches to achieving the same goal. The theory has grown so complex, that many of the newer articles focus on small details of it, rather than providing a broad view on the current state of the theory, which is why recent overviews on the theory as a whole can be hard to find. This lack of digestible theory overview may explain why non-psychologists in interdisciplinary and applied contexts have rarely applied MDT. Finally, arguably not all game designers are

interested in maximizing every single player's needs. In the spirit of utilitarianism, many game designers might be perfectly happy with maximizing need satisfaction, enjoyment, and flow for the majority of their players.

2.6 League of Legends

As a game environment, we turn to League of Legends (LoL) [60]—a competitive Multiplayer Online Battle Arena (MOBA) game with a large playerbase that had been the most-played multiplayer-game for many years [86]. Two teams face each other in battles that last around 15 to 50 minutes. Each matchup brings new challenges and playing together well as a team is crucial to be victorious. LoL is a team game and therefore social by definition. Players have to deal and work with other players as well as fight other players. This allows for a multitude of social interactions. Players can make friends and then chat and play with them (incentives for the affiliation motive); yet the game is also highly competitive, which allows for prestigious collections, such as indicators for having been high up in the ranking system of the game in the past. Furthermore, players can attempt to take the lead in their temporary team and try to make other players follow their strategies (incentives for the power motive). The popularity of the game indicates that playing it should result in a large number of positive experiential outcomes, yet at the same time it is known that players find MOBAs very frustrating [33], and many leave the game due to its competitive nature and having experienced toxic behaviour [19]. Therefore, we argue that LoL is a suitable environment for studying experiences of players with different social needs.

We strive to understand how self-attributed social motives relate to experiences when playing LoL. We assess the wish for intimacy, sociability, prosociality, and dominance in a games context and explore how these motive facets relate to experience (needs satisfaction, intrinsic motivation, and flow) while playing LoL.

3 STUDY

The aim of this study was to explore how the explicit power motive, the explicit affiliation motive and the sub-facets of intimacy and sociability (affiliation) as well as prosociality and dominance (power) drive experiential outcomes of playing League of Legends. Therefore, we measured explicit motives as well as need satisfaction of the basic needs: relatedness, autonomy, and competence, and the experience of intrinsic motivation and flow. We also asked about implicit motives and playstyle preferences, but to stay within the scope of the paper, we report only on explicit motives, experiential outcomes, and demographics.

3.1 Method

3.1.1 Participants and Procedure. We recruited 191 League of Legends players (mean age=22.6, SD=3.4; women=54, men=133, non-binary=3, missing=1) at the Trier University, as well as through social media, and asked them to participate in an online survey. We recruited players in two different languages: German (N=171), as well as English (N=20). In the beginning of the survey, participants could choose to complete the survey either in German or in English; 15 people who participated in English were not native English speakers. Most participants (N=142) were University students, 10 were high school students, 12 reported being trainees and 26 were working/employed. As compensation, participants were either

able to gain course credit or were included in a raffle for 10€ paysafecards. The study was conducted in the beginning of 2020. 73 participants reported having more than 6 years of League of Legends experience, 56 participants reported three to six years of experience, 35 participants reported an experience between 6 months and 3 years and 13 participants were relatively new to the game and reported that they had been playing the game for less than 6 months. Self-reported Elo of the participants (individual skill level) within LoL was between Iron 4 (N=1) and Master (N=1) and the median Elo of participants was Gold 2. Considering that only around 20% of the players reach Gold 2 or higher, our sample can be characterized as consisting of rather skilled players. 169 participants reported playing on the EU West server and only 6 played on other servers.

3.1.2 Measures. We measured explicit motives, experiences of need satisfaction, intrinsic motivation, and flow during recent LoL playtime. Scales were presented in a fixed order. The survey took the participants about 60 minutes to complete.

The Explicit Affiliation and Power Motive. The general explicit affiliation motive as well as the general explicit power motive were measured with the 4-item Motive Enactment Test (MET) affiliation scale as well as the 4-item MET power scale [37, 67]. Participants rated their agreement to statements such as 'Being close to other people is more important to me than being successful' (affiliation) or 'I often provoke arguments with others' (power) on a 4-point-Likert scale ranging from 1='applies not at all' to 4='applies completely'.

The Game-Related Explicit Motives. We measured two facets of affiliation (intimacy and sociability) and two facets of power (prosociality and dominance). Power facets were measured using the same items as Poeller et al. [54, 56]. For the affiliation facets, a large item set was created after careful reviewing of multiple currently available questionnaires that assess the explicit affiliation motive [63, 67]. Items were adjusted to apply to multiplayer online game environments. The definition of the intimacy motive as a wish for close, mutually-satisfying relationships was considered. Sociability items were created centering around a wish for equally positive relationships, that do not require the same level of mutual understanding and closeness between the agents. Thus, to ensure content validity, the items are closely connected to existing scales that have been used in motive research for decades. To give some examples, the item "I enjoy cultivating meaningful relationships in games" can be linked to an item from the Motive Enactment Test (MET) [37, 67] affiliation subscales: "I enjoy meaningful exchanges with other people". The item "I have more fun if I can play with others" was inspired by the inverse-coded item "I don't really have fun at large parties" taken from the Personality Research Form (PRF) [29]. The item "I like to share thoughts and emotions with players who are important to me" can be connected to the Unified Motive Scales [63] intimacy subscale item "I want to be able to share all the good and negative emotions in a relationship". The reason for adjusting the items to the context of games in addition to using the Motive Enactment Scale [37, 67], was that literature on explicit motives [49] suggests that explicit motives have more predictive validity when they are assessed closely to the present context (i.e., Multiplayer Online Games). Additionally, as some individuals might have trouble connecting emotionally with others who are not physically close to them (which is often the case when playing online games), there is theoretical reason to assume that the context matters in our present study (see Background). All items had previously been tested in a series of unpublished smaller studies and have been revised multiple times, resulting in the present item set. We would like to stress that the distinction

between intimacy and sociability within the affiliation motive does not represent a new model; instead, we adapted an existing model to a new context and therefore assume adequate structural validity for our exploratory study as justified by the existing theoretical background.

Each facet was measured with three items and participants were asked to rate how much each statement applied to them on a 4pt-Likert scale from 1='does not apply at all' to 4='applies completely'. All items, internal consistencies and statistical values are reported in Table 1. Internal consistencies ranged from α=.651 (dominance) to α=.798 (intimacy).

Table 1. Items of the four scales

Scale	Item text
Intimacy (α=.798; Mean=2.78; SD=.83)	
Intimacy 1	I take pleasure in mutually bonding with other players
Intimacy 2	I like to share thoughts and emotions with players who are important to me
Intimacy 3	I enjoy cultivating meaningful relationships in games
Sociability (α=.688; Mean=3.19; SD=.68)	
Sociability 1	I enjoy the company of other players in a game
Sociability 2	I have more fun if I can play with friends
Sociability 3	Enjoying positive social interactions is an important part of gaming for me
Prosocial (α=.691; Mean=3.03; SD=.66)	
Prosocial 1	I enjoy assisting other players when they need help
Prosocial 2	I am eager to provide emotional support for other players
Prosocial 3	I help other players through the difficulties they face
Dominance (α=.651; Mean=2.7; SD=.81)	
Dominance 1	I enjoy dominating others in a game
Dominance 2	I am willing to use aggressive tactics in a game to get my way
Dominance 3	When other players challenge me, I want to put them in their place

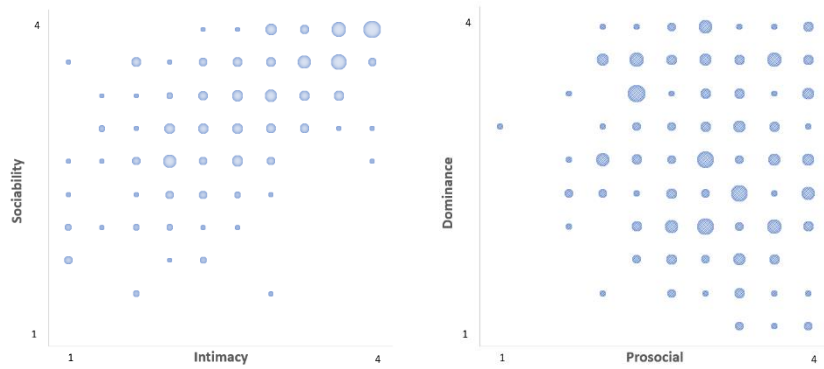

Figure 2. Visualizing relationships between the facets of both social motives (affiliation on the left; power displayed on the right side); the size of each circle represents the number of participants with equal values.

Need Satisfaction in League of Legends. Participants were asked to rate the amount of need satisfaction they experienced while playing LoL over the last four weeks prior to the study. We used the Player Experience of Need Satisfaction (PENS) scale [32, 61], measuring need

satisfaction levels for relatedness, autonomy, and competence (3 items for each dimension) on a 5-point-Likert scale ranging from 1-'strongly disagree' to 5-'strongly agree'. Cronbach's Alphas ranged from .652 (competence) to .827 (autonomy).

Intrinsic Motivation in League of Legends. Participants were further asked to rate how much intrinsic motivation they had experienced in the past four weeks while playing LoL, using the Intrinsic Motivation Inventory (IMI) [44]. We report on the two subscales interest-enjoyment (7 items; e.g., 'I enjoyed this game very much') and effort (5 items; e.g., 'I tried very hard to do well at this activity'), measuring intrinsic motivation on a 5-point-Likert scale ranging from 1-'does not apply at all' to 5-'applies completely'. Cronbach's Alphas were .716 for enjoyment and .700 for effort.

Flow Experience in League of Legends. Participants were asked how much flow they experienced while playing LoL in the four weeks prior to the study. We used the Flow Short Scale [58], measuring flow on the two dimensions fluency of performance (6 items; e.g., 'the right thoughts/movements occurred of their own accord') and absorption by activity (4 items; e.g., 'I was totally absorbed in what I was doing'). Participants were asked to rate each statement on a 7-point-Likert scale ranging from 1-'not at all' to 7-'very much'. Cronbach's Alphas were .764 for fluency of performance and .614 for absorption by activity.

3.1.3 Analyses. We conducted fourteen multiple regression analyses to predict levels of need satisfaction, intrinsic motivation and flow depending on the social motive facets as well as the general power and affiliation motive. To give an impression on construct validity, we will first report on the relationships between our independent motive variables. Motive Disposition Theory is a theoretical model with known interactions and communalities between different motives and facets, where one (explicit) motive combination might be more likely than another is. Different motives constantly predicting differential outcomes in motivational research (see Background) show that this does not diminish predictive validity of motives. To control for shared variance, we enter the sub-facets into our regression models simultaneously, meaning that predictions are made by the non-shared variance.

For completeness and because our experiential dependent measures are all theoretically connected to each other (see Background), all inter-correlations (Pearson's r) between them are displayed in Table 2.

All analyses were performed using IBM SPSS Statistics 25.

Table 2. Inter-correlations (Pearson's r) between our dependent variables (N=191).

	M	SD	[1]	[2]	[3]	[4]	[5]	[6]
[1] Competence	3.52	.83						
[2] Relatedness	2.78	1.03	**.15***					
[3] Autonomy	3.67	.75	**.38*****	**.34*****				
[4] Enjoyment	3.92	.61	**.35*****	**.35*****	**.49*****			
[5] Effort	3.58	.75	**.33*****	.14	**.30*****	**.39*****		
[6] Fluency	4.91	1.00	**.64*****	.12	**.27*****	**.30*****	**.25*****	
[7] Absorption	4.68	1.08	**.35*****	**.19****	**.39*****	**.42*****	**.22****	**.36*****

Note: M and SD are used to represent mean and standard deviation, respectively.
* indicates p≤.05; ** indicates p≤.01; *** indicates p≤.001.

Facets of social explicit motives as understood by Motive Disposition Theory are related in a similar way as the satisfaction of different needs as understood by Self-Determination Theory

are (see Table 2). Both facets of affiliation (as we measured them with a focus on the games context) correlate with the general MET affiliation motive, which measures the same theoretical construct outside of the game context and without distinguishing between the sub-facets of intimacy and sociability ($r=.278$, $p<.001$ for intimacy and $r=.314$, $p<.001$ for sociability). These correlations are an indicator for convergent validity. The MET affiliation scale neither correlates with the dominance nor the prosociality facet of the power motive: an indicator for discriminant validity.

The MET power scale correlates with the dominance scale ($r=.344$, $p<.001$) but not with the prosociality scale. This is not unexpected as the items of the MET power scale focus on the dominant aspect of power rather than the prosocial one. The prosociality and the dominance scale do not show a significant correlation. While in the domain of implicit motives, power facets are understood to share a common underlying motivation [81], it has been argued that for explicit motives that are motivated by social desirability, prosociality and dominance are likely to be more distinct as they are not both seen as equally socially desirable [54]. Therefore, this result can be seen as a replication.

Intimacy and sociability show a significant correlation ($r=.645$, $p<.001$). This is because they are facets of the same motive and because many people might enjoy interacting with others on both a superficial and a personal level. Since explicit motives are cognitively elaborated, this can be easily explained by people having the concept of themselves as liking to interact with other people. Both facets of affiliation correlate with prosocial power ($r=.560$, $p<.001$ for intimacy and $r=.363$, $p<.001$ for sociability), which is in line with theoretical assumptions that a given power-motive is enacted in more prosocial ways, when it is accompanied by a high affiliation motive [27]. However, prosocial behaviour in absence of a high prosociality trait should still be theoretically unlikely even if the affiliation motive is high. There are other known communalities between prosociality and intimacy, such as that they are both linked to high levels of self-regulation [7, 15]. No correlations of other facets with dominance are observed. Relationships between the two sub-facets of each motive are visualized in Figure 2.

4 RESULTS

All results are displayed in Table 3 and Table 4. We provide goodness of fit indices for each model, along with standardized beta values (β) and t-values for each predictor. The significance of effects is noted with *p<.05, **p<.01, ***p<.001; associations that are not significant after Bonferroni correction for multiple tests are highlighted with $*^{b}$.

4.1 Social Motivations and Need Satisfaction

We found that intimacy-motivated individuals experienced substantially more relatedness satisfaction while playing the game. In total, the social motive facets together can account for 41% of relatedness satisfaction variance (see Table 3). Additionally, intimacy motivation also significantly predicted autonomy satisfaction while playing LoL. Sociability motivation as well as prosocial motivation did not predict experienced need satisfaction (see Table 3). Competence satisfaction was predicted by the dominant power motive, showing that dominance-motivated players report experiencing more competence while playing League of Legends (see Table 3). However, dominance also negatively predicted relatedness satisfaction, meaning that dominant players find their need for relatedness less satisfied in

the game than other players (see Table 3). The general affiliation motive (not considering enactment styles) significantly predicted relatedness satisfaction, while the general power motive significantly predicted autonomy satisfaction (see Table 4).

4.2 Social Motives and Intrinsic Motivation

Intimacy motivation significantly predicted enjoyment when playing LoL, showing that intimacy-motivated players reported to enjoy the game more (see Table 3). Prosocial power motivation predicted self-reported effort while playing, indicating that prosocial players try harder when playing the game (see Table 3). Sociability and dominance motivation (see Table 3) as well as overall power or affiliation (see Table 4) did not significantly predict experienced intrinsic motivation while playing LoL.

4.3 Social Motives and Flow Experience

Table 3. Multiple regression results for the experience predictions using motive facets as predictors (*df= 4, 186* for all regressions).

				Intimacy		Sociability		Prosocial		Dominance	
	R	*adj. R^2*	*F*	β	t	β	t	β	t	β	t
Competence	.38***	.13	8.03	.06	.57	.06	.69	.05	.59	**.36*** **	**5.25**
Relatedness	.65***	.41	33.99	**.63*** **	**7.67**	.05	.67	-.05	-.65	**-.14***	**-2.49**
Autonomy	.25*	.04	3.19	**.31****	**2.99**	-.11	-1.13	-.09	-.99	.10	1.42
Enjoyment	.30***	.07	4.71	**.22*[b]**	**2.16**	.07	.78	.05	.55	.01	.19
Effort	.25*	.04	2.98	.07	.67	-.06	-.67	**.19*[b]**	**2.23**	.14	1.89
Fluency	.38***	.13	7.96	-.01	-.07	.03	.35	**.22****	**2.68**	**.33*** **	**4.80**
Absorption	.38***	.12	7.64	**.25***	**2.51**	-.09	-1.06	.04	.46	**.30*** **	**4.34**

Note: *) indicates p≤.05; **) indicates p≤.01; ***) indicates p≤.001.
b) Marks associations that are not significant after Bonferroni correction for multiple tests

Table 4. Multiple regression results for the experience predictions using general motives as predictors (df= 2, 188 for all regressions).

				MET Affiliation		MET Power	
	R	*adj. R^2*	*F*	β	t	β	t
Competence	.12	.01	1.46	-.08	-1.12	.11	1.48
Relatedness	.20*	.03	3.77	**.19***	**2.53**	.04	.054
Autonomy	.20*	.03	3.75	-.02	-.27	**.20****	**2.72**
Enjoyment	.12	.00	1.26	.05	.61	.10	1.32
Effort	.10	.00	1.03	-.11	-1.43	.01	.17
Fluency	.11	.00	1.09	-.03	-.44	.11	1.47
Absorption	.16	.01	2.35	.04	.56	.14	1.94

Note: * indicates p≤.05; ** indicates p≤.01; *** indicates p≤.001.

We observed that intimacy-motivated individuals reported greater absorption by activity when playing LoL (see Table 3). On the other hand, greater prosocial motivation was associated with higher fluency of performance (see Table 3). The dominant power motive

strongly predicts flow experience on both dimensions, absorption by activity and fluency of performance (see Table 3). The extent of sociability did not predict reported flow experience in LoL (see Table 3) and neither did the general power nor affiliation motive (see Table 4).

5 GENERAL DISCUSSION

Even a game as competitive as LoL can be played in a more or less social way, depending on the motives of the individual player. Whereas power-motivated individuals are likely to thrive in a competitive environment, affiliation-motivated individuals may want to just be together.

Our Contribution: Integrating Different Theories of Motivation

Our main contribution is theoretical, with an exploratory study to show that MDT is relevant not just to preferences [54], behaviour [55] and choices [56] in games, but also to experience. While Self-Determination Theory (SDT) has been widely adopted in Human Computer Interaction research, and Flow Theory has also been used to explain high engagement with games, Motive Disposition Theory (MDT) is relatively unknown. In motivation research however, a multitude of theories are prevalent. SDT focuses on situations that bring about need satisfaction and MDT focuses on person-centered variables that bring about need satisfaction. Because SDT assumes that there is a universal need in every individual, the need is usually not measured. MDT does not contradict the assumption that there is a general need to belong that all human beings share to some extent, but it allows us to measure the individual strength in which needs express in an individual, as it is a theory of differential motivations. SDT has been adopted widely and can explain certain relationships (e.g., why the majority of players like a specific game) very well. However, when researchers try to use SDT to explain things that the theory does not center around (i.e., why different players experience the same game differently), it can lack predictive power (e.g., [14]). We argue that this is because the theory does not focus on individual need strength. Therefore, we give an example on how different motivational theories have greater explanatory power when used together—an approach that is already prevalent outside of Human Computer Interaction research [64, 65, 69, 70, 72] but has not been applied to the context of digital games before.

5.1 How do Social Motives Predict Play Experience?

5.1.1 Affiliation (Intimacy and Sociability). Our results suggest that motive dispositions can drive need satisfaction in games, as the intimacy motive can strongly predict the extent to which players can satisfy their need for relatedness and even autonomy in a game. This shows that needs are not just satisfied passively by the properties of a game but that a strong drive of a player can actively improve their experience. League of Legends has features that can be used to feel connected to other players (including a chat function, private messages, and playing with friends, as well as creating a competitive team with your friends, and showing off a team tag); however, these are optional. Perhaps intimacy-motivated individuals are more likely to use those features, whereas less intimacy-motivated individuals might ignore them and as a result they get less relatedness satisfaction out of a game that, even though it has socializing elements, is ultimately a competitive game. When looking at the overall affiliation motive, we still find that it predicts relatedness satisfaction but when looking at both intimacy and sociability in the same regression model, intimacy is what ultimately

predicts need satisfaction. Intimacy motivation has been found to be associated with higher levels of self-regulation [15], which might serve as an explanation of why it is so closely connected to need satisfaction. The effect of intimacy motivation on autonomy satisfaction might be related to the previously given explanation that players have the option to make friends and socialize with them in LoL. It is possible that for a highly intimacy-motivated individual, being given the choice and tools to play closely together with friends alone makes them experience autonomy. We also find that intimacy motivation is associated with other positive outcomes: for example, these players report that they enjoy playing the game more and they report experiencing flow on the dimension of absorption by activity. Maybe the experience of competence is tied to winning but having fun is more likely when playing together with close friends.

We find no connection between sociability and experience when entering sociability and intimacy into the same regression model. There are a number of possible explanations but all require further clarification in future work. One possibility is that the construct itself is not well defined or not accurately measured by the scale we used here. A future scale validation is required. Another possible explanation is that self-reported sociability, as we measured it, was too broad of a construct. As such, it might be close to constructs such as extraversion or a social playstyle. Equally, we found that few of the participants scored low in sociability (see Figure 2). Therefore, most players of social multiplayer online games such as League of Legends might be somewhat sociable. However, the main reason was that we tested intimacy and sociability concurrently in the same model and the effect of intimacy motivation was stronger than the effect of sociability (both affiliation facets share a substantial amount of variance). Overall, our findings are in line with previous studies that connected the affiliation motive to higher levels of satisfaction of the need for relatedness [72], but we provide a more detailed understanding of the game context and explicit motive sub-facets.

5.1.2 Power (Prosociality and Dominance). When it comes to general power motivation, we find that it predicts autonomy satisfaction, which is connected to neither the prosocial nor the dominant power facet. This might indicate that the explicit power motive in the digital and physical world expresses differently because power motivation is more socially desirable in games.

The prosocial power motive was not associated with need satisfaction and it was not connected to enjoyment of the game. However, we found that prosocial individuals reported higher investment of effort into the game. The wish to help and guide others seems to be connected to trying harder, possibly because this might not be easily achieved in a game such as League of Legends, or because in order to be able to help others, one has to become strong first. This result is particularly interesting because recent work has defined the term "tryharding" as a possible factor of negative behaviour in games [77]. While that might not be the same definition as the effort scale which we used, there should still be some overlap. It might be that when people try too hard, they lose sight of the fun in a game and become more negative; on the other hand, trying hard is crucial in a competitive game and needed in order to win and be helpful. Either way, it seems unlikely that prosocial players would show toxic behaviour because they report investing more effort, however, future work should explore these relationships. Prosocial players also find themselves performing fluently in the game, experiencing an amount of flow that is substantially higher than that of non-prosocial players.

Finally, our results clearly show that dominance motivation in games can lead to positive experiential outcomes in a competitive game such as League of Legends. Gaming is a context in which players can be dominant and where crushing the enemy team is socially desirable. Finding an outlet for this social motive, which is generally characterized as rather undesirable, in such a game can make players feel competent and experience flow. One could say based on our results that dominant individuals thrive in this gaming context. However, this fulfillment seems to come at a cost and that is, that dominance motivation seems to inhibit relatedness satisfaction through LoL. This might be due to these players immersing themselves in the competitive aspect of the game, which is in line with previous findings that dominance-motivated gamers report a preference to play champions that are strong in 1v1 fights [54]. Playing games with the focus to put others in their place and overpower them might be something that other players do not always respond well to, and that requires seeing others as enemies rather than friends, and as a result, dominant individuals might not feel strongly related to them. The question remains of whether this lack of relatedness satisfaction is something that impairs the experience of dominant individuals or whether they would see it as a worthy trade-off to feel competent at the cost of satisfying relationships in the game because the experience of competence might be slightly more important to them. That the experience of flow in a complicated and competitive game is strongly connected to dominance motivation does not come as a surprise. Dominance-motivated players both perform fluently and feel absorbed while playing the game, indicating an immersive experience.

5.2 Individual Needs and Experience

Main effects of games and activities leading to more or less need satisfaction do not appear to be the whole story. Considering individual motivations may be an important tool in ensuring that all players can access need satisfaction through games, rather than just the majority. We show that people selectively experience the same game depending on their explicit motives. For example, people who are explicitly looking for intimacy find relatedness, enjoyment, and absorption and people who are looking for dominance find competence and a strong flow experience on both dimensions. Authors have called for more research in order to explain why the same activities in a game sometimes lead to different outcomes of need satisfaction for different players [14]. Our research question was "why do different people have different experiences in social play?" Our results make a significant theoretical contribution in this area by demonstrating that playing the same game does not lead to equally positive outcomes for everyone. Rather, individual needs (what we strive for) change how we experience the game. This leads to the question of where need satisfaction is coming from, if not merely from game design. Are motives the inner forces that predict need satisfaction? We cannot answer this question yet and further research is needed to fully understand the mechanisms of satisfied needs. But our results show that individual motives do not simply seem to be what draws us to a game and that we then stay because we find that our universal needs are being satisfied, as it has been suggested [79]. We demonstrate instead that players can contribute actively to having their needs satisfied, and that a positive experience cannot simply be given to the player. This broadens our view on the subject because in order to provide a satisfying and motivating experience, game designers do not simply have to satisfy universal needs passively, but can create a game experience that offers players the flexibility of actively finding their own strategies to satisfy the individual needs that are most important to them.

Researchers and game designers should strive to understand which needs different games are currently not satisfying. The current state caters to the needs of the majority of those people who already play digital games, which might lead to neglecting individual needs that are less common. Therefore, by considering differential motives rather than just universal needs, researchers can identify ways to satisfy needs even more effectively for everyone.

5.2.1 The Impact of Toxicity on Need Satisfaction in Social Games. Players with a high explicit affiliation motive are described as having a conscious need to harmoniously interact with others. We previously explained why a conscious approach motivation within the affiliation motive leads to behaviour in support of fulfilling this self-reported need for affiliation (people finding what they are consciously looking for). However, many multiplayer online games (including but not limited to MOBAs) are known for a high prevalence of toxic behaviour (e.g., [36, 39, 73, 77]). This would indicate that it might not be a well-suited place for individuals high in affiliation-motivation (who are looking for social harmony). Because we recruited mainly experienced and enthusiastic League of Legends players, it is possibly that our sample was selective. What our findings show is that intimacy-motivation predicted relatedness satisfaction within those players who did not leave the game, which could also be an indication of intimacy-motivated individuals who did not find relatedness satisfaction (or power motivated individuals who did not find competence satisfaction etc.) already having left the game. This would be a fruitful future research question and with only this one study we cannot provide the answers to such questions yet. Our aim was to describe that no matter what the game environment is, we find strong relationships between individual motivations and experiential outcomes, meaning that individual needs are connected to the player experience of frequent players of a game. We explain the importance of integrating multiple theories of motivation and broadening our research field by applying more of the many existing theories. Therefore, we propose a starting point for different future research questions from the perspective of Motive Disposition Theory.

5.3 Limitations

More research in in this area is needed and we do not know how our results compare to other MOBA games or even other genres. Additionally, we mainly recruited players who played League of Legends frequently. Therefore, it is possible that our findings do not generalize to more casual players of the game. We allowed participants to choose and complete the study in two different languages to reach a more diverse demographic. Some participants not being native English speakers and the translated version of questionnaires might have resulted in language effects; however, most participants completed the survey in German. As the questionnaire took 60 minutes to complete it is possible that participant fatigue and loss of participation motivation have affected our results. A future scale validation for assessing explicit motives in games would help further additional work in this area. Most importantly, for future work it should be noted that there is value in not just looking at straightforward main effects but also at interaction effects, to pay respect to interindividual differences, especially as it has previously been found that motive dispositions often moderate the relationship between basic psychological need satisfaction and flow experience. Finally, our study was an exploration of how a well-established theory predicts behaviour in a novel

context, i.e., gaming. We do not claim to test hypotheses and advise that our results should be interpreted with caution until they are confirmed by experiments establishing causality.

6 CONCLUSIONS

In the area of digital games, changes can be fast-paced, as game developers constantly try to evolve their own games to make them attractive to a broader audience. We argue that broadening the view on social motivations by including different facets of individual social needs is valuable to create a better game experience for everyone, rather than just the average player. Motives describe not just how much our needs are satisfied, but how much we are driven to satisfy them, and why. Further, they shape our preferences and thus might be useful to explain why different people experience varying need satisfaction within the same game. Our results demonstrate that motive dispositions influence user experience in League of Legends. Our work shows that in addition to having our universal needs satisfied, we also possess individualized motives, which explain why we actively strive to satisfy some needs more than others, thus driving differential social behaviour. Players gravitating towards situations that passively satisfy their basic needs are not the whole story, instead players perceive, use and experience the same situations in different ways depending on their individual needs.

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Chapter 6: General Discussion

Summary of Results

Chapter 2. Let Me Be Implicit: Using Motive Disposition Theory to Predict and Explain Behaviour in Digital Games. (Poeller, Birk, Baumann, & Mandryk, 2018)
In this paper, we aim to explore the opportunities of using Motive Disposition Theory in the context of digital games. One goal is to situate motives among other frequently used measures. We start by comparing implicit motives and explicit motives to selected player typologies, the big five as well as a measure of self-esteem. We find that there are numerous correlations between other self-report measures and explicit motives but few with implicit motives. Additionally, through an exploratory study, we show that the implicit affiliation motive can explain additional variance beyond what social self-report measures (e.g., extraversion and the explicit affiliation motive) explain while aiming to predict behaviour in the digital game *Minecraft*. Therefore, implicit motives are a valuable tool to apply in addition to the self-report measures that are currently the most frequently used approach. The results show further, that 1) implicit approach affiliation motivation is associated with rating other players as more likeable. 2) Approach-to-avoid motivation is connected to avoiding chat topics that were irrelevant to the task given to the team and; 3) avoidance motivation within the implicit affiliation motive is associated with more frequent use of smileys in the chat.

Chapter 3. Power Play: How the Need to Empower or Overpower Other Players Predicts Preferences in League of Legends. (Poeller, Baumann, & Mandryk, 2020)
While we have started by looking at the affiliation motive, we now shift the focus to the other social motive: power. Power motivation (as an underlying driving force of behaviour) has not seen much attention in games research so far. We explain how power should be differentiated from affiliation and why players should not just be distinguished by whether they are more or less social, but rather they should be differentiated by *how* they wish to be social. The focus of this paper is on explicit motives, which are not just looked at as a comparison but as the main research interest of the studies. A literature overview is given on the power motive and its interpretation in the past, and implications for the game context are identified. We develop an exemplary scale to measure two different facets of the power motive in the context of games and use it to predict playstyle preferences in the game *League of Legends*. We stress the importance of distinguishing enactment strategies (prosocial and dominant power motivation) when working with the explicit power motive because explicit motives are influenced by social desirability. We provide possible explanations and implications of our findings and contextualize them in both motive research and games research.

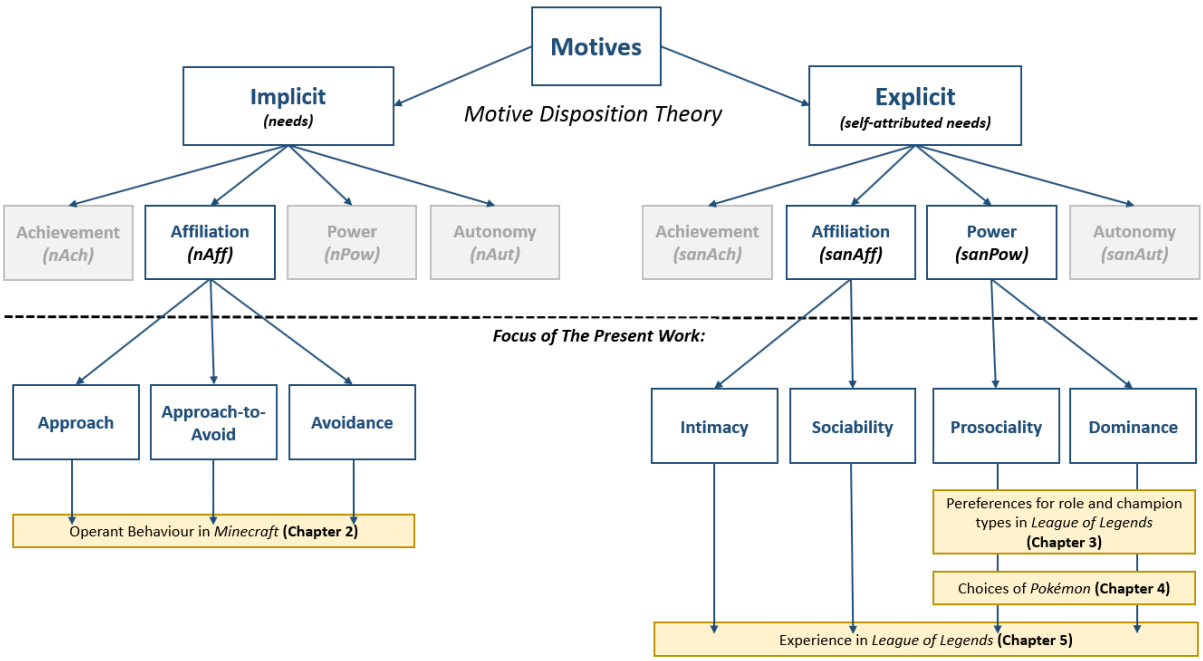
Chapter 4. Prepare for Trouble and Make It Double: The Power Motive Predicts Pokémon Choices Based on Apparent Strength. (Poeller, Waldenmeier, Baumann, & Mandryk, 2021)
We continue on the topic of explicit power motivation but change the context by looking at a different genre of games (the role-playing game *Pokémon* instead of the Multiplayer Online Battle Arena game League of Legends). We also look beyond preferences (what people say they like the most) towards choices (what people will choose from given alternatives) as our dependent variable. Rather than looking at playstyle again, we take an in-depth look at specific appearance choices for digital companions. Furthermore, we add the comparison of the affiliation motive to demonstrate that there is not just one type of social player but multiple. We find that power motivated individuals prefer strong-looking Pokémon as companions and choose fewer cute Pokémon than non-power motivated individuals. We interpret this as the wish of the player to express their social motivations and make choices that are in line with their social goals in multiplayer games. The affiliation motive does not predict the same choices as the power motive, indicating that different types of social players aim for different appearances (e.g., intimidating vs. approachable) to reach different social goals (e.g.,

impressing as many people as possible vs. making many friends). We replicate the importance of distinguishing dominance and prosocial motivation within the explicit power motive in the context of a completely different game by showing that dominance motivation is what ultimately predicts choices for strong Pokémon.

Chapter 5. Seek What You Need: Affiliation and Power Motives Drive Need Satisfaction, Intrinsic Motivation, and Flow in League of Legends. (Poeller, Seel, Baumann, & Mandryk, 2021)
Since motivation is closely connected to emotion, we take an in-depth look at the experiential outcomes of explicit motivations in the game context. A substantial amount of Human-Computer Interaction research in the domain of motivation centers around Self-Determination and Flow Theory. Both theories are concerned with desirable states that constitute a source of subsequent motivation. Motive Disposition Theory is different in the way that it centers around individual differences in motivation. Therefore, in this paper, we look at outcomes that depend on individual motivations. We find that explicit motives predict need satisfaction, intrinsic motivation, and flow experience when playing League of Legends. We distinguish the two social motives power and affiliation and two enactment strategies for each of the motives, providing a preliminary measure for explicit intimacy and sociability motivation. To summarize some examples of our findings: people high in intimacy motivation experience substantially more relatedness while playing League of Legends than less intimacy-motivated individuals. Dominance-motivated individuals on the other hand experience higher levels of flow in the competitive environment of League of Legends and higher competence satisfaction compared to less dominance-motivated players. However, their explicit dominance motivation seems to come at the cost of experiencing lower relatedness satisfaction. We conclude that different types of social players experience the game in different ways because they engage in different activities to seek what they need depending on who they are.

An overview of the four chapters and where to situate them within Motive Disposition Theory can be found in Figure B.

Figure B
Situating the chapters within Motive Disposition Theory.



Considering the seven studies that have been described, this work provides an overview of different game contexts in which Motive Disposition Theory can provide value and strengthen our understanding of the motivational pull behind video games for the individual. Different aspects of the theory are described in detail and connected to digital games and other theories which are already prevalent in the field of Human Computer Interaction. We highlight the value that implicit motives can bring to digital games research, especially if adequate methods are developed to assess them more cost-efficiently in the future. Further, the theory is situated among measures of personality psychology and motivation psychology as well as player typologies developed from the perspective of Human-Computer Interaction (HCI). The present work aimed to broaden the understanding of human motivation among game researchers and making literature from the field of psychology more accessible for interdisciplinary research, encouraging researchers to explore a variety of theories and adopting them in the field of HCI.

Contributions of this work

1. Applied Motive Disposition Theory to Gaming Research
Motives have been researched in a variety of contexts including but not limited to sports and leadership. However, there had not been an attempt to translate or test the assumptions of Motive Disposition Theory within the complex environment of digital games prior to this work.

2. Provided an Introduction and Overview on Motive Disposition Theory
Since the beginnings of theories on individualized needs more than eight decades ago, Motive Disposition Theory has often been applied using a variety of different names for it or without mentioning the name of the theory at all. This leads to the literature on the theory not being easily accessible to interdisciplinary researchers. This work is aimed to integrate the different names for the theory and its constructs used in the past and provide overviews on the current state of the theory.

3. Designed Studies Thoroughly and in Line with Theoretical Assumptions
The studies were designed with great care to what Motive Disposition Theory proposes. Theoretical hypotheses and important differentiations between similar constructs are noted. Study design decisions are justified by theoretical assumptions rather than simply applying the theory to a variety of contexts and noting the results. This pays respect to the fact that Motive Disposition Theory is well-researched, established and past the phase of theory building. That the studies are mostly exploratory due to the dependent variables from the context of games that have been used, does not diminish the attempt to ground all variables in theory and relate them to previous work in other contexts.

4. Differentiated Social Motivations in Players
My work focuses on the different social motivations that drive players in digital games. Therefore, an emphasis is on the affiliation and the power motive. I provide an overview of how these social motives relate to player typologies that have been used in games research as well as evidence that distinguishing different types of social players allows for a nuanced understanding of these players.

5. Looked in Depth at Popular Contemporary Game Environments
The focus is on games and environments that have been among the most popular games of the last decade. We researched games such as Minecraft, which has sold more than 200 million copies (The Verge, 2020), making it one of the most-sold games of all time. Further, we focus on League of Legends, which has been reported to be the most-played multiplayer online game for multiple years (Forbes, 2014, 2016), had 8 million concurrent players per day in 2019 (PC Gamer, 2019), and is still consistently ranking among the most played games in 2021 (Leaguefeed, 2021). Finally, we investigate Pokémon, which is a multi-billion-dollar franchise founded in 1996, including more than 20 digital games, movies, a TV series with over 1000 episodes as well as diverse merchandise (Statista, 2021d). Therefore, we explore different popular genres with Minecraft being an open world sandbox and survival game,

League of Legends representing a Multiplayer Online Battle Arena (MOBA) game, and the Pokémon games as representatives of the role-playing game (RPG) genre.

6. Focused on a Variety of Different Outcomes

Through the course of the studies, we take a look at different dependent variables rather than just exploring the same outcome in a variety of contexts. This includes behaviour, preferences, choices, and experiential outcomes. As a result, my research provides a starting point for several different research topics that could expand on these studies in the future.

7. Measured How People Behave

As pointed out by Baumeister et al. (2007), research in personality and social psychology is increasingly focused on introspection and self-report since the decline of behaviorism (Miller, 2003). As a result, conclusions are often drawn not from the observation of behaviour but from rating scales that ask participants about imagined future or hypothetical behaviours, not guaranteeing that these are always related to actual behaviour in such a situation. In the Minecraft study, we measure operant behaviour as our dependent variable. In the Pokémon studies, the participants were asked to choose their digital companions. In the League of Legends studies, we do intend to measure behaviour and experience through rating scales (introspective self-report), but we only gather data from players who frequently play League of Legends. Therefore, our participants experience the environment regularly, which should guarantee a closer link to actual behaviour than imagining a fictional or hypothetical situation that the participant had never actually experienced.

8. Provided Examples and Guidelines for Gaming-Related Explicit Motive Measures

The first attempt to measure explicit motives with respect to the context of games is notable for two reasons: First, explicit motives are assumed to be context-sensitive and should be assessed in a context as close as possible to the observed behaviour (McClelland et al., 1989). Second, motive researchers have traditionally neglected explicit motives and often treat them as a comparative variable or a nuisance rather than their research focus. This is due to the tradition of implicit motives being seen as the *actual* needs that can be hidden behind a *self-attributed* explicit need. Training methods focus on making individuals aware of their implicit motives and thereby avoiding motive incongruence, aiming to adjust explicit motives to the implicit motives to promote well-being (Roch, Rösch, & Schultheiss, 2017). However, *if* researchers agree that self-attributed explicit motives influence decisions and behaviours, even if mainly short-term and respondent behaviour in specific situations, then researching them thoroughly and as an end in itself should be in the best interest of every motive researcher. All assumptions that the theory makes should be tested and understood on both types of motives. It is important to not just understand how explicit motives can impair implicit motives from unfolding but also to understand how exactly explicit motives shape behaviour and experience.

9. Explored The 'Why' and 'How' Of Explicit Motives Shaping Behaviour

Motive Disposition Theory has described that motives orient, select and energize behaviour before the distinction between explicit and implicit motives has been made. Some researchers had their attention on values, goals, or conscious intents even before the construct of the explicit motive had been described. However, the understanding of explicit motives as we have it today is the result of researchers aiming to develop self-report measures to measure needs and failing to do so. As a consequence, a new construct - the explicit motive - was defined but has then not received enough attention in research. Our findings from studies that focus on explicit motives suggest that these functions of orienting, selecting, and energizing are also true for explicit motives but more research is needed to clarify this.

Limitations and Future Outlook

The present work should be seen as a starting point for multiple different directions. My point of view is not that Motive Disposition Theory can replace present theories or explain every behavioural outcome. Consequently, explicit motives were only applied when aiming to predict immediate choices and short-term consequences. Results for explicit motives predicting preferences, choices, and experiences would likely have been less strong if we had looked at long-term outcomes. For long-term consequences, implicit motives are bound to be the better predictor according to theoretical assumptions – but as explained previously, working with implicit motives is currently unpractical. Fortunately, more than one group of researchers is working on developing automated codings of implicit motives utilizing machine-learning approaches (Johannßen, Scheffer, Islam, Baumann, & Biemann, 2021; Pang & Ring, 2020; Schönbrodt et al., 2020). Once these approaches have been refined, they can be a starting point of how to automatically code implicit motives within a game by, for example, analyzing the words that players use when utilizing in-game chat functions.

Why Study Implicit and Explicit Motives Together?

When describing the limitations of using implicit and explicit motives while predicting behaviour (i.e., implicit motives not predicting respondent and explicit motives not predicting operant behaviour), this can be understood as a strength rather than a weakness of the theory. Since we already know what the theory is not supposed to predict in the first place, we can focus on more complex and specific models when working with it. I will give some examples here: When looking at our findings of specific explicit motivations predicting experiential outcomes (chapter 5), this might seem contradictory to the theory that proposes that implicit motives and not explicit motives are closely connected to affect and experience. However, it is plausible that people experience more relatedness in League of Legends because they made short-term choices that are determined by their explicit motives. For example, if a player is convinced that they wish to play a game socially and make close friends, then this will likely influence their short-term behaviours and they might make friends more easily because they are actively trying and as a result, they experience more relatedness. Whether these formed relationships and the social behaviour can persist for a long time, might then depend more strongly on the implicit than the explicit motive. There is a chance that this player's explicit motives are not stable, especially if they are not congruent with their implicit motives. Explicit beliefs about one's affiliation motivation could change when, eventually, difficulties in a relationship emerge or when negative experiences can highlight avoidance tendencies. Another possibility is that over time other social incentives (e.g., a prestigious achievement that can only be completed by teaming up with hardcore rather than social players) start shifting the explicit focus of this person away from affiliation. As they start to spend time doing other things, the quality and quantity of their in-game relationships fade away and so does their relatedness satisfaction.

A Specific In-Game Example of Motive Incongruence

There are many other examples to illustrate motive incongruence. Imagine a player of a Massively Multiplayer Online Role-Playing Game, high in implicit affiliation motivation, who struggles to find a guild that they find appealing within the game they are playing. This could be due to the perception that existing guilds focus on strength and winning rather than building the friendly and social community that this player is looking for. Eventually, this player decides to create their own guild according to their vision. They succeed in recruiting social players and a small and healthy community is created. As a result, this player could easily think that they enjoy being a leader. The initial success could result in many positive emotions and feelings of competence. Due to the positive emotions that emerge from the leadership experience, this player might now explicitly assume that they must be power motivated after all. However, as problems tend to emerge over time, imagine now that the player could eventually experience different sides of leadership. While everyone in the guild gets to

know each other better, more and more disagreements and resentments between individual guild members are brought to the attention of the leader. Not everyone who joined the guild was affiliation-motivated and looking for a place full of harmony. Some members cannot work together peacefully anymore. Arguments come up in the guild's communication channels. Not only is this not in line with the leader's goal of wanting a harmonious guild full of friendships, but they might also have to make difficult decisions, trying to intervene and having to make individual members unhappy. As a result of having to take sides, their strong affiliation motive can easily be frustrated. In addition to this, the leader starts to note more and more that they now stand out in the guild. As the guild grows, the leader finds themselves in a position of power and in a vertical relationship with guild members, who might not look at them simply as their friend anymore but as the leader. The leader has trouble experiencing horizontal relationships on the same level within their guild, which equally frustrates the affiliation motive. This does not mean that this leader does not make the right decisions, making the majority of their members happy. This person can objectively be very good at leading the guild they wanted. The problem is that they have started to sacrifice their enjoyment within the game by having to fulfil a task that is relevant to power motivation while the goal was to satisfy their affiliation motive. An implicitly power-motivated individual should be thriving in this situation, but the leader, who was mainly motivated by affiliation, does not. This can be seen as an example of motive incongruence in the power motive since the person explicitly thought they wanted to lead a guild to reach a specific goal but (implicitly) does not enjoy the task they chose to take on. There could be two possible consequences: 1) The self-attributed (explicit) need for power persists. This person keeps going, possibly remembering the good times and telling themselves that this is just a rough phase or valuing the goal of having this social guild so highly that they sacrifice their happiness. The affiliation-motivated guild members who do not have to deal with upcoming problems are generally very happy within the guild after all, as the leader created this place for them to thrive in. 2) The other possibility is that the leader eventually loses all enjoyment and motivation to keep going, potentially neglecting their duties. Either the guild falls apart or the leader will give up once they are no longer explicitly convinced that they want to be a guild leader.

Of course, this is a hypothetical situation but it serves to illustrate the nature of explicit and implicit motives as well as the importance of motive congruence for well-being. Additionally, it demonstrates an example of why simply asking participants to self-report their current preferences and behaviours in a game is not necessarily a reliable measure of the underlying (long-term) motivations.

Variety in Motivational Theories as An Opportunity for Games Research

While Motive Disposition Theory is one theory that should be a valuable addition to games research, there are other theories of motivation that are worth noting. The aim should not be to find that one theory that fits every context but to find the theory that fits a certain context best. For some research questions, this might be Motive Disposition Theory and for others it might not. The present work was aiming to provide the reader with examples for when this theory is helpful. As a summary: In social-evaluative contexts with structured decision making and in situations where people are confronted with a choice and make cognitively elaborated decisions, explicit motives should help explain the outcome of a situation. On the other hand, if there is little cognitive information given and choices are spontaneous or re-evaluated regularly (e.g., do I still like playing an archer after doing so for two months or is it time to become a warrior?) and whenever people base their future decisions on how past decisions made them feel, then paying attention to implicit motives should be of value. If the aim is to explore why different people have different experiences, we can pair motive dispositions with experiential outcomes of Self-Determination Theory (Deci & Ryan, 2000) or Flow Theory (Csikszentmihalyi, 1990) as has been done here for explicit motives (chapter 5). Other researchers have already suggested this strategy for implicit motives (Schüler & Brandstätter, 2013; Sheldon & Schüler, 2011). Further, when researchers wish to understand how different people respond to success and

failure in different contexts and why, we can utilize Motive Disposition Theory in combination with approach and avoidance motivation (Elliot & Church, 1997; Wirth & Schultheiss, 2006) or with theories of attribution (e.g., Weiner, 1972) to explain specific situational outcomes. If the focus is on understanding motivational difficulties in a game (for example the explicit wish to improve skill level or to finally complete a difficult achievement that seems blocked by properties of the situation or just by a lack of motivation), then we can turn to mindset theory (Gollwitzer, 2012) or the concept of action crisis (Brandstätter, Herrmann, & Schüler, 2013). This would be especially valuable when the goal that seems currently blocked is in line with individual motives or universal needs and achieving the goal would lead to positive experiential outcomes. These theories have been looked at in an isolated way, sometimes even in the context of games, but they can complement each other for a more complete understanding of the complexity in the motivations of human beings.

Which Theories of Motivation Are Out There?

Moving forward towards a better understanding of player motivation, game researchers should study theories and constructs of motivation in broader contexts. This can be beneficial for both psychologists, who strive for a better understanding of how different psychological constructs lead to behaviour, and game researchers, who can draw from the multitude of literature that is already out there. From the perspective of psychology, video games are a motivating activity in which behaviour can be observed comparatively easily and anonymously. The data sets created in this applied context would provide valuable insights into human behaviour without the need to invasively trace a person in their personal life and observing their behaviour manually. From the perspective of Human-Computer Interaction, digital game researchers can profit from the results of decades of efforts to understand human motivation. They can explore and selectively employ the theories that help them to advance their field. Self-Determination Theory is a perfect example of how fruitful it can be when researchers take a psychological theory to interdisciplinary research (Tyack & Mekler, 2020) but Self-Determination Theory is by no means the only theory that could further our understanding of what motivates players of digital games. Generally, clear terminology is needed to distinguish between different constructs (e.g., abilities, motivation, personality, drive, incentive) or outcomes (e.g., behaviour, self-reports, experience, emotions, preferences). Researchers should adopt a common language when studying player motivations, to make different research efforts more comparable to one another. They should aim to evolve measures that are based on theoretical assumptions or empirical research together rather than inventing new measures every other year, resulting in several different measurement methods and little guidance on how to use them. When labeling a measure as 'motivational', it should not simply reflect the behaviour and label it as the motivation. An example here would be the 'Moral' scale of the Digital Games Motivation Scale (De Grove et al., 2014), which suggests that a person who thinks that playing games is a valuable leisure activity must play games because of this. I argue that players can think playing games is valuable without playing for this reason. The 'Moral' scale suggests that this positive view of games is the very motivation that people play. Instead of labelling everything that players describe about their views and actions as a 'motivation', researchers should explain what the need or drive behind this behavioural phenotype is (e.g., why does a certain player like to play socially). McClelland's theory of human motivation (labelled as Motive Disposition Theory within this work) recognizes that motives are an individual disposition and a driving force but not the only determinant of behaviour. For a motive to lead to behaviour it has to be aroused first and then cognitions, habits, skills, and opportunities will alter the probability of it resulting in motive-congruent behaviour (McClelland, 1987). As such, behaviour is not simply the result of an underlying motive but also influenced by social incentives, demands, opportunities that are present, and individual skill levels. This does not diminish that differential needs exist but it makes it unlikely that the need can easily be inferred from self-reported behaviour as scales of player types suggest.

How to Work with Motive Disposition Theory

When applying Motive Disposition Theory, researchers should bear in mind that while it might be appealing to work with explicit motives rather than implicit motives, because they are easily assessed, this would provide a limited perspective into behavioural outcomes. As our results show (chapter 2), explicit and implicit motives are complementary rather than interchangeable and do not explain the same behavioural outcomes. Explicit motives are valuable when studying situations where social-evaluative incentives (e.g., a competition or a leaderboard) are present within a game or when cognitively elaborated decisions are made in a structured situation (e.g., choosing a role or a class in a new game for the first time without experience to base this decision on). Further, they can be employed when studying short-term behaviour (e.g., what will I be doing in a specific game on this specific day). However, many game researchers are interested in long-term behavioural trends or spontaneous behaviour as well. Many games also focus on the decision-making of players in ambiguous situations or simply on what different players enjoy the most. Motive Disposition Theory assumes for implicit motives to explain these outcomes and does not assume that explicit motives can provide reliable answers to such questions (McClelland et al., 1989). Researchers who are interested in investigating these relationships might have to accept that methods beyond the popular self-report questionnaires will be needed to answer those questions even if they are harder to conduct and validate. We have to stop trying to find the answer to every question in a few mainstream theories. Ultimately, every psychological theory is incomplete and only marks a construct, aiming to describe the obscure and complex human beings that we are. Still, theories can help us shed some light on the important relationships between variables within this existing complexity.

Achievement and Autonomy Motivation

Because of my strong focus on the two social motives (i.e., affiliation and power), it might still seem unclear which roles the achievement motive and the autonomy motive play in the context of video games. My focus should not undermine the value that studying these motives in detail could provide to the field. The achievement motive is by far the most thoroughly studied motive and arguably the motive that David C. McClelland was focusing on in his work (e.g., McClelland, 1961; McClelland et al., 1953). Multiple player typologies note types of players who could be connected to the achievement motive. Examples for such scales are ‘Advancement‘ and ‘Mechanics‘ in Yee’s GAMSQ (Yee, 2006); ‘Mastery‘ and ‘Achievement‘ in Quantic Foundry (Yee, 2015); ‘Performance‘ in the DGMS (De Grove et al., 2014); ‘Mastermind‘ and ‘Achiever‘ in BrainHex (Nacke et al., 2014) or the ‘Completionist‘ and the ‘Smarty-pants‘ type of the Trojan Player Typology (Kahn et al., 2015). While there seems to be an equally high consensus that something like ‘achievers’ exists in games, as there seems to be a consensus for the existence of a ‘social’ player, more focus is needed in my opinion on distinguishing the outcome and the underlying motivation. In our work (chapter 2), we found that while there was a moderately high correlation between the BrainHex *Mastermind* and the explicit achievement motive, neither the BrainHex *Achiever* nor the DGMS *Performance* scale showed any overlap with explicit achievement motivation. The DGMS Performance scale, however, was connected to the explicit power motive. This scale mainly asks participants about how fast they make progress in games and how well they are performing. Performance is an important factor to achieve a high status in games and status is relevant to the power motive. Achievement-motivated individuals might not necessarily advance fast, as they are likely more thorough in learning a new game and discovering the best and most efficient strategies. This should lead to a better objective long-term performance but not necessarily to fast progress. Looking at the BrainHex, the Mastermind scale has questions relevant to the achievement motive (e.g., ‘cracking a challenging puzzle’ or ‘devising a promising strategy’) that are targeted at doing something well and enjoying the content that is not quickly and easily completed. Consequently, there is a correlation with the explicit achievement motive.

However, the BrainHex *Achiever* scale was connected to the explicit autonomy motive. This scale

consists of items that are relevant to completing a collection (e.g., 'picking up every single collectible in an area' or 'finding an item you need to complete a collection'). When looking at the content of many games there is not much efficiency involved in such activities. Completing collections and hunting abstruse 'achievements' is generally a task for those who are passionate about it. Completing a collection is not necessarily challenging at all, it might just take a long time and often the rewards include cosmetic items or titles rather than important items relevant to gameplay. To give just one example from World of Warcraft: There are multiple exploration achievements within the game. The 'Universal Explorer' achievement is awarded to players who have unlocked every single part of the map, which means they have visited every single area within the game. Should someone wish to complete this achievement, it requires them to spend a lot of time running around on their own within the game, exploring every area even if they have no other reason to be there at all. As a reward, the player will then receive the title 'the Explorer' that they can display next to their name. My point is that the completion of in-game 'achievements' is not always challenging or efficient and does not even necessarily provide high status in a game. It requires *spending a lot of time with oneself* to then mostly *feel proud about one's achievement*, likely without receiving much recognition for it. When looking at the BrainHex Achiever scale from this perspective, it becomes apparent why it is more closely connected to the autonomy motive than it is to the achievement motive. While the labelling as 'Achiever' makes perfect sense when what the scale is looking to measure is the completionism of what most games level as 'achievements'. This task or behaviour still has little overlap with the idea of what is appealing to someone high in the 'achievement motive' as understood by Motive Disposition Theory, even if the names are similar. I conclude that there is more work to be done to improve the labelling of player typology scales and connecting them to theories of motivation. Studying the research on and definitions of the achievement and the autonomy motive can provide valuable insights on important distinctions.

Self-Determination Theory

Interdisciplinary Researchers have long identified a large number of suitable contexts to apply Self-Determination Theory (Tyack & Mekler, 2020). The theory is thriving and arguably at a peak of popularity among researchers. From my perspective, Self-Determination Theory is best applied when looking for utilitarian solutions and aiming to understand the majority of players. This theory helps us to understand subsequent motivation and why players repeatedly play the same games or go back to old games that they used to play in the past when they are currently looking to satisfy a specific need. This theory centers around the experiential outcomes of a situation and in general focuses on understanding situations rather than on understanding the person. The measurement methods of this theory are characterized by a first-person perspective (Koole, Schlinkert, Maldei, & Baumann, 2019) but interindividual differences in intrinsic motivation within a specific universal need are neglected. This theory explains the underlying need through the resulting need satisfaction and succeeds to consistently identify motivating contexts for a large number of players.

Flow theory

Flow is a word that is used to describe a very specific and desirable state. The state is understood to be the result of an optimal balance of a person and a situation. Flow is likely to occur when the skills of the person and demands of the situation are aligned, leading to just the right amount of challenge (Engeser & Rheinberg, 2008). As a result, this is an optimal and motivating state, that is generally described as pleasant. Game developers try to create flow experiences and players can seek them. However, there might also be some scepticism around experiencing this state within games in connection to research around problematic gaming. Flow experience could be labelled as problematic, for example when a player is fully focused on the game (the task) and does not notice the time passing. Some researchers have identified the experience of flow as a predictor of problematic gaming (Chou & Ting, 2003; Hull, Williams, & Griffiths, 2013). Despite such findings, researching flow as a positive

experience is worthwhile, and creating situations that allow for players to experience this desirable state is likely healthy in most cases (Vella, Johnson, & Hides, 2013). However, flow is just one aspect when researchers are aiming to explain the 'why' of player behaviours. It is entirely possible that specific players generally play video games because it allows them to experience flow, but since it is likely that not every player can experience flow regularly, the theory is not sufficient to explain all aspects of player motivation. Nonetheless, flow theory helps us to complete our understanding of positive experiences in games and provides one possible explanation for subsequent motivation.

Theories of Attribution

While there is not just one but multiple theories of attribution, they all have in common that they describe styles of individuals to explain human behaviours as well as successes and failures in specific situations. Bernard Weiner (e.g., Weiner, 1972, 2000, 2010), for example, focused on achievement motivation and proposed three dimensions that serve to describe the causal attributions that human beings utilize after success and failure. 1) The first dimension is *locus of control*, describing whether or not the cause of the outcome is assumed to be within the individual (e.g., the person did well) or is attributed to the situation or another person (e.g., someone else was there to help). 2) The second dimension is *stability* and is the judgement of whether this outcome would likely be the same in similar future situations (e.g., the person is smart) or was specific to this situation (e.g., the person put a lot of effort into studying for a specific test). 3) The third dimension described by Weiner is *controllability*, explaining whether a situation could have been controlled by the person (e.g., by putting in more effort) or not (e.g., the person got sick on the day of the test). Theories of attribution have a motivational component because the causes we attribute our achievements and failures (and those of others) influence our future behaviour. If a player does not succeed to complete a hard dungeon and assumes this to be the fault of their teammates, they might try again with a different team. However, if the player thinks that it is their fault because they were holding the team back, they might either work hard on themselves or not try again. Attributional styles are not an entirely new topic in Human-Computer Interaction research, with even a scale having been developed to measure player attribution within games (Depping & Mandryk, 2017), but to say that these theories are used widely or applied to their full potential would be an overstatement.

Approach and Avoidance Motivation

The concept of approach and avoidance motivation (Elliot & Covington, 2001) is relatively simple: approach tendencies mean that individuals seek out a positive outcome while avoidance tendencies are described when an individual is more strongly motivated by avoiding potentially negative outcomes. While this concept is prevalent in many ideas of motivation, it seems that different approaches generally favour one or the other. Avoidance motivation can be seen as somewhat prevalent in games research through the construct of *Escapism* within games (Calleja, 2010). However, this concept is often framed as an approach motivation (i.e., individuals actively seeking out the positive emotions of escaping reality). That players can be *motivated* to avoid something seems to be counter-intuitive. This perception might be further strengthened by the most prevalent motivational theories in Human Computer Interaction (Self-Determination Theory and Flow Theory), as both are limited to approach motivation. The research focus on approach motivation can also be illustrated with the help of common player typologies. Questionnaires that aim to classify players by their preferences or supposed motivations generally ask them what they like to do but not what they are trying to specifically avoid. However, imagine a player that decides to actively run away from a challenging opponent in a game environment because they do not wish to die. This would be an aspect that is not currently covered well by existing measures. Avoidance motivation is a strong motivating (or demotivating) force, which can take extreme forms (e.g., social anxiety disorder), and neglecting it inevitably leads to an incomplete picture. A player typology might, for example, lead us to assume that players who are low in 'challenge motivation' might be the ones to be most likely to avoid challenging

content. However, not being highly motivated to engage in challenging content is not the same as actively avoiding it to prevent failure. Since 'avoidance of challenge' is generally not measured as a motivation, the typologies fail to capture the players that might not actively seek fulfilment in games because they are perfectly happy to just avoid negative emotions. Out of all the measures that are being used frequently, Escapism, Trait Anxiety, (Low) Self-Esteem, and Neuroticism might be the ones that are closest to the concept of avoidance motivation. However, they are not necessarily measuring motivation (rather they measure personality) and they are not context-specific. From the perspective of Motive Disposition Theory, we can measure avoidance tendencies within each motive. For example, fear of failure can be seen as a type of achievement motivation (Elliot & Church, 1997) even though it might sometimes be connected to the opposite behaviour as approach motivation within the achievement motive (i.e., avoiding challenging content vs. seeking out challenging content). Regardless of the expected outcome, the concern of people that are highly influenced by fear of failure centers around achievements (or lack thereof). Instead of aiming to do well in a difficult task, they are worried about doing badly. As a result, they might even seek contexts in the game that are not closely connected to their motives (e.g., joining a guild with a social focus) – carefully avoiding situations that could lead to them experiencing fear. Classifying them as a social player (because they might report that they prefer to play socially) along with someone who really enjoys and actively seeks out friendships in games could be the misleading result from a limited perspective on motivation.

Mindset Theory, Goal Shielding and Action Crisis

When aiming to research explicit goals a player is working towards within a game, multiple theories can shed light on the process of how human beings pursue goals, respond to motivational blockades or difficulties that emerge within a situation. Striving to achieve a goal within a game can mean many different things: it could mean to try and become the leader of a strong guild or to aim for being high up on the leaderboards individually. Sometimes it can also mean to aim for completing a challenge that nobody has completed yet or simply to improve one's skill level. Of course, striving for a goal is not always simple. Not everyone can be among the best players and further obstacles (like not owning the best hardware) can be in the way as well. When individuals pursue a goal, they tend to pass through different motivational phases as described by *Mindset Theory* (Gollwitzer, 2012). The phenomenon of *Goal Shielding* (Shah, Friedman, & Kruglanski, 2002) describes a tendency of individuals to forget their other goals while they are particularly committed to one objective. This leads to a better focus and a higher probability of reaching a goal. On the other hand, when obstacles emerge, this might lead to a narrowed focus where alternative goals might not be considered. The concept of an *Action Crisis* is an example of newer advances in research of motivation. It describes an inner conflict while deciding between disengaging from an individual goal or continuing to pursue it (Herrmann & Brandstätter, 2015). During an action crisis, alternative goals are (re-)evaluated, allowing the individual to make a better decision on whether to continue pursuing or to disengage from the goal. While researching player goals might not be the first thing that comes to mind when aiming to understand players of digital games, it can be argued that many players set explicit goals for themselves within games. Reaching all goals within a game quickly might result in boredom but not being able to reach any goals might lead to a player quitting a game. Furthermore, these theories might be especially helpful in e-sports research.

Personality Systems Interaction Theory

Personality Systems Interaction Theory, abbreviated as PSI theory, is a complex theory that integrates many theories of motivation into one framework. PSI theory distinguishes seven levels of human motivation and also includes individual differences (Kuhl, Quirin, & Koole, 2020). These levels include habits, arousal, affect, coping with stress, motives, cognition, and volition. While this complexity can make the theory hard to grasp at first, it allows for a more complete and exhaustive understanding of behaviour. PSI theory can help explain why making a certain choice does not make everyone happy

(e.g., why different players who engage in the same activities within the same game do not get the same levels of enjoyment out of it as observed for example by Brühlmann, Baumgartner, Wallner, Kriglstein, & Mekler, 2020). The theory suggests whether decisions were made, for example, through cognitive elaboration or based on self-conception. PSI theory can help to provide a starting point on how to measure self-infiltration or motive incongruence reactively or non-reactively (Baumann, Kazén. Miguel, & Quirin, 2018). Simply because a player might engage in an activity over and over again does not guarantee that the behaviour will result in well-being. Players could keep playing out of habit, (as is also noted in the Digital Games Motivation Scale; De Grove et al., 2014) or due to a lack of better behavioural alternatives. Additionally, motive incongruence (Baumann et al., 2005) and false self-ascriptions (self-infiltration; Kazén et al., 2003), as well as avoidance motivation, can lead to unfavourable behaviour. To summarize, according to PSI theory, preferences can be seen as the result of the self-concept, enjoyment, habits, false self-ascriptions, social expectations, or self-incongruence. Many of these concepts are currently neglected in motivation research in the field of digital games or at least not a focus. Currently, the focal point is on positive experiential outcomes of video games with the common assumption that most players play because games make them feel good. This could be a result of the negative public image that digital games have been subject to (Kowert et al., 2012). Many game researchers started to shift the focus from a negative towards a more positive perspective. However, reports of problematic use of games persist (Dieris-Hirche et al., 2020; Männikkö, Ruotsalainen, Miettunen, Pontes, & Kääriäinen, 2020; Stevens, Dorstyn, Delfabbro, & King, 2020) and PSI theory is a theory that could help explain both positive and negative outcomes. It is an example of a more holistic perspective on human motivation, that I urge game researchers to strive for in the years to come.

Conclusions

I draw three major conclusions from my thesis.

1) Motive Disposition Theory represents a valuable approach to understand individual motivations within the context of digital games.

2) There is a variety of motivational theories that can and should be utilized by researchers in the field of Human-Computer Interaction to broaden the currently one-sided perspective on human motivation.

3) Researchers should aim to align their choice of motivational theory with their research goals by choosing the theory that best describes the phenomenon in question and by carefully adjusting the study design to the theoretical assumptions of that theory.

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