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A Quantitative Examination of the Impact of Moderating Variables on the Experience of
Eudaimonic Outcomes

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts in Communication

by

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University of Arkansas
Bachelor of Arts in Communication, 2021

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Abstract

There has been a growing body of research looking into effects beyond enjoyment of media content. However, these explorations have primarily been outcome focused and have failed to analyze variables that could be mediating eudaimonic effects. This thesis examined the results of an experimental study investigating the variables of flow and realism and their possible impact on eudaimonic outcomes of video game play. Using data collected from 193 participants who played either the game *The Last of Us Remastered* or *Elude*, this study examined the possibility of flow mediating the relationship between realism and eudaimonic effects. Results of a hierarchical multiple regression analysis revealed that flow and realism play a significant role in the experience of eudaimonic effects. However, flow does not play a mediating role between realism and eudaimonia. This study extended past research by providing evidence that flow and realism are related to the experience of eudaimonia. Additionally, this study continued to provide evidence of media effects beyond enjoyment. These results provide a rationale for future research on mediating variables and the impact they could play on eudaimonic outcomes.

Keywords: Eudaimonic effects, hedonic effects, flow, perceived realism

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Chapter 1: Literature Review

Video games have gone from what used to be a niche topic to now enthralling the masses and reaching nearly universal diffusion. Long ago are the days of relatively simplistic titles such as *Pac-Man* and *Space Invaders*, with the previous two decades having seen a rapid advancement in gaming. Not only have we seen innovations in the games themselves, but developers and players have matured with the genre, creating a demand for the game to “peer into the dark reaches of the very real human heart to deliver stories that are thrilling, chilling, and utterly absorbing” (Benedetti, 2010, para. 6).

With these developments, many researchers have examined the impact of these games. Early on, this was focused on the adverse effects such as violence and addiction (Anderson & Dill, 2000; Fisher, 1994). However, we have witnessed a shift to analyzing beneficial effects such as enjoyment (Bowman et al., 2013), mental health (Colder Carras et al., 2018), and prosocial behavior (Iten et al., 2018). However, one area seeing a recent pique of interest is the realm of *eudaimonic effects*, which are generally described as effects that go beyond simple pleasure and provide deeper meaning to media content, such as meaningfulness, well-being, and connection. Compared to other media, such as films, books, or TV programming, video games demand players to be active agents in the story and make decisions (Bowman et al., 2019). Because of this agency, games offer the chance to experience a wide range of emotions, create opportunities for reflection, and even provide players with a sense of meaning (Oliver et al., 2016). However, very little research has been done on factors that could lead one to a eudaimonic outcome.

Two variables that could play a role in the experience of eudaimonic outcomes are flow and realism. Both of these factors cause players to become immersed in the game, allowing for

heightened interaction (Daneels et al., 2018; Hur & Lim, 2021). These heightened interactions could be integral to experiencing eudaimonia. However, it is not known whether these two elements are necessary to reach a eudaimonic outcome. To explore this query, this study seeks to assess the relationship between flow states, realism, and eudaimonic effects in gaming. This work will expand our understanding of eudaimonic effects by focusing on realism and flow as possible mediators of eudaimonic effects. What follows is a review of scholarship's previous lines of thought on entertainment media, a review of eudaimonia and its prominent concepts, and a dive into the impact of flow and realism on the gaming experience.

Mood Management Theory

Some previous media effects research followed the assumption that hedonic motivations have driven entertainment selection. These thoughts stem from a mood management perspective (Zillmann, 1988; Zillmann & Bryant, 1986), which holds that one's primary goal is maintaining and maximizing pleasure and diminishing and minimizing pain. For example, after engaging in a verbal altercation, the individual would seek out positive entertainment (such as a comedy movie) to increase their mood. At the conception of Mood Management Theory (MMT), Zillmann & Bryant (1985) argued that scholars had neglected entertainment media and the process of media selection. At its core, the theory claims that an individual arranges stimuli intending to achieve or maintain a positive mood state. Further, Zillmann believed we should begin focusing on mood states' ability to predict one's media selections rather than the rational decision-making process argued in uses and gratifications theory (Herzog, 1944). The idea that mood states predict media selection is based on the concept of operant learning (behavior change occurs as a function of its consequence). In the early stages of operant learning, media selection would occur randomly, independent of our mood. However, as these selections either improve

negative mood states or maintain positive ones, the higher likelihood that those media selections will be made in the future. The use of operant learning also means the consumer does not need to be cognizant of the motivation driving their selective exposure to media content. In some situations, the user will recognize their hedonic motivations; at other times, media selection may be more intuitive (Reinecke, 2016).

Empirical support for MMT stretches back several decades. For example, Bryant and Zillmann's pilot study (1984) examined whether overstimulated individuals would seek relaxing media content while under-stimulated individuals would seek exciting media content. They induced these states by exposing participants either to washers being threaded onto a lace (boring) or having them take a timed exam (stressful arousal). As expected, the stressed participants chose the relaxing content, and the bored participants chose the entertaining content. More recently, Knobloch-Westerwick (2006) highlighted that individuals preferred to watch comedies when in negative mood states to increase positive affect. Bowman and Tamborini (2015) looked into MMT concerning newer interactive content through the use of a flight simulation video game. Results indicated that those exposed to boredom experienced the greatest mood repair through high demand, and those exposed to stress received the greatest mood repair through moderate demand, showing that MMT is still applicable to interactive media.

A more recent focus in entertainment media challenged the claims of MMT. Questions began to arise when scholars criticized MMT due to its failure to fully explain why individuals would seek out negative mood states over positive ones. For example, people will experience gratification after watching a sad movie but appear to do so without a positive effect on enjoyment (Oliver, 1993). Early attempts to address this paradox would typically cite hedonic

motivations, such as participating in downward social comparisons (Mares & Cantor, 1992) or purging negative emotions (Cornelius, 1997).

Other studies proposed that individuals are intrinsically motivated to consume entertainment for means beyond pleasure (Oliver, 2008; Oliver & Raney, 2011). Oliver (2008) explored why individuals seek out "sad" entertainment, such as horror and bad news. In such cases, people's inclination to seek out tragedies and sad films is paradoxical. Oliver found that study participants were not strictly viewing sad content for pleasurable purposes but rather for deeper meanings, such as the desire to elicit feelings of meaningfulness and insight. Other studies (e.g., Oliver & Raney, 2011; Wirth et al., 2012) corroborated these findings and highlighted MMT's inability to fully explain an individual's entertainment experience through mood management. These studies showed that motivations beyond pleasure, such as increased well-being, growth, meaningfulness, and life's purpose, were factors in media selection. The highlight of these challenges and the subsequent discovery of motivations beyond pleasure led to what we now call the study of eudaimonia.

Eudaimonia

The roots of eudaimonia trace back to Aristotle's *Nicomachean Ethics*, which differentiated between hedonic happiness and "true" happiness, which he claimed to be the chief good. In these writings, Aristotle emphasizes the kind of life individuals should seek to live in accordance with personal excellence and reflect on who they are as people in order to live a virtuous life. Modern research has drawn from these philosophical writings. Waterman (1993) was one of the first to analyze these two types of happiness: hedonic happiness (conceptualized in terms of pleasure) and eudaimonic happiness (conceptualized in terms of personal expressiveness, self-realization, and personal development).

Drawing from this work, the field of media effects has examined eudaimonia in relation to a multitude of mediated platforms such as movies (Oliver et al., 2008; Oliver & Raney, 2011), music (Kneer & Rieger, 2016), social media (Rieger & Klimmt, 2019), television (Bartsch & Schneider, 2014), and video games (Barr & Copeland-Stewart, 2022; Oliver et al., 2016). As these studies advanced, it became clear that these effects needed to distinguish between state and trait level hedonia and eudaimonia. The trait level is one's average degree of eudaimonia and hedonia that is presumed to be susceptible to change over time (i.e., one's baseline level). The state level represents a change at a given moment or within a restricted period, such as a given day, or during a specific activity, such as watching television (Huta & Waterman, 2014).

Though there have been advancements toward this distinction between hedonic and eudaimonic effects, clarity is needed regarding the conceptual dimensions of eudaimonia. The field employs a range of concepts that are often used synonymously while also not being clearly defined. For example, in a study looking at eudaimonic effects in video games, Oliver et al. (2016) and other inquiries based on that data (Bowman et al., 2016; Rogers et al., 2017) did not directly measure eudaimonia. Instead, they prompted participants to recall recent "meaningful" gaming experiences and used a single-item measure of "appreciation" without defining either term (i.e., leaving it up to the participant to decide). Up to this point, researchers have not reached a consensus on the definition or meaning of "eudaimonia" but have identified three prominent principal dimensions of the concept: well-being, meaningfulness, and connection.

Well-Being

Eudaimonic research on well-being has primarily been categorized in terms of functioning (that is, how well a person is doing in life or how far they have come; Huta & Waterman, 2014). Eudaimonic media experiences have been shown to promote numerous

aspects of well-being. For example, studies have shown that eudaimonic experiences can trigger nostalgic feelings, which have been shown to help diminish loneliness and buffer death anxiety (Juhl et al., 2010; Wildschut et al., 2006). Other studies have found that following some media experiences, there is an increase in life satisfaction (Janicke-Bowles et al., 2018), insight and intrinsic need satisfaction (Oliver et al., 2016), self-affirmation and self-worth (Toma & Hancock, 2013), self-actualization (Shao, 2009), and vitality (Rieger et al., 2014).

More recently, video games have been shown to affect users' well-being. Due to the medium's interactive nature, video games may be a productive way for users to seek relief from psychological stress, pursue goals related to mental health recovery, and achieve well-being (Bowman & Tamborini, 2012; Snodgrass et al., 2019). Multiple studies have examined the implications video games can have on an individual's well-being. Two examples focus on the concept of nostalgia, which serves existential and social functions, meaning that it is a psychological resource (Sedikides et al., 2015) that contributes to eudaimonic well-being (Baldwin et al., 2015). Wulf & Baldwin (2018) took this concept and examined the nostalgic effects of *Pokémon Go* and found that when players experienced game-induced nostalgia, it indirectly predicted the presence of eudaimonic well-being through eudaimonic experiences such as meaningfulness. Wulf et al. (2018) also looked at nostalgia through the lens of retro gaming and similarly found that nostalgia can lead to well-being through feelings of meaningfulness.

In addition to this, self-determination theory (SDT) has been frequently applied in research on eudaimonic well-being. SDT is interested in human motivation that focuses on self-determined and motivated behavior within the realm of play and sport (Ryan & Deci, 2000b). On its face, SDT examines hedonic satisfaction because it looks at enjoyment/happiness. Ryan &

Deci (2017), however, argue that happiness is a symptom of wellness due because happiness accompanies or follows eudaimonic effects.

SDT identifies three psychological needs “that appear to be essential for facilitating optimal functioning of the natural propensities for growth and integration, as well as for constructive social development and personal well-being” (Ryan & Deci, 2000a, p. 68). The first is the need for competence, which relates to the desire to control and experience mastery over one’s environment. In gaming, this would be achieved after defeating a challenging level, in turn displaying mastery over the game. A critical component of this need for competence is the balance of the challenge. If the individual finds the task too simple or too complex, they will lose motivation and fail to feel a sense of accomplishment. The second is autonomy, which is the desire to take control of one’s life through personal will. In a gaming sense, this aspect would be the ability to control the outcomes and decisions within the game to match personal desires. The importance of autonomy is its connection with motivation, that being if one has their freedom taken away, they will become less motivated to accomplish the task. Lastly, there is relatedness which is the connection to others and experiencing care. When it comes to video games, this would be the interpersonal relationships built through games and the relationships with characters within the game (Ryan et al., 2006; Kümpel & Unkel, 2017).

The idea that gaming-specific features might help satisfy the need for autonomy, competence, and relatedness has all been connected to eudaimonic well-being (Przybylski et al., 2010). For example, Reer and Krämer (2018) found that joining a persistent gaming community strengthens the potential of digital games to facilitate eudaimonic well-being through need satisfaction. Such groups provide multiple opportunities to interact with fellow players, improve

one's game skills, participate in offline events, and to organize and manage the community, thereby achieving autonomy, competence, and relatedness.

Meaningfulness

The experience of meaning has a multitude of associated concepts, such as meaningfulness, feelings of meaning, value, resonance, and purpose (Delle Fave, 2011; Huta, 2017; Steger, 2012). In particular, meaning and purpose have been linked to *eudaimonic orientation* (which signifies what a person seeks in life and why, including values, priorities, motives, ideals, and goals that guide a person's decisions) and the individual's actual *behavior* (Huta & Waterman, 2014). Interestingly, other studies refrain from pinning down a definition of meaningfulness, instead viewing the concept as specific to the individual. For example, Oliver and Raney (2011) claim that meaningfulness is distinct from pleasure, but never directly define the term. Oliver et al. (2016) draw a connection to meaningfulness and insight but point out that what people find meaningful or insightful can range drastically and allow the respondents to craft their own conceptualization of meaningfulness. Raney et al. (2018) offer a middle ground, highlighting that there is no specific thing or genre, but rather an experience of meaningfulness.

Despite this ambiguity, there are common concepts that appear across research domains that should be used to examine the concept of meaningfulness. One of the original works examining feelings of meaningfulness (Oliver, 2008, p. 44) referred to meaningfulness as “tender affective states” that might be used as an expression “to represent the feelings associated with human connectedness”. According to this argument, sad films featuring poignant portrayals of human connection force audience members to grapple with questions of life's purpose. Results showed that viewers' motivations for consumption might reflect alternative means beyond enjoyment. They seek meaningfulness within their messages.

With the goal of expanding our understanding of meaningful content beyond hedonic motivation, Oliver and Bartsch (2010) presented the concept of appreciation, which is "the perception of deeper meaning, the feeling of being moved, and the motivation to elaborate on thoughts and feelings inspired by the experience" (Oliver & Bartsch, 2010, p.76). It is argued that appreciation or meaningfulness may better signify the pleasures associated with serious, poignant, and pensive media content. Oliver and Raney (2011) continued this work and conducted four studies designed to conceptualize and develop eudaimonic scales in order to show that entertainment can be used as a means of wrestling with questions of life purpose and meaningfulness. Together, these studies found that along with watching films for fun and pleasure, individuals could choose entertainment for purposes of greater insight and meaningfulness (such as a serious or poignant entertainment offering) because it allows them to reflect on the purpose of life.

Research on meaningfulness has expanded into video games. In this literature, "meaningfulness" is often interchangeable with "appreciation" and "eudaimonia", often defined as experiences that go beyond hedonia. Some studies propose that these meaningful experiences co-occur with emotionally moving and reflective moments within the game. For example, Oliver et al. (2016) requested participants' recollections of a meaningful game experience centered around narrative elements, social relatedness, personal insight, and appreciation of the experience. Daneels et al. (2020) found that many adolescents defined meaningful gaming experiences as being emotionally moving and reflecting. Bowman et al. (2016), defined meaningful game experiences as experiences of poignancy and reflection.

This literature also presents two other conceptualizations of meaningfulness: one by which players attach individual meaning to the in-game experiences more broadly, and another

by which players make direct connections between in-game experiences and out-of-life struggles. Concerning the first conceptualization, these meaningful experiences are filtered through a player's personal world (Conway & Elphinstone, 2019). These experiences help clarify real-life situations and allow for a deeper psychological understanding of everyday situations (Arbeau et al., 2020). Others (e.g., Rogers et al., 2017), found that meaningful experiences result from the achievement of eudaimonic needs, such as understanding one's true self and insight into the human condition. Abeele et al. (2020) described meaning as one of the psychological outcomes of gaming, saying meaning resonates with what is essential, relevant, or valuable in a player's real-world environment. Similarly, Iten et al. (2018) labeled meaningful choices in video game stories as being emotional, morally ambivalent, and personally significant.

The second conceptualization is typically in studies that argue gaming experiences are meaningful when they provide gamers with a sense of purpose during times of struggle. For example, Iacovides and Mekler (2019) found that those who temporarily turned to games during trying life situations were provided with a lifeline in times of doubt, giving them meaning and achievable goals both within and outside of the game. Other studies (Colder Carras et al., 2018; Daneels et al., 2020) found that meaningfulness came when games provide insight into individuals' personal lives or allow for in-game situations to be applied to real-life situations.

Connection

Eudaimonic effects research uses various terms to describe the feeling of connection, such as social capital (Gilbert et al., 2013), social support (Gleason & Iida, 2015), and relatedness (Ryan & Deci, 2001). These studies all tend to measure connection as an assessment of functioning, possibly due to the social nature of human beings. An important outcome associated with viewing eudaimonic content is how it affects our perceptions of and interactions

with others. In this respect, research commonly reinforces the idea that individuals experiencing eudaimonic effects report positive perceptions of others and increased feelings of connection. For example, Zickfeld et al. (2019) presented the concept *kama muta* to refer to feeling moved or touched by witnessing a display of love or a communal relationship. While validating the measures of the concept, the authors reported that individuals watching moving content reported high motivation to hug or express love towards another person. These feelings of connection go beyond individuals and can be felt towards humankind as well. Aquino et al. (2011) demonstrated this when their participants reported favorable views of the world after reading an inspiring news story about the generosity of the Amish after a mass shooting.

Video games offer a unique opportunity for connectedness due to the affordances they offer, such as multiplayer gaming, control over gameplay mechanics and narratives, and the general social nature of gaming (Bowman et al., 2013). The notion of “connection” in gaming research has been referred to as “socialization”, “togetherness”, “relatedness”, “closeness”, and “character attachment”. The majority of this research revolves around interacting with other players. For example, Kümple and Unkel (2017) found that when individuals experienced high relatedness during gameplay, it predicted higher levels of eudaimonic experiences. In a similar vein, Daneels et al. (2020) found that adolescent players mentioned that socially connecting gaming experiences were eudaimonic in nature. Other gaming studies dealing with the concept of connectedness examined how individuals seek out connection when dealing with a complex life crisis. For example, Iacovides and Mekler (2019) found that people will utilize gaming to meet others with a shared interest, providing a sense of belonging through meaningful social interaction. Caro and Popovac (2021) had similar findings showing that individuals use games as means of connection and support seeking, which can lead to positive social effects.

Though the most common, connection with others is not the only way gamers can feel a sense of belonging. Recent research has found that players can develop relationships with both playable and non-playable characters in the game, leading to eudaimonic experiences. Bowman et al. (2016) found that an increase in attachment to the character through identification and responsibility was positively associated with eudaimonic experiences. In a previous study, Bowman et al. (2015) discovered that gamers would treat their in-game avatars as social companions and tend to do so in a way that is recognized as eudaimonic. The players in question responded to their avatars in a manner that would deem them authentic and differentiated social agents. Coanda and Aupers (2021) analyzed non-playable characters and found that players can develop meaningful socially connecting experiences, especially if the characters contain humanizing characteristics, as seen in games like *The Witcher and Dragon Age*.

Mediators of Eudaimonic Effects

It is clear that entertainment research now identifies that entertainment can produce both pleasurable and meaningful experiences across multiple media platforms, including video games. Video games could play a role in experiencing eudaimonic effects by affording opportunities for engagement, immersion, and interaction. Traditionally, approaches to video game research have revolved around adverse effects, specifically violence (Prescott et al., 2018), addiction (Mentzoni et al., 2011), and depression (Andreassen et al., 2016). Though it is critical that we examine these effects to gain a holistic understanding of the medium, more attention needs to be paid to the platform's potential prosocial effects.

Over the past decade, research has recognized this gap and begun documenting the potential positive impact of gaming on exercise (Maillot et al., 2014), enjoyment (Colder Carras et al., 2018), leisure (Brooks et al., 2016), and mental health (Jones et al., 2014) among other

prosocial topics. However, little research has been done to examine the relationship between the immersive nature of video games and prosocial or eudaimonic effects. It seems that possible the player's sense of immersion might facilitate eudaimonic effects. Achievement of such effects assumes that game players are engaged and/or involved in the content. High levels of engagement, sometimes referred to as "flow", are not uniform across players or games, and often depend on the realism of the content (Daneels et al., 2018; Hur & Lim, 2021). Though one would assume aspects such as flow or realism would play an intricate role in the development of these effects, no research (as yet) has examined those relationships.

Flow

Video games differ from legacy media, such as movies and television, in that individuals are a more interactive audience, actively controlling gameplay outcomes (Qin et al., 2009). A common theme amongst game players is the enjoyment one experiences due to the feeling of immersion and escape, which absorb them into the gaming world. While playing a game, individuals tend to lose track of themselves and their surroundings, which is known by a multitude of different terminology such as "presence", "immersion", "transportation", or "flow". Csikszentmihalyi and LeFevre (1989) introduced this concept as the "process of optimal experience" as an account of everyday pleasures and activities. It is described as a mental state in which a person is fully immersed in an activity characterized by energized focus, intense attention, full involvement, and perceived skill or success in the process of encountering challenges. It is then described as an experience so rewarding that it can lead to individuals partaking in the activity without any external rewards from the task. This immersive power is particularly intriguing regarding eudaimonic effects.

With each of these elements commonly found in video games, it is no wonder the platform consistently places individuals in a state of flow. These games are designed to require interactive involvement and provide feedback while also keeping the balance between difficulty and skill (Weibel et al., 2008). However, there are deeper criteria that must be present in order for a game to place an individual in this state. First, the game must provide concrete rules that are explained within the game so the player can continue learning and developing skills as they continue playing. Second, the game must meet the player's level of challenge and adapt as the game progresses. If a game is too easy, the player will become bored; if it is too challenging, the player will become frustrated. Both prevent the individual from experiencing a flow state. Third, it must provide immediate and consistent feedback in a number of different ways in order for the player to feel as if they are advancing properly through the game. Finally, it must assist players in ignoring the natural world and increasing focus on the game through visual, auditory, and tactile stimuli (Sherry, 2004). Hence, flow is not a continuous construct. There is not a gradual transition from a no-flow state into a flow state. The transition is sudden and likely due to the high absorption level from a flow-inducing task (Weber et al., 2016).

A number of studies have examined the characteristics that create and maintain a flow experience with video games (Sherry, 2004), including presence (Jin, 2011), performance (Jin, 2012; Keller & Bless, 2008), and difficulty (Schmierbach et al., 2014; Weibel et al., 2008). There have also been multiple studies looking at the impact of video games on eudaimonic experiences (Arbeau et al., 2020; Bowman et al., 2016; Oliver et al., 2016). These studies show that video games can influence feelings of eudaimonia. To date, no study has examined a possible connection between eudaimonic gaming experiences and flow. This could lead one to assume the experience of flow would impact an individual's eudaimonic experience. It is possible that

achieving a flow state increases the likelihood of a eudaimonic effect. A player who is transported by gameplay interactions might more easily encounter eudaimonic outcomes. If a game player does not experience a flow state (perhaps through boredom or frustration with gaming devices), the person would lose interest and purge the memory of the game, decreasing the chance that they experience eudaimonia. This leads to the hypotheses:

H1: A eudaimonic effect will be more likely when the individual is in a greater state of flow.

Realism

A primary attribute and critical aspect in order to experience this aforementioned flow state is the realism present within the game. Undoubtedly, video games have evolved exponentially over their lifetime from iconic games such as “*Spacewar!*” and “*Pong*” to their modern-day counterparts such as “*It Takes Two*” and “*The Last of Us*.” It is now commonplace to expect graphics and behaviors to produce feelings of awe while gaming. With these rapid advancements in gaming software, we need look no further than five years ago to see massive steps in-game quality. In the past, the drawback of games was reliance on scripted behaviors and events, limiting the realism and causing players to lose immersion and believability (Gruenwoldt et al., 2005). However, thanks to the advances in technology, modern games have the ability to develop morally complex narratives coupled with remarkable graphical and behavioral realism. Krcmar et al. (2011) argued that increased realism will lead to more significant effects.

Early research on realism in gaming centered around the harmful effects of violent video games. Many studies focused strictly on graphic realism, which is how a game displays persons, places, and things (McGloin et al., 2011). For example, Jeong et al. (2012) examined the influence of graphic realism, such as blood color, realistic screams, and the player’s perspective

on physiological arousal and presence within violent video games. Results indicated that individuals who played a more realistic game showed more verbal aggression due to the fact it had a higher ability to make the player feel as if they were present in the game. In another study aimed at violent realism, Krcmar et al. (2011) looked at the difference in aggression levels between players who partook in playing *Doom 1* vs. *Doom 3*. Results showed that players who played the more technologically advanced title (*Doom 3*) showed higher verbal and physical aggression scores than those who played *Doom 1* or no game. While these are negative effects, they show that heightened effects occur when greater realism is experienced.

More recent research has begun looking at perceived realism, or the extent to which an audience assesses how realistic a media text or message is (Potter, 1986). This perception has been forwarded as an essential concept to understand the gameplay experience regarding its effects and attributions (Daneels et al., 2018; Ribbens et al., 2016). Subsequent research has also pointed out that game narrative and ludic characteristics should also be viewed in equal importance to graphical realism (Breuer et al., 2012; Lin & Peng, 2015; Ribbens et al., 2016). For example, gamers will seek out consistency within the game world, as well as the credibility of the dialogue or events, to assess the game's realism (Malliet, 2006).

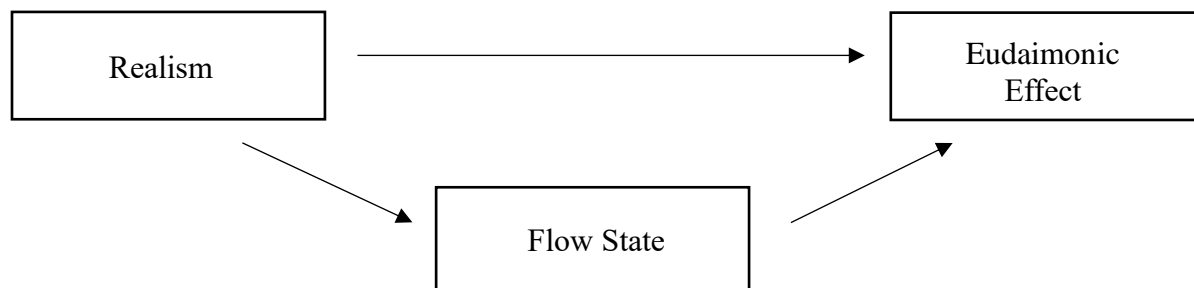
Hence, players evaluate a game based on a multitude of criteria. Ribbens et al. (2016) proposed a five-dimensional model of perceived realism: character involvement (the degree to which players consider their avatar an extension of their real-life selves), perceptual pervasiveness (the absorbing qualities of graphics and audio), social realism (the degree to which in-game characters and events resemble real-life people and events), freedom of choice (the extent to which game choices reflect real-life choices) and simulated realism (how the programmed rules of a game facilitate virtual behavior that resembles real-life behavior).

Given this literature, an examination of realism's connection to a flow state and eudaimonic effects is warranted. Recent research shows realism can play a role in the experience of flow, with both graphics and character behavior impacting this effect (Daneels et al., 2018; Hur & Lim, 2021), which would lead one to think realism would then indirectly lead to a eudaimonic effect. With current technological advancements, we are seeing massive strides in terms of gaming realism. Not only are gamers demanding games with higher levels of graphic realism, but we also see an increase in the demand for perceived realism. We should also expect that gamers will become accustomed to games with heightened levels of realism, leading them to be less accepting of games not deemed to meet their standard. Looking at Ribbens et al. (2016) five dimensions of perceived realism, it would seem that the elements would be necessary components for a heightened game experience. That being, if the players do not believe the game is realistic, they may not enter the flow state or experience a eudaimonic effect (Figure 1). However, there has been minimal research on the exploration of this relationship. The possible indirect relationship between realism, flow, and eudaimonic effects leads to the following:

H2: A eudaimonic effect will be more likely when the level of realism is higher.

RQ1: Does flow state mediate the relationship between realism and eudaimonic effects?

Figure 1: Proposed Theoretical Model



Chapter 2: Methods

To test these hypotheses, a quasi-experiment (with no control group) was conducted. Participants were recruited from a range of communication courses (from lower-level undergraduate through graduate courses) at the University of Arkansas. Recruitment was done through a verbal class announcement and an email offering extra credit that was decided by the course instructor. Within the email announcement, participants were sent a link that allowed them to sign up for a 30-minute time slot in the Center for Communication Research. Upon entering the lab, participants were asked to sign in using their name, course, section number, instructor, and student ID number. None of this information was connected to participant data. This study's research design was approved by the UA Institutional Research Board (see Appendix A for approval documents).

Participants

There were 193 participants, including 67 people that identified as male (34.7%) and 126 that identified as female (65.3%). The average age of participants was 19.56 ($SD = 2.11$), with a range of 18-38. Seven (3.6%) identified as Black/African/African American, 6 (3.1%) as Asian, 14 (7.3%) as Hispanic, 1 (0.5%) as Native American, 2 (1.0%) as Pacific Islander, 146 (75.6%) as White/Caucasian, and 18 (9.3%) as multiracial. One hundred and one participants (52.3%) reported 0 hours of weekly gameplay, 51 (26.4%) reported 1-4 hours, 26 (13.5%) reported 5-8 hours, and 15 (7.8%) reported 9+ hours. No participants marked having played *Elude* in the past (0%), 19 (9.8%) marked having played *The Last Of Us Remastered*, 172 (89.1%) marked that they had played neither game, and 2 (1.0%) individuals did not respond to this question.

Stimulus Material

The study used two single-player games as stimulus material: *Elude* (Singapore-MIT Gambit Game Labs, 2010) and *The Last of Us Remastered* (Naughty Dog, 2014). These two games were chosen due to previous research highlighting effects that would be considered eudaimonic (Anderson, 2022; Rautalahti, 2019; Rusch, 2012) while also presenting different levels of realism in regard to visuals, mechanics, and behavior (for still images of the game, please see Appendix B).

Elude was released in the summer of 2010 and developed by Singapore-MIT Gambit Game Labs. The game aims to raise awareness about depression and inform players about the illness. Specifically, it is designed for a clinical context as part of a psycho-education package to enhance friends' and relatives' understanding of those suffering from depression and what their loved ones are experiencing. *Elude* models what depression feels like by contrasting it with other mood states, such as normal and happy. The various parts of the game represent emotional landscapes that correspond to different moods, with the gameplay changing according to mood changes. The core gameplay (i.e., "normal mood") happens in a forest filled with "passion" objects that resonate and act as power-ups when one calls out to them. Only when infused with passion is it possible to overcome the obstacles on the way to the treetops, where one reaches "happiness." However, this feeling quickly fades and sends the player back to the forest before they are quickly dragged below the soil to symbolize despair. The gameplay is highly metaphorical and lasts roughly 8-9 minutes in its entirety. Rusch (2012) highlighted the game's accuracy and effectiveness in representing the states of depression. Feedback from friends and relatives in the experiment was quite positive, such as this player's reaction:

This game communicated something to me no one could explain to me before. It is terrible when suddenly control is taken away from you in the game. There is nothing you can do. It makes much more sense to me now, what my depressed son/daughter/boyfriend/wife tried to tell me before about his/her experience. It makes me sad, but I understand it better now. (p. 256)

Rusch also reported that participants who struggled with depression provided further feedback along the lines of: “Yes, this is what it feels like” (Rusch, 2012, p. 256).

Though this game does contain a level of realism in terms of feeling, it does not act or look in a manner that would be deemed realistic. The gameplay itself is that of a 2D side scroller that allows players to jump through trees and bounce on leaves.

The Last of Us Remastered is an action-adventure game released in July of 2014 developed by the gaming studio Naughty Dog and is available to download for free with a PS+ membership through Sony's PlayStation store. The game has received 11 awards, including the BAFTA Games Awards for Best Game, Performer, Audio Achievement, and Story, as well as the VGX best performance by a human male. These awards highlight the game's high levels of acting and realism. This study used the fifteen-minute prologue mission from the game, where we see the protagonist, Joel, and his daughter spending time together in their home. After a short non-interactive segment designed to advance the narrative, the player takes control of the girl and looks around the house as the game's central dilemma unfolds. The two are forced to run from infected humans. After running through the streets and escaping the pursuers, the two meet a member of the military ordered to prevent people from leaving the town. An argument ensues and the military character is ordered to execute Joel and his daughter. The prologue ends with Joel's wounding and his daughter's death.

Throughout the mission, the player experiences many different story aspects through dialogue and actions of the characters that could cause feelings beyond pure hedonic enjoyment.

Witnessing the lighthearted bond between a father and daughter early in the mission and then watching the father do everything he can to ensure his daughter's safety, which eventually leads to heartbreak with her death in his arms, may have the ability to lead to a eudaimonic effect. Some research on this game (Anderson, 2022) found that it increased players' empathy and prosocial beliefs, with players highlighting the game's character mannerisms and emotional expressiveness as profound and realistic. Rautalahti (2019) found that the game changed players' worldview, with one player remarking:

I was completely in shock how Naughty Dog conveyed the feelings of a post-apocalypses. I was shocked how used to I got to Joel and Ellie. This is not just a game. It means a lot for me. Thank you, Naughty Dog. (p. 15)

This evidence indicates that the game has an impact on individuals past the state of hedonic enjoyment and creates an experience that one could deem eudaimonic. *The Last of Us Remastered* also contains a higher level of realism as its visuals, mechanics, and behaviors act in a manner that would be deemed realistic compared to *Elude*. The gameplay itself is in 3rd person, with characters holding realistic conversations and displaying normal human movement.

These games were played in the Center for Communication Research, with *Elude* being played via computer and keyboard and *The Last of Us Remastered* being played via a Sony PlayStation console and controller. Both games had simple controls that permit inexperienced gamers to progress through the story.

Procedure

Participants were randomly assigned to play the unrealistic game (*Elude*) or the realistic game (*The Last of Us Remastered*). After filling out their demographic information along with a prescreening to know previous interactions with the two gaming stimulants, participants then

played until they completed the game (*Elude*) or finished the first mission (*The Last of Us*). In the case of *Elude*, they were informed of the game's purpose, as this is critical to understanding the meaning of gameplay (Rusch, 2012). The same was not done for *The Last of Us*, as this is not critical for understanding the game. Following gameplay, participants were asked to complete a survey that measures the study's focal variables. At the conclusion of the study, their identifying information was shared with their course instructor to facilitate awarding of course credit for their participation.

Measures

Hedonic Enjoyment and Eudaimonic Appreciation Scale

The hedonic enjoyment and eudaimonic appreciation scale (Oliver & Bartsch, 2010) includes 12 items (Appendix B) that measure hedonic and eudaimonic effects of watching films. The items ask respondents to indicate their level of agreement (on a 7-point Likert scale ranging from “strongly disagree” to “strongly agree”) with a series of statements that measure four player reactions: fun (3 items, $\alpha = .96$), moving/thought-provoking experience (3 items, $\alpha = .84$), lasting impression (3 items, $\alpha = .91$), and suspense (3 items, $\alpha = .92$). For example, to measure how moving a participant viewed a game, the question, “I was moved by this video game,” would be asked. Oliver and Bartsch (2010) and Oliver et al., (2016) also established the scale's predictive and ecological validity. Though this scale has been primarily used to look into the eudaimonic effects of film (Wang, 2014; Wirth et al., 2012), it has also been adapted to other media platforms, including television (Roth et al., 2018), online video (Schneider et al., 2016), and video games (Oliver et al., 2016; Possler et al., 2020; Taylor & Shafer, 2019).

Flow Experience

The flow experience in computer gameplay scale (Feng, 2013) is a 23-item self-reported measure that uses a 7-point Likert-type scale ranging from “strongly disagree” to “strongly agree.” The scale is designed to measure six dimensions of flow (Appendix C) and produced a satisfactory overall reliability score ($\alpha = 0.87$). Within the scale, the dimensions are a challenging activity that requires skill (4 items), immersion (6 items), clear goals and feedback (6 items), concentration on the task at hand (2 items), the paradox of control (2 items), and autotelic experience (3 items). Examples of these items would include, “I lost the consciousness of my identity and felt like I was ‘melted’ into the game” for immersion and “Playing this game is rewarding in itself” for autotelic response. This scale also holds a satisfactory level of criterion and construct validity (Feng, 2013). Three elements in flow theory (loss of self-consciousness, the merging of action and awareness, and the transformation of time) were perceived by game players as one factor (immersion), demonstrating game players’ experience of a flow state.

Perceived Realism

The perceived game realism scale (Ribbens et al., 2016; see Appendix D), is a five-dimensional model consisting of a 20-item self-reported measure that uses a 7-point Likert-type scale ranging from “strongly disagree” to “strongly agree”. Examples of these items include, “This game created an absorbing visual experience” for perceptual pervasiveness and “By playing this game, I can learn something about the real world” for simulational realism. The model measures perceived realism and its effects in shooting games. However, the theoretical underpinnings of the five dimensions were developed by references to complex virtual worlds such as *Half-Life 2* (Ribbens, 2013) and *Everquest* (Shapiro & Peña, 2009), so the scales structure will accurately apply to other genres such as role-playing games and adventure games

(Wang & Hsieh, 2018). The scale's reliability in this study was satisfactory ($\alpha = 0.90$). In terms of validity, Ribbens (2013) and Ribbens et al. (2016) established predictive and construct validity.

Data Analysis

All data analysis was completed using the IBM Statistical Package for the Social Sciences. To test H1, a linear regression analysis was employed to examine the experience of eudaimonia and the necessity of a flow state. To test H2, a linear regression analysis was also used, but this time to examine the experience of eudaimonia and its connection to realism. To answer RQ1, a hierarchical regression analysis was run to examine the influence of realism and flow. Control variables (age, gender, and hours of gameplay per week) were entered into Block One, perceived realism was entered into Block Two, and flow was entered into Block Three. This order was chosen in order to properly analyze the research question relating to flow state being the mediator between realism and eudaimonia. That being, in order to investigate if flow state is a moderator, we would need to see if adding it to the model after realism would mitigate its effect.

Chapter 3: Results

Before testing the hypothesized relationships, two preliminary tests were conducted. First, an independent t-test was conducted to determine if participants saw a difference in the realism of *The Last of Us Remastered* ($M = 96$, $SD = 4.14$) vs. *Elude* ($M = 96$, $SD = 3.66$). Levene's test for equality of variance was not significant ($F = .995$, $p < .32$), so equality of variance can be assumed, $t(188.25) = -3.43$, $p < .001$. This means that participants did perceive a significant difference in realism between the two games. Given these results, subsequent tests did not include game title as a variable for analysis.

Second, zero-order correlations were conducted for all variables in the regression model (Table 1). Results showed that the measures of flow and realism were correlated with hedonic fun, eudaimonic movement, eudaimonic lasting impression, and eudaimonic suspense. Hours per week were also correlated with flow, hedonic fun, and eudaimonic moving. Based on these results, all variables were retained for further analysis.

Table 1: Zero-Ordered Correlations

Variable	Age	Hrs/Week	Flow	Realism	Hed. Fun	Eud Mov	Eud Last Imp	Eud, Susp
Age	-							
Hrs/Week	.24**	-						
Flow	-.03	.15*	-					
Realism	-.06	-.05	.69**	-				
Hed. Fun	.02	.14*	.67**	.50**	-			
Eud Mov.	.01	.20**	.55**	.57**	.59**	-		
Eud Last Imp.	-.003	.07	.56**	.61**	.55**	.68**	-	
Eud Susp.	-.04	-.07	.48**	.47**	.46**	.25**	.53**	-

N = 193, * $p < .05$. ** $p < .01$

Next, a hierarchical linear regression analysis was conducted to test H1, which predicted that participants' perception of being in a flow state would be positively related to hedonic and eudaimonic effects (hedonic fun, eudaimonic moving, eudaimonic lasting impression, eudaimonic suspense). The linear combination of flow and hedonic fun was significant: $F(5, 186) = 31.90, p < .001$. The sample multiple correlation coefficient (R) was .68, indicating that an individual's flow level can account for approximately 31.9% of the variance of hedonic fun. The linear combination of flow and eudaimonic moving was also significant: $F(5, 186) = 25.07, p < .001$. The sample multiple correlation coefficient (R) was .63, which indicates that approximately 25.1% of the variance of eudaimonic moving can be accounted for by an individual's level of flow. The linear combination of flow and eudaimonic lasting impression was also significant: $F(5, 186) = 26.54, p < .001$. The sample multiple correlation coefficient (R) was .65, which indicates that an individual's level of flow can account for approximately 26.5% of the variance of eudaimonic lasting impression. The linear combination of flow and eudaimonic suspense was also significant: $F(5, 186) = 14.79, p < .001$. The sample multiple correlation coefficient (R) was .53, which indicates that an individual's level of flow can account for approximately 14.8% of the variance of eudaimonic suspense.

A hierarchical linear regression analysis was also conducted to test H2, which predicted that participants' perception of realism would be positively related to hedonic and eudaimonic effects (hedonic fun, eudaimonic moving, eudaimonic lasting impression, eudaimonic suspense). The linear combination of realism and hedonic fun was significant: $F(4, 187) = 19.31, p < .001$. The sample multiple correlation coefficient (R) was .54, indicating that an individual's perceived realism level can account for approximately 19.3% of the variance of hedonic fun. The linear combination of realism and eudaimonic moving was also significant: $F(4, 187) = 28.2, p < .001$.

The sample multiple correlation coefficient (R) was .61, which indicates that approximately 28.2% of the variance of eudaimonic moving can be accounted for by an individual's level of perceived realism. The linear combination of perceived realism and eudaimonic lasting impression was also significant: $F(4, 187) = 29.75, p < .001$. The sample multiple correlation coefficient (R) was .62, which indicates that an individual's level of perceived realism can account for approximately 29.8% of the variance of eudaimonic lasting impression. The linear combination of perceived realism and eudaimonic suspense was also significant: $F(4, 187) = 13.74, p < .001$. The sample multiple correlation coefficient (R) was .48, which indicates that an individual's level of perceived realism can account for approximately 13.7% of the variance of eudaimonic suspense.

A hierarchical multiple regression (Table 2) was conducted to address the question of how the independent variables were related to each dependent variable (hedonic fun, eudaimonic moving, eudaimonic lasting impression, eudaimonic suspense). Overall, the model accounted for 44.7% of the total variance on hedonic fun effects. The first block of control variables only explained 2.1% of the variance ($F(3,188) = 1.33, p = .27$), and no factors contributed significantly to the regression model. Introducing realism an additional 27.2% of the variance ($F(1,187) = 71.78, p < .001$), and perceived realism was significantly related to hedonic fun effects. Adding flow to the regression model explained an additional 16.9% of the variance in hedonic fun ($F(1,186) = 31.90, p < .001$), and only perceptions of a flow state were significantly related to hedonic fun.

Table 2: Hierarchical Regression Analysis of Factors Related to Hedonic Fun

Variable	B	SE	β	Adj. R^2	ΔR^2
Step 1				.005	.021
Age	-.01	.06	-.01		
Gender Identification	-.09	.30	-.03		
Hours of weekly gaming	.22	.15	.13		
Step 2				.277	.272
Age	.005	.05	.007		
Gender Identification	-.44	.26	-.13		
Hours of weekly gaming	.15	.13	.09		
Realism	.85	.10	.53**		
Step 3				.447	.169
Age	.02	.04	.03		
Gender Identification	-.42	.23	-.12		
Hours of weekly gaming	-.03	.12	-.02		
Realism	.19	.12	.12		
Flow	1.09	.14	.59**		

N = 193; p < .05, ** p < .01, *** p < .001

Now looking at eudaimonic moving, the model accounted for 38.7% of the total variance. The first block of control variables only explained 0.4% of the variance ($F(3,188) = 2.64$, $p = .051$), and no factors contributed significantly to the regression model. By inserting realism an additional 33.6% of the variance ($F(1,187) = 100.86$, $p < .001$), and perceived realism was significantly related to eudaimonic moving effects. Introducing flow to the regression model explained an additional 2.6% of the variance in eudaimonic moving ($F(1,186) = 25.07$, $p < .001$), and both perceptions of realism and flow state were significantly related to eudaimonic moving.

Table 3: Hierarchical Regression Analysis of Factors Related to Eudaimonic Moving

Variable	B	SE	β	Adj. R^2	ΔR^2
Step 1				.025	.040
Age	-.02	.05	-.03		
Gender Identification	.06	.29	.02		
Hours of weekly gaming	.35	.22	.22		
Step 2				.363	.336
Age	-.008	.04	-.01		
Gender Identification	-.31	.23	-.10		
Hours of weekly gaming	.28	.12	.17		
Realism	.90	.09	.59**		
Step 3				.387	.026
Age	-.002	.04	-.003		
Gender Identification	-.30	.23	-.10		
Hours of weekly gaming	.21	.12	.13		
Realism	.66	.12	.43**		
Flow	.41	.15	.23*		

N = 193; $p < .05$, ** $p < .01$, *** $p < .001$

When looking at eudaimonic lasting impression, the model accounted for 40.1% of the total variance. The first block of control variables only explained 0.4% of the variance ($F(3,188) = 1.33$, $p = .266$), and no factors contributed significantly to the regression model. An additional 36.8% of the variance was introduced by adding realism to the model ($F(1,187) = 112.63$, $p < .001$), and perceived realism was significantly related to eudaimonic lasting impression. Adding flow to the regression model explained an additional 2.8% of the variance in eudaimonic lasting impression ($F(1,186) = 26.54$, $p < .001$), and both perceptions of realism and flow state were significantly related to eudaimonic lasting impression.

Table 4: Hierarchical Regression Analysis of Factors Related to Eudaimonic Lasting Impression

Variable	B	SE	β	Adj. R^2	ΔR^2
Step 1				.005	.021
Age	-.01	.06	-.01		
Gender Identification	.53	.31	.15		
Hours of weekly gaming	.29	.16	.17		
Step 2				.376	.368
Age	.007	.05	.009		
Gender Identification	.10	.25	.03		
Hours of weekly gaming	.21	.12	.12		
Realism	1.12	.10	.62**		
Step 3				.401	.028
Age	.01	.05	.02		
Gender Identification	.11	.24	.03		
Hours of weekly gaming	.13	.12	.08		
Realism	.74	.13	.45**		
Flow	.46	.15	.24*		

N = 193; $p < .05$, ** $p < .01$, *** $p < .001$

Lastly, the model accounted for 28.4% of the total variance on eudaimonic suspense. The first block of control variables only explained 0.3% of the variance ($F(3,188) = 2.02, p = .112$), and gender contributed significantly to the regression model. Introducing realism an additional 19.6% of the variance ($F(1,187) = 47.37, p < .001$), and perceived realism was significantly related to eudaimonic suspense. Adding flow to the regression model explained an additional 5.7% of the variance in eudaimonic suspense ($F(1,186) = 14.79, p < .001$), and only perceptions of realism and flow state were significantly related to eudaimonic suspense.

Table 5: Hierarchical Regression Analysis of Factors Related to Eudaimonic Suspense

Variable	B	SE	β	Adj. R^2	ΔR^2
Step 1				.016	.031
Age	-.02	.07	-.02		
Gender Identification	.80	.36	.20*		
Hours of weekly gaming	.09	.18	.05		
Step 2				.211	.196
Age	.001	.06	.001		
Gender Identification	.44	.33	.11		
Hours of weekly gaming	.03	.16	.01		
Realism	.87	.13	.45**		
Step 3				.265	.057
Age	.01	.06	.01		
Gender Identification	.46	.32	.112		
Hours of weekly gaming	-.11	.16	-.05		
Realism	.41	.17	.21*		
Flow	.78	.20	.34**		

N = 193; p < .05, ** p < .01, *** p < .001

Chapter 5: Discussion

This study examined if the presence of flow and realism while playing video games act as mediators in the experience of eudaimonic effects. Specifically, this study investigated two hypotheses and one research question developed from existing literature on three potential eudaimonic effects of video game play. This chapter provides a discussion of the various implications and limitations of this research. In the following sections, I will outline the hypotheses and research question, discuss theoretical and practical implications, and explore opportunities for future research.

Theoretical Implications

Theoretically, this study continues to build on previous works (Oliver, 2008; Oliver & Raney, 2011), which posed that there are more profound impacts from media beyond hedonic enjoyment. Key findings show that individuals not only derive pleasure from video gameplay but are also experiencing eudaimonic effects such as emotional movement, feelings of a lasting impression, and feelings of suspense. Overall, these discoveries are in accordance with findings reported by Oliver et al. (2016) and Taylor and Shafer (2019) which showed that video games can providing individuals with eudaimonic experience.

These results also open a new avenue into eudaimonic research. Much of the current work looks into outcome variables of media exposure but fails to examine the impact of predictor variables. By exploring not only the impact of flow and realism but other factors, we will continue to develop a deeper understanding of eudaimonic experiences during video game play. This deeper understanding could allow not only us as researchers, but video game developers and players to have more control over what will and won't lead to the eudaimonic outcomes common in this line of research. These sentiments should not stay in the realm of

gaming either, as future research will need to expand these concepts in various other media platforms.

This study hypothesized that a eudaimonic effect would be more likely when the individual is in a state of flow. This hypothesis was supported with the regression analysis showing that the experience of flow significantly contributed to the experience of both hedonic and eudaimonic effects. What these findings establish is a connection between the concepts that had yet to be examined in either flow or eudaimonic research. As previously mentioned, many studies have examined the independent relationships of flow (Schmierbach et al., 2014; Sherry, 2004) and eudaimonia (Bowman et al., 2016; Oliver et al., 2016) in reference to video games, and this study continued to build upon those theoretical frameworks. This finding leads us to a new understanding of the importance of flow when studying eudaimonic effects. This finding also supports the notion that when researchers or video game players want to promote hedonic or eudaimonic effects, it is paramount that they ensure a state of flow will be reached by making sure the games lead players to feel energized focus, intense attention, full involvement, and perceived skill or success in the process of encountering challenges.

The second hypothesis examined was that a eudaimonic effect would be more likely when the individual perceives a game is realistic. This hypothesis was supported by the regression analysis showing that realism significantly contributed to the experience of each eudaimonic effect. In a similar vein as flow, multiple studies have examined the role of realism in video game play (Busselle & Bilandzic, 2008; Ribbens et al., 2016). Those studies generally found that realism play's an important role in explaining the mental processes underlying gameplay and media effects, but typically focused on the adverse effects such as violence and aggression or hedonic effects.

To date, though, realism has not been tested as a necessary step to experiencing hedonic or eudaimonic effects. This study's results showed a moderately high beta coefficient, which begs the question of why something so impactful on the gaming experience had yet to be associated with these effects. This might be due to outcome-centric research that should be expected with such a new phenomenon. Nevertheless, this is a crucial finding of this research, with the evidence of the connection pointing towards realism being a major contributor to eudaimonia. Such a finding leads one to advance that if one wanted to experience or induce a eudaimonic effect, it would entail an element of realism to be present within the game.

It is also worth discussing an interesting data point revealed by the regression analysis, specifically that realism did not play a significant role in hedonic enjoyment. On the surface, this seems obvious, as previous generations enjoyed the simplicity of games such as *Pong*, *Pac-Man*, and *Tetris*. However, this goes against the notion that video game players are now searching for realistically advanced games (Shafer et al., 2014). Alternatively, this could simply mean that video game players still do not need realistic gameplay mechanics to have fun. Future explorations into hedonic motivations and realism may want to expand upon these findings.

Lastly, this study asked if a flow state mediated the relationship between realism and eudaimonic effects. The results of the regression analysis showed mixed findings. When it comes to eudaimonic moving and lasting impression, the flow state does not act as a mediator; instead, realism held a high beta coefficient. However, when looking at eudaimonic suspense, flow held the higher of the two beta coefficients. Together, the present findings would not lead one to believe flow is a mediating variable between realism and feelings of eudaimonia. Instead, at this time, these two might be viewed as distinct influences on eudaimonic effects. Considering this is an exploratory study, this relationship should be further evaluated in subsequent studies.

From these findings, it is clear that flow and realism play a significant role in the experience of eudaimonic effects. Beyond further testing on these two moderators, investigation into the countless other factors that could be affecting eudaimonic experience is necessary. Factors such as mood (Granic & Lobel, 2014), overstimulation (Pagani et al., 2022), current mental health state (Kowal et al., 2021), and tendencies for prosocial behavior (Li & Zhang, 2022) are just a few examples of the many possible moderators that could be impacting an individual's eudaimonic experience.

Limitations and Future Research

As with all exploratory research, this study had a number of limitations that provide opportunities for future research. First, the sampling and data collection were not representative of the current population of the gaming community. The study's demographics had an average age of 19.56, with 65.3% of respondents being female. As of 2022, the average age of a video game player was 33 and was nearly split fifty-fifty in terms of self-identified sex (ESA, 2022). A sample that accurately represented this demographic might display a high level of eudaimonic effect to elements of flow and realism as older individuals tend to look for more impactful media content and experiences (Benedetti, 2010). Though data on a subset of college students can be fruitful, future researchers should take these factors into consideration in order to provide data that mirrors our current society.

Another limitation is that 52.3% of participants who claimed not to play video games on a weekly basis. This percentage contrasts data that claims that 66% of Americans play video games weekly (ESA, 2022). This brings to light what might have been a sampling error on the researcher's part, as we speculate that this is due to the lack of clarification on the definition of a video game. Due to the participant's expectations of playing a video game on a console or PC,

they may have inferred that hours per week signified console or PC gaming when playing a game of *Chess* or *Candy Crush* on the phone would qualify. It is also possible that the sampled percentage could be accurate. However, the lack of clarity would need to be addressed in future iterations of this research so that conclusions could be drawn from such data.

Perhaps the most glaring limitation is that these games differed greatly from one another. These two games were chosen due to previous research highlighting effects that would be deemed eudaimonic (Rautalahti, 2019; Rusch, 2012). However, if one wanted to eliminate the game differences from impacting moderators such as flow and realism, two of the same or similar games would need to be utilized. Though this is a challenge, it should be easier for future research to execute as the demand for remastered versions of games and sequels is becoming more commonplace (i.e., *The Last of Us* and *The Last of Us Part II*).

With one of the games there is also an external factor that should be considered. In early 2023, *The Last of Us* became a highly popular television series pulling in millions of viewers per episode. Many participants stated that they love the show after playing the game. It would not be argued that even with the technological advancement of video games, they do not stack up to the realism present within a live-action television show which could have led some participants to view the graphics of *The Last of Us Remastered* game in a poorer light when compared. Future research may need to consider this factor if they desire to use a video game with a television or movie adaptation in a test of realism, as this is becoming more popular, as seen with titles such as *Uncharted* and *Tomb Raider*.

The time spent gaming also needs to be analyzed on a deeper level, as participants only played the first mission on *The Last of Us Remastered*. It is plausible to assume that the impact the game has on players would increase if they had completed the entire story instead of the

prelude. Future studies may want to gather individuals who have already played the entire game, similar to Anderson (2022) and Rautalahti (2019), or have the participants complete the game over multiple sessions to truly understand the impact of the game. Both of these games were also single-player platforms which are only half of the gaming landscape. This should lead one to question if these effects are as salient when it comes to multiplayer games. Future research should expand into this criterion which could be especially fruitful when looking into the outcome of connection and community. Though it can be argued that these two games can foster connection outside of gameplay through deeper understanding and appreciation for others (Anderson, 2022; Rusch, 2012).

One final limitation related to the utilized games is that they were not played using similar controls. Instead, one used a keyboard (*Elude*) and the other a controller (*The Last of Us Remastered*). Though it is not expected that this would play a significant role in the results as controls of each game were very simplistic and despite a few participants displaying frustration in learning the controls for both games, each participant completed the game. However, this frustration could have prevented a flow state in some users. These further highlight some inconsistencies between the two games and should be avoided.

Now looking at the scales used for this research, it is reasonable to draw attention to the simplicity of the eudaimonic appreciation scale. Though adaptations were used in previous lines of research (Oliver et al., 2016; Possler et al., 2020; Taylor & Shafer, 2019), it would seem to be beneficial to begin development on a less simplistic version allowing for more insight into each aspect of the scale. We also did not take into account one's trait level of eudaimonia (Huta, 2017) with a pretest, so we cannot be sure if certain participants were predisposed to experience heightened levels of eudaimonia. Results showed that it is clear that these games produced

feelings of eudaimonia directly after gameplay, but as this is a one-off study, there is no way to know if these games made a long-term impact.

Conclusion

The results of this study are significant because they show that certain elements present in video games, such as realism and flow, significantly contribute to a eudaimonic outcome. However, it is essential to highlight that these two factors do not alone explain the entirety of the variance that leads to these effects. A range of factors could also play a role that needs to be further tested to understand critical moderators present that lead to eudaimonic effects. This realization provides a potential mechanism that opens a new door that pushes for an understanding of eudaimonia within media platforms. In addition, it can also be assumed that the increased demand and ability for video games to put users in a flow state and have a high sense of realism are factors that should continue to impact eudaimonic effects significantly. These demands should also increase researchers' excitement as the gaming industry continues to advance, as this could be a particularly fruitful avenue for development. Studying these effects is important because of their potential implications for positive effects on individuals. If a game is going to provide eudaimonic effects such as a sense of meaning, well-being, or connection, it is critical that it provides elements of flow and realism to heighten the chances for effect on the user. As such, it is hoped this exploratory research will push toward future understanding of the gaming experiences, as we believe that doing so will continue to help dismiss the portrayal of games as shallow forms of entertainment and allow for a deeply inspiring experience.

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Appendix A



To: Brandon L Lawson
From: Douglas J Adams, Chair
IRB Expedited Review
Date: 02/14/2023
Action: **Exemption Granted**
Action Date: 02/14/2023
Protocol #: 2301446436
Study Title: Prerequisites to Eudemonic Effects in Video Games

The above-referenced protocol has been determined to be exempt.

If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.

If you have any questions or need any assistance from the IRB, please contact the IRB Coordinator at 109 MLKG Building, 5-2208, or irb@uark.edu.

cc: Ron Warren, Investigator

Appendix B

Elude:



The Last of Us Remastered:



Appendix C: Hedonic and Eudaimonic Effects Scale

Fun	It was fun for me to play this game.
	I had a good time playing this game.
	This game was entertaining.
Moving/Thought Provoking	I found this game to be very meaningful.
	I was moved by this game.
	The game was thought provoking.
Lasting Impression	The game will stick with me for a long time.
	I know I will never forget this game.
	The game left me with a lasting impression.
Suspense	I was at the edge of my seat while playing this game.
	This was a heart pounding type of game.
	This game was suspenseful.

Appendix D: Flow Scale

A Challenge Activity that Requires Skill	Playing this game challenges me.
	Playing this game could provide a good test of my skills.
	I find that playing this game stretches my capabilities to my limits.
	I was challenged by this game, but I believed I am able to overcome these challenges.
Clear Goal and Feedback	I knew clearly what I wanted to do in this game.
	I knew what I wanted to achieve in this game.
	My goals were clearly defined.
	While playing this game, I had a good idea about how well I was doing.
	I was aware of how well I was performing in this game.
	I receive immediate feedback on my actions.
Concentration on the Task at hand	My attention was focused entirely on the game that I was playing.
	When playing this game, I was totally concentrated on what I was doing.
The paradox of control	When playing this game, I felt in control over what I was doing in the game.
	I feel comfortable with the controls of this game.
Immersion	I often find myself doing things spontaneously and automatically without having to think.
	When I play the game, I feel I am in a world created by the game.
	I kind of forgot about myself when playing this game.
	I lost the consciousness of my identity and felt like “melted” into the game.
	When I played this game, I sometimes felt like things were happening in slow motion.
	When I play this game, I tend to lose track of time.
Autotelic Experience	Playing this game is rewarding in itself.
	I loved the feeling of that performance and want to capture it again.
	I enjoyed the experience.

Appendix E: Realism Scale

Character Involvement	While playing this game, I felt like I was present in the video game world.
	While playing this game, I felt that I was part of the video game world.
	While playing this game, I felt that the character was a part of me.
	While playing this game, I felt as if I was a part of the action.
Perceptual Pervasiveness	The picture quality of the game was overwhelming.
	Graphically, the game looked very impressive.
	This game created an absorbing visual experience.
Social Realism	The events in this game bear similarities with events in the real world.
	I perceive similarities between the events that occur in this game and the events that occur in real life.
	The things that happen in the game could occur somewhere in the real world.
Freedom of Choice	I felt I determined the course of the game.
	In this game I felt I was pulling the strings.
	I felt that I could choose my own path in the game world.
	While playing this game, I felt I was creating my own story.
	I felt I determined the outcome of the ending.
Simulational Realism	By playing this game, I feel better prepared for certain lifelike situations.
	By playing this game, I can learn how certain problems in the real world are solved.
	By playing this game, I can learn how to behave in real life.
	By playing this game, I can learn something about the real world.
	By playing this game, I can learn how to control certain real world situations.