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The People-Game-Play Model for Understanding Videogames' Impact on Wellbeing

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Abstract— Given the increasing popularity of videogames, understanding when, how and for whom they have a positive or negative impact on wellbeing is critical. We propose a model for exploring these questions based on existing literature and our own research. The People-Game-Play model identifies player characteristics, game features and the experience of play as key determinants of the impact of videogame play on wellbeing. We propose research exploring the relationships within and between each of these key factors is needed and identify some examples of future research in this space.

Keywords— *videogames, wellbeing, personality, presence, flow, immersion, obsessive and harmonious passion.*

I. INTRODUCTION

Over 92% of Australian homes have at least one device for playing videogames [1] and 68% of US households report playing videogames [2]. As videogames increase in popularity, questions regarding their impact on wellbeing become critical. There is increasing evidence of the benefits associated with videogame play, which include community building, stress reduction and improvements in mood and depression [3, 4]. At the same time there are concerns that videogames lead to negative outcomes such as addiction, social isolation or aggressive behaviour, which have led to the recent revision of the Australian Classification Board's system for rating videogames. Videogame technology has advanced in terms of graphical fidelity, immersive qualities, the ability to interact with full body motion, and the opportunity to play in almost any setting (e.g., on public transport, at school, work and home). As a result, the potential for videogames to influence wellbeing is expanding both in terms of the range of possible impacts and the number of people who may be influenced.

As detailed in this paper, there is convincing evidence that videogames can have either a positive or a negative influence on wellbeing, depending on the player, the type of game, and the play experience. However to date there has not been a comprehensive research project aimed at: (1) identifying the influence of all possible combinations of these factors; and (2) formalising this knowledge into a model that represents how factors interact, including how a factor can moderate and mediate the potential of other factors to help or harm the videogame player. In this paper, we present the People-Game-Play model as an initial framework for understanding how and when videogames have a positive or negative impact on player wellbeing.

II. WELLBEING AND VIDEOGAMES

We have chosen to limit our consideration of wellbeing to social and psychological wellbeing. Although physical health is obviously also an important component of wellbeing, its relationship with videogames is complex and changing as new controllers that involve larger body movements appear (e.g., Nintendo Wii, Microsoft Kinect). In light of the relative youth of such control interfaces, research exploring their impact on physical wellbeing is still emerging. In the future, as understanding of this relationship matures, the People-Game-Play model could be extended to incorporate physical wellbeing.

A. Psychological Wellbeing

Based on self-determination theory, [5,6] have established that videogames offer players satisfaction of their need for feelings of competence, autonomy and relatedness. Our own research has confirmed this with an Australian sample [7]. Moreover, satisfaction of these needs while playing videogames leads to long lasting improvements in positive affect/mood, post-play energy, life-satisfaction and self-realisation [5,6,8]. In a randomised controlled trial with a clinically depressed sample, the positive influences of videogames on mood have been shown to include reduction in tension, anger, depression and fatigue and increase in vigour [4]. In contrast, [9] have argued that videogames can lead to aggressive cognitions and feelings, and decreased empathy and prosocial behaviour.

B. Social Wellbeing

Using data collected from 30,000 players of massively multi-player online role-playing games, [10] found that some of the strongest motivations for play were related to social wellbeing, specifically: socialising (helping and chatting with others), the desire to form meaningful relationships with others, and deriving satisfaction from teamwork. In research conducted with high-school aged boys, [3] found that a high proportion of time spent playing was with friends and family. Moreover, they found evidence that videogame play was positively associated with family closeness and social involvement. Similarly, [11] found that play of first-person shooter videogames rarely happens in social isolation and that the strongest predictor of time spent playing was the desire for social interaction. In contrast, [12] found positive correlations between play of a particular online role-playing game and loneliness and poorer family communication.

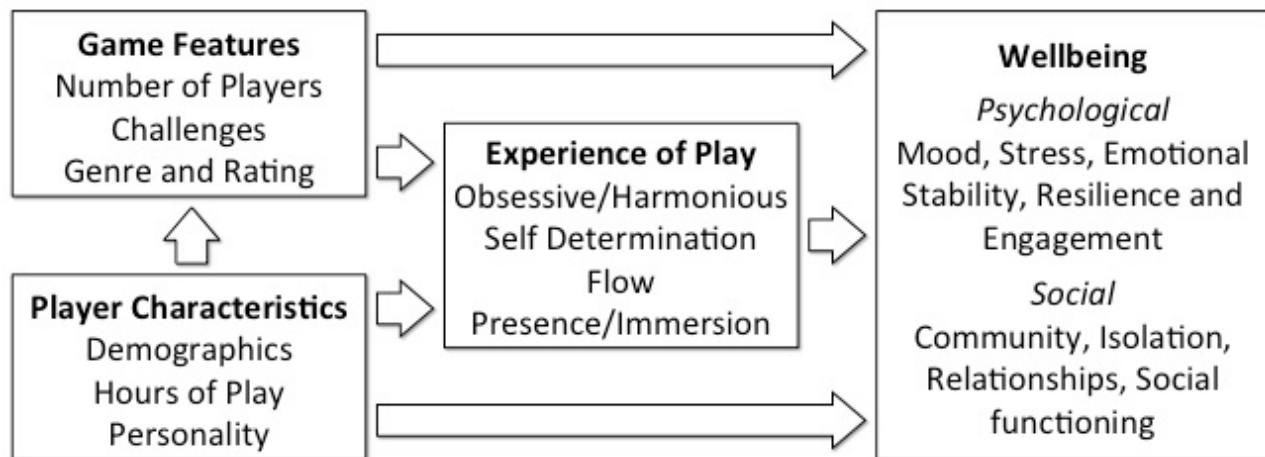


Fig. 1. The People-Game-Play Model of Videogames and Wellbeing

III. INFLUENCING FACTORS

Based on existing literature and our own research we propose three key determining factors for the influence of videogames on wellbeing; player characteristics, game features, and the experience of play. Incorporating these factors, we propose the People-Game-Play Model of Videogames and Wellbeing (See Figure 1).

A. Player Characteristics

There is clear evidence that personality interacts with game features to determine when videogames have a positive influence on wellbeing [7,13,14]. Our own research [14] has shown that people who enjoy casual, music and party games tend to be more extraverted and that people who enjoy role-playing games, MMORPGs, action role-playing games, turn-based strategy and real-time strategy games tend to be less extraverted. Additionally, people who like sport, racing, flight simulation, simulation and fighting games tend to be more conscientious. People who like action adventure and platform games tend to be more open to experience. Finally, people who enjoy first- and third-person shooters or who do not enjoy educational or puzzle games tend to be more emotionally stable (less neurotic). Similarly, we have shown that more emotionally stable people are less likely to experience presence and that those more open to experience are more likely to experience autonomy while playing [7].

In an exploration of personality traits and motivations for playing videogames, [15] found that openness to experience was positively related to motivations of discovery and role-playing, while conscientiousness was positively related to motivations of escapism. Additionally, extraversion and emotional stability were positively related to motivations to work in a team, and agreeableness was positively related to motivations for advancement. In a review of previous research on personality and videogames, [16] proposed a combination of personality factors that predisposed individuals to be vulnerable to a negative impact on wellbeing of videogame play. Specifically, they suggest that those low on emotional stability, agreeableness and conscientiousness may be more susceptible to the negative influence of videogames.

With respect to demographic factors, in a cross-sectional study conducted in Iran, [17] found that boys, but not girls, who reported playing videogames excessively showed more aggressive behaviours. With a sample of 16-year-old high school students from the US, [3] found that more females than males did not play videogames at all and more males than females reported the highest levels of use. A large scale study of players of Massively Multiplayer Online Role Playing Games (MMORPGs) found that males were more motivated by achievement (e.g., the desire to reach goals and accumulate in game items) and manipulation (e.g., deceiving, taunting or dominating other users), while females were more motivated by relationships (e.g., the desire to interact with others) [10].

B. Game Features

Our own research has shown that the preference for and experience of playing single or multiplayer games as well as the genre of the game are key factors related to the level of need satisfaction and wellbeing experienced by players [7,13]. In recently conducted research [18], we have found evidence of differing impacts on wellbeing and enjoyment of solo play, playing online with others and playing offline with others. In terms of genre, we have found that players tend to experienced greater autonomy and presence in strategy and role-playing games than in other genres [7]. Players of sport, racing and fighting games were found to experience less flow than players of other genres [13]. Similarly, immersion was found to vary between genres such that the experience of immersion was highest in action-adventure games, followed by strategy and role-playing games, then by shooters, with the lowest levels of immersion reported for sport, racing and fighting games.

Genre is an increasingly difficult means of describing videogames as they become more complex and “hybrid” genres (e.g., action-role-playing, strategy-first-person-shooter) become more common. In our own research we have found high levels of disagreement among participants regarding the genre of specific games. Examples include whether *Borderlands* is a first-person shooter, action-adventure, or role-playing game; whether *Grand Theft Auto*

IV is an action-adventure, role-playing, or third-person shooter game; whether *Portal 2* is puzzle, action-adventure or first-person shooter game; and whether *Resident Evil 5* is a third-person shooter or action role-playing game. These disagreements and complexities highlight the value of a more nuanced approach to classifying videogames. Regardless, there is consistent evidence that the experience of playing different types of games varies in ways likely to have an impact on wellbeing.

To this end, looking at game features rather than genre, [19] found evidence of the impact of the linearity of level design, strength of opponents, visual variety, damped sounds, degree of choice of weapons, availability of resources and presence of surprises on the play experience. Specifically, they found differences in the experience of positive affect, immersion, challenge, flow and tension as a function of the presence or absence of these features. These findings extended to both subjective (questionnaire) and objective (e.g., galvanic skin response and facial electromyography) measures.

C. Experience of Play

One of the key variables focussed upon by researchers in terms of the experience of play is the number of hours played. With respect to hours of play, [17] found a curvilinear relationship, such that those who did not play at all and those who played excessively, suffered poorer mental health than low to moderate level players. Similarly, [3] found that on a range of measures (family closeness, activity involvement, positive school engagement, positive mental health, substance use, self-concept, friendship network and disobedience to parents) players of videogames scored more favourably than their peers who never played videogames. Overall, the evidence seems to suggest that a non-excessive level of videogame play is associated with better outcomes than either no play or too much play.

However, other researchers have suggested that the amount of play is not the most important factor, rather it is the type of engagement that occurs while playing that matters. Drawing on the tenets of self-determination theory and the dualistic model of passion, [6] explored the differences between those playing videogames in an obsessive fashion (feeling like they *had* to play) and those playing videogames in a harmonious fashion (feeling like they *want* to play). They found that low levels of need satisfaction were associated with a more obsessive passion for videogame play, greater tension following play and low game enjoyment. In contrast they found that higher levels of need satisfaction were associated with more harmonious passion for play, greater game enjoyment and higher levels of energy after playing. Importantly, moderation analyses revealed that high amounts of play related negatively to wellbeing only in the context of obsessive passion for play. In short, the type of passion and not the amount of play was the more useful predictor of the impact of play on wellbeing. Similarly, [8] found that obsessive passion for play was related to negative affect and negative physical symptoms, while harmonious passion for play was positively associated with psychological wellbeing.

Other aspects of the play experience that have been shown to be relevant to the impact of videogame play on enjoyment and wellbeing, include presence, immersion and flow. Several researchers [13,19-20] have established links between videogame play and flow. Indeed, there is widespread agreement that videogames are particularly well suited to generating the experience of flow. While much of the research on flow in videogames is theoretical or correlational, [21] undertook experimental research that directly tested the nature of the link between videogames and flow. These researchers manipulated the match between the skills of players and the demands of a videogame and were able to show a direct impact on the experience of flow in terms of perception of time, involvement and enjoyment. Given the links between flow and wellbeing [22] it seems reasonable to assume that the experience of flow among videogame players has a direct impact on their psychological wellbeing. Similarly, research has established that the experience of self-determination related needs for competency, autonomy and relatedness as well as feelings of presence and immersion vary across game types [5,7,13] and have implications for enjoyment and wellbeing.

IV. PEOPLE-GAME-PLAY MODEL

The People-Game-Play Model aims to provide a holistic understanding of how videogame play can influence wellbeing. Based on the literature reviewed and our own research we present an initial attempt to identify how the different key factors relate in terms of their influence on player wellbeing. While there is evidence of the micro-level relationships between many of the individual components within these three factors and wellbeing (e.g., excessive time playing can have a negative influence on wellbeing, the experience of flow can positively influence wellbeing), there is a lack of a larger understanding of the relationships within and between each factor. There is a need for macro-level understanding of when and how videogames have a positive or negative impact. Specifically, understanding the **relationships between components within each factor**, for example, whether multiplayer role-playing games are more beneficial than multiplayer first-person shooters; understanding of **the nature and size of relationships between multiple factors**, for example, do multi-player games, attract more extroverted people, lead to higher levels of feelings of relatedness, and ultimately result in better wellbeing; knowledge regarding **where moderating relationships exist** (such that one factor affects the direction or strength of a relationship between other factors), for example, does personality determine how strong the relationship between first-person shooter games and hours of play is in terms of wellbeing; and **where mediating relationships exist** (such that certain factors account for the relationship between other factors), for example, further exploring the notion that it is whether people engage with games in a harmonious or obsessive fashion that determines whether they experience greater or lesser wellbeing, and not the amount they play nor the genre of game that they play. Research conducted within the context of the model will allow us to determine how the features of the game, the

characteristics of the player and experience of play interact to influence wellbeing.

V. CONCLUSIONS AND FUTURE WORK

We propose that future research makes use of a more macro or holistic view of videogame play. Rather than focussing on individual components within the model, we argue for considering the interplay of multiple key factors. An example of such research (that we plan to conduct in the near future) would be an experiment focussing on the characteristics of the player incorporating a combination of factors relating to personality, self-determination needs and type of engagement. From such an experiment we might find a result such as “where players engage obsessively with videogames a negative influence on wellbeing results regardless of personality or need satisfaction, but in the context of harmonious engagement the presence of need satisfaction for introverted players with greater emotional stability predicts a more positive impact on wellbeing”. While the aforementioned results are purely speculative they provide an example of the kind of insights we predict can be made by exploring multiple relevant factors in videogame-wellbeing research. Through presenting this theoretical model we aim to facilitate future research that will provide empirical support for the connections described in the model and offer an initial description of the relationships between these factors that will be modified and refined based on future research.

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