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Personality & Game Design Preference: Towards Understanding

Player Engagement and Behavior

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Abstract

A study was conducted in two parts to first validate a new questionnaire, the GDP-I, measuring game design preferences amongst gamers, and then secondly, to explore the relationship between game design preference and personality traits as per the HEXACO model of personality.

Principal components analysis of a sample of gamers ($N = 149$) found three dimensions of game design preference, labeled narrative design preference, social design preference, and reward design preference. In the second part of the study a sample of gamers ($N = 245$) were asked to take both the GDP-I and the HEXACO-PR-I (100-item). Correlational analysis indicated that preference for narrative design was significantly related to higher levels of emotionality, openness, and conscientiousness. Preference for social design was significantly related to higher levels of extraversion and lower levels of honesty-humility and openness. Preference for reward based design was significantly related to lower levels of honesty-humility and openness. These findings suggest a strong need for future research into the relationship between personality and video game design preference.

Keywords: video games, personality, game design, HEXACO model, motivation, individual differences, gaming

Personality & Game Design Preference:

Towards Understanding Player Engagement and Behavior

Research regarding video games and psychology has long been subject to a dominating paradigm of violence centric hypothesizing. A struggle in the field persists between the proving and disproving of violent video games as a causal link to violence in adolescents (Anderson, Shibuya, Ihori, Swing, Bushman, Sakamoto, Rothstein, & Saleem, 2010; Ferguson, 2007a; Ferguson 2007b; Ferguson & Kilburn, 2010). This focus in previous video game research fails to explore and capture the complexity and wealth of information that the field truly holds. As a result, video game research has been stifled, with the rich areas of research that exist outside of the violence paradigm gaining little notoriety or interest. One such area of study that shows tremendous promise is the study of personality and videogames.

Recent years in video games have been marked by an explosion of video game genres and playing platforms, but research into applications beyond the consumer markets, are emerging (Williams, Yee, & Caplan, 2008). One such area of video game focus is regarding health and therapeutic treatment applications. A review published by Franco (2016) explored the use of video games in therapeutic treatment, ultimately concluding that video games provided a viable option for patients to receive psychotherapy. Another review by Staiano and Flynn (2014) aimed to look at the efficacy of active video games in physical therapy and rehabilitation. Of the 64 studies reviewed the vast majority demonstrated significantly improved results over conventional physical therapy and rehabilitation methods (Staiano & Flynn, 2014). A second area of video game research is their application to enhanced learning. Engaging in video game play has been found to be excellent medium for learning and skill development. A study by Shute, Ventura, and Ke (2015) found significant improvements in measures of problem solving, spatial skill, and

persistence in undergraduates following 8 hours of playing the game Portal 2 when compared to the use of traditional brain training apps such as Lumosity. In another study, Oei and Patterson (2014) took inexperienced gamers and had them play 20 hours of action, puzzle, strategy and arcade games, measuring executive functions before and after play. Findings from the study found that the group who played puzzle games had significantly better measures of executive functions post play compared to baseline measures (Oei & Paterson, 2014).

With these novel fields of video game application, it stands to reason that not all players experience video games and engage in play in the same way, despite their potential benefits. The value of personality research in video games then becomes clearer, as a potential tool to understand how players' preferences may be shaped and ultimately how players choose to engage in game play.

Background

Personality & Video Games

Personality in video game research has been most commonly studied via the Big Five Factor and the HEXACO models of personality (Worth & Book, 2014; Bean & Groth-Marnat, 2016; Triberti, Villani, & Riva, 2015; Lee & Ashton, 2005). These traits are generally described in a normative capacity. At its core, the Big 5 (also known as "5 factor") personality trait model aims to describe personality lexically, across 5 major dimensions; openness, conscientiousness, extraversion, agreeableness, and neuroticism (Colman, 2008). These dimensions came into fruition through factor analysis that narrowed personality descriptors down to their broadest but still independent taxonomies (Colman, 2008). The Big 5 has been the pervading paradigm for personality research since the 1980's, with a multitude of researchers arriving at these 5 major dimensions through independent studies (Goldberg, 1990; Goldberg, 1992).

However, while reliable and consistent across vigorous empirical testing, the Big 5 has been routinely criticized for its lack of theoretical foundation; marking it more as a mathematical model than psychological, given its lack of lexical clarity that could lead to contradictory self-report between individuals (Block, 2010). The Big 5 has also been criticized for its inappropriateness in the study of adolescents (Block, 2010). Since most research regarding video games has been influenced by an agenda that stresses interest in behavioral effects on adolescents (Ferguson 2007a, 2007b), this could account for gaps in the literature that neglect the inclusion of personality measures.

In response to critiques of the Big 5, updated models have been created that utilize the Big 5 as a foundation. One such model that has gained prominence in personality research is the HEXACO model of personality (Ashton & Lee, 2005). The HEXACO model is inclusive of the same broad dimensions of the Big 5, openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism, with the addition of a 6th dimension honesty-humility and an adjustment to the dimension of neuroticism that changes the trait wording to emotionality with emotional stability treated as its opposite pole (Ashton & Lee, 2005).

Previous Video Game Research by Personality Factor

Due to the criticisms regarding the Big 5, and the increased flexibility provided by the HEXACO model given its continuum-based design, it seems more appropriate to utilize the HEXACO model of personality in future research considerations, however given factor overlap both Big 5 and HEXACO research should be considered for theoretical support.

Honesty-Humility. As defined by Lee & Ashton (2009) high scores on the honesty-humility scale, in the HEXACO model of personality, indicates an avoidance of manipulating others for personal gain, rule abidance, and modesty. In contrast low honesty-humility scores

suggest personality that will break rules for profit, material gain, and inflated sense of self. These traits associated with low honesty-humility scores also strongly map over all dark traits such as psychopathy, Machiavellianism, narcissism, and everyday sadism (Lee & Ashton, 2005).

Findings by Worth and Book (2014) demonstrated preferred PVP play style was significantly correlated with decreased honesty-humility scores. This finding however can be broken down into two categories of PVP player engagement; unfair and fair. Unfair PVP engagement could be explained by the fundamental game design and common behaviors inherent specifically within *World of Warcraft*. For example, ‘ganking’¹ and ‘corpse camping’² are common instances of PVP combat, centered around player dominance and exploitation of player weakness. These elements of game play share consistent definition with the concepts that underlie dark traits. This was supported in the study where participants that answered with preference for unfair PVP practices also scored significantly high on measures for interpersonal manipulation, callous affect, criminal tendencies, and the self-report psychopathy scale (SRP) (Worth & Book, 2014).

Conversely, fair PVP style play does exist within the game design, traditionally in the form of ‘battleground’ and ‘arena’ style PVP matches where there are agreed upon conditions and refereed combat. Interestingly, a one-directional relationship emerged wherein PVP players with a preference for unfair PVP style would also engage in fair play, but those with preference for fair play did not engage in unfair PVP style (Worth & Book, 2014). Overall, honesty-humility was able to strongly predict preference for PVP style play, accounting for 14.1% of variance.

¹ **Ganking:** The use of underhand means to defeat or kill a (usually less experienced) opponent.

² **Corpse Camping:** Refers to the process of a player camping (waiting) specifically next to the enemy's corpse (or, less often, by the closest graveyard) with the purpose of continuously killing that enemy as soon as their resurrection takes place.

Emotionality (Neuroticism). Emotionality is a personality trait that aims to measure an individual's proclivity towards anxiety as well as their needs for emotional support from an attachment with others (Lee & Ashton, 2009). Theoretically, high scores on this domain would indicate personality sub-traits such as fearfulness, anxiety, dependence, and sentimentality with lower scores suggesting emotional detachment from others, and little determent by threats of physical harm and stressful events (Lee & Ashton, 2009).

As it relates to game play, a study by Bean and Groth-Marnat (2016) found that high neuroticism scores in *World of Warcraft* players had a significant positive correlation with a preference to engage in role playing³ style play over player versus player⁴ and player versus Environment⁵ style play. This finding however was somewhat contradicted by a study conducted by Worth and Book (2014) who aimed to study game play preference in conjunction with HEXACO traits to answer the research question, "what are the relationships between HEXACO personality traits and in game behavior components". Their research similarly included measures of role playing, player versus player, and player versus environment style game play, but added dimensions of behavior such as working, helping, core content completion, and immersion. Findings showed significant correlation between emotionality and working, helping, and core content completion behaviors, over all other measures studied rather than role playing style play (Worth & Book, 2014).

Bean and Groth-Marnat (2016) offer little insight into why players with high neuroticism scores would prefer engagement in role playing style game play, however it is possible that such

³ **Role Playing:** Participation in a role-playing game in which players take on the roles of imaginary characters who engage in adventures, typically in (but not limited to) a particular fantasy setting .

⁴ **Player versus Player:** A type of multiplayer interactive conflict within a game between two or more live participants.

⁵ **Player versus Environment:** A type of interactive conflict within a game where players compete against computer-controlled opponents and/or players.

game play offers the lowest levels of social threat, and therefore an ability to lessen the anxious tendencies of the personality type. This justification, is used by Worth and Book (2014) who argue that working and core content behaviors, similarly, are low social threat game play elements, given that they offer little risk of failure and criticism from others. Helping behaviors in game play can be explained by the increased detail of the HEXACO model, wherein emotionality also describes the propensity towards sentimentality and dependence (Worth & Book, 2014; Lee & Ashton, 2009). While the work by Bean and Groth-Marnat is internally valid, its lack of inclusivity of core game design elements ultimately causes it to miss true effects, that Worth and Book (2014) can begin to capture with their expanded model.

In a departure from focus on *World of Warcraft*, A 2015 study also using the HEXACO model of personality, utilized survey method to assess personality measures across preference for play style. Emotional stability was found to positively correlate with a preference for exploratory⁶ game play (Zeigler-Hill & Monica, 2015). In another study Braun, Stopfer, Müller, Beutel, and Egloff, (2016), opted for the use of the Big 5, to study personality, level of game play (non-gamers, regular gamers, and addicted gamers), and genres of play. Their findings also suggested a significant preference for action⁷ style games among those that measured low in neuroticism.

Given that exploratory and action style game play are both high risk styles of play, that could result in failure and criticism, their correlations with low levels of emotionality and neuroticism lend credence to the findings and justifications of Worth & Book (2014). More

⁶ **Exploratory Game Play:** Game design where previously-played areas of the game can be revisited, and gameplay often involves finding unreachable paths, and returning to them later in the game with items or abilities that will make them accessible. Usually, by the end of an exploratory game, the player has access to every part of the game world.

⁷ **Action Games:** A video game genre that emphasizes physical challenges, including hand–eye coordination and reaction-time. The genre includes diverse subgenres such as fighting games, shooter games and platform games

importantly the combinations of these findings suggest a bi-directional relationship between emotionality/neuroticism measures and game play preference behavior.

Extraversion. High scores of extraversion can be characterized by individuals who are outgoing, socially at ease, self-confident, and have an optimistic demeanor (Lee & Ashton, 2009). At its opposing pole introversion is usually indicative of social withdrawal, perceived awkwardness, shyness, and a reserved disposition (Lee & Ashton, 2009).

In the study conducted by Bean and Groth-Marnat (2016) findings suggested preferences for player versus player style game play, with significant positive correlation to extraversion, over players who preferred role playing style game play. This finding was contradicted however, by Worth and Book (2014) who while including the same measures as Bean and Groth-Marnat, found that player versus environment style game play preference was most strongly correlated with extraversion over any other measure. Additional, but less significant positive correlates were found for helping and core content⁸ completion style play (Worth & Book, 2014).

With an understanding of game design an intuitive link comes to mind regarding the high correlations between player versus environment and helping style game play. Specific to *World of Warcraft*, player versus environment style game play is highly social, wherein real-world players team together to raid⁹. The players must work together and be willing to speak up to achieve success. Extraverts who are characterized by high levels of sociability, would be the most likely to seek out social interactions and given that these game play settings rely on social ability, as cooperative game play and helping others requires the social confidence to interact with and sometimes direct others (Lee & Ashton, 2009) it would be probable that extraverts

⁸ **Core Content:** Describes the main story line or main playable content in a given video game. For example, in narrative focused games certain objectives will progress the main story line while others (often called side quests/objectives) will not and may have no impact on the main storyline.

⁹ **Raiding:** A raid is a type of mission in a video game in which a number of people attempt to defeat another number of people at a player-vs-player or a number of non-player characters in a player-vs-environment battlefield.

would then be most interested in engaging in this type of play over player versus player modes. Player versus play content in World of Warcraft is competitively, rather than cooperatively, focused, creating less of a demand for the high social skills associated with extraversion.

Further studies that were inclusive of multiple game genres, collected via open response and survey methods, also found strong positive correlations between extraversion and preference for action, survivor¹⁰, and challenge-based game play (Braun et al., 2016). These findings could be attributed to the more risk-taking nature associated with extraversion, as those high in this trait measure tend to seek high levels of stimulation (Lee & Ashton, 2009). These game play types, action, survivor, and challenge are all considered high intensity and therefore high stimulation. However, these studies fail to have consistent lexical definitions for the game genres between them and more importantly in the communication to participants. It could be argued that survivor style games would be subsumed under the category of action games. Furthermore, both types of games could be demarcated by the characteristic of challenge, which could on its own be considered more of a game element present across any genres of game. For this reason, decisive conclusions regarding these studies are difficult to ascertain. Future studies could ameliorate this issue, with deeper consideration for classifications of game genre and game design.

Agreeableness. The trait of Agreeableness is chiefly concerned with forgiveness, leniency in judgement, patience, gentleness, compromise and cooperation in both the Big 5 and HEXACO models of personality (Lee & Ashton, 2009). However, in contrast the HEXACO model of personality aims to counterbalance agreeableness with an opposing pole of responsive

¹⁰ **Survivor Games:** A subgenre of action video games that generally start the player off with minimal resources, in a hostile, open-world environment, and require them to collect resources, craft tools, weapons, and shelter, and survive as long as possible.

anger and stubbornness, whereas the Big 5 model looks at disagreeableness regarding self-interest before concern for others (Lee & Ashton, 2009).

Perhaps non-surprisingly, high scores of trait agreeableness were significantly negatively correlated with preference for playing evil morally-aligned characters in (Triberti, Villani, & Riva, 2015). This is to say that those that are highly agreeable seek to play characters with positive moral values, perhaps due to their nature towards social cohesion and cooperation. Worth and Book (2014) found that high scores of agreeableness positively correlated with a preference towards player versus environment and helping style play. Most interestingly, these findings were all uniformly found to run in tandem with scores of extraversion (Triberti et al., 2015; & Worth & Book, 2014). This suggests the possibility that these preferences are not driven by extraversion or agreeableness alone but rather combinatively, suggesting unique and complex interactions between game elements and personality.

Conscientiousness. Highly organized in both environmental and scheduling contexts, those with high trait conscientiousness can be described as disciplined perfectionists that think carefully before acting (Lee & Ashton, 2009). Those low on trait conscientiousness exhibit a tendency towards impulsivity, disarray, and low motivation to exert energy towards achievement (Lee & Ashton, 2009). Given the propensity for organization and high achievement, it comes as little surprise that research has found high trait conscientiousness to correlate with a preference for simulation¹¹, working, and challenge style behaviors in game play (Worth & Book, 2014; Braun et al., 2016; Zeigler-Hill & Monica, 2015). Further study by Bean and Groth-Marnat (2016) found that preferences for player versus environment style game play behavior was significantly correlated with conscientiousness over players who preferred role playing and

¹¹ **Simulation Games (Sims):** Describes a diverse super-category of video games, generally designed to closely simulate real world activities.

player versus player style game play. Further study helps lend credence to previous positive correlated findings with conscientiousness negatively correlated with survivor game play preference (Zeigler-Hill & Monica, 2015). Given the chaotic and disorganized style of play that survivor games embody, this finding serves to reinforce the continuum on which the HEXACO model is based, in tandem with game play designs.

Openness. High scores in openness to experience are characterized by interest in art, nature, a wide array of domains of knowledge (Lee & Ashton, 2009). Typically, those high in openness to experience can be described as imaginative, creative, and adaptable (Lee & Ashton, 2009). On the opposing pole to openness to experience, those with low trait measures tend to be unconcerned with art and express little creative and intellectual interest, making them not attracted to ideas and environments that are unconventional (Lee & Ashton, 2009).

More than any other personality trait measure, openness most consistently correlated with enjoyment of play and showed the largest range of positive correlates for game behavior preferences. Role playing style play was consistently found to be a preferred style of play behavior in three of the studies examined (Bean & Groth-Marnat, 2016; Worth & Book, 2014; Braun et al., 2016). This could best be explained by game design elements in role playing style games that aim to immerse players into fantasy worlds, with differing social mores, logistics, and experiences. Those open to experience tend to not be deterred by the unconventional and have a heightened appreciation for the imaginative, these are some of the number one goals for the designer of a role playing style game. This comfort with unconventionality could also explain for an additional finding by Zeigler-Hill and Monica (2015) who measured a significant preference for survivor and challenge style play. Survivor style, a genre steeped in chaotic structure and broken norms in comparison to real world structure, would likely not deter those

high with openness to experience. Similarly, challenging games would pose less of a threat to those with high trait openness, as they would be less concerned about risks of failure and more interested in a novel experience of play.

Issues in Previous Personality & Video Game Research

Current research pertaining to video games and personality is in its infancy and often generates a somewhat contradictory picture of the relationship between the two. This inability to make substantiated claims across research could be explained by many factors such as lack of consensus in game terminology combined with the issues of self-report and methodology that ignores the effect of design elements present in video games.

Game Terminology. One such example indicative of the issues with game terminology can be seen with trait agreeableness, which was found to have no effect on genre preference by Braun et al., (2016), but was found to significantly positively correlate with preferred player versus environment and “helping” style gaming by Worth & Book (2014), as well as significant positive correlation with a preference to play challenging games found by Zeigler & Monica (2015). In this example, a lack of consensus in terminology, combined with the issue of self-report, creates issue both within the individual studies and between them undermining overall construct validity.

Consider player versus environment style game play in *World of Warcraft*, the lack of strong definition of terms leads to confusion that could ultimately confound results. This type of game play could be characterized as both “helping”, as well as “challenging” style game play. This decision is left totally to the perspectives of the individual gamer in the previously mentioned studies (Blizzard Entertainment, 2004). The lack of agreed upon consensus of terminology combined with participants self-report undermines the construct validity of the

research. Consensus and standardization is vital to increase the internal validity of future studies that aim to measure personality traits across multiple game genres.

Game Play Contexts. Poor methodology including a lack of consideration for contextual elements in game design further hinders the ability for research to make powerful claims. One such study found that when compared to the general population on Big 5 measures, average players of *World of Warcraft* fall within the same ranges of normative scores. The reason why *World of Warcraft's* population of players is similar to the general population is the complexity of the game design itself, which through a variety of game design contexts, creates an environment that offers different gameplay to a diverse range of people (Blizzard Entertainment, 2004). In this case the consideration of different types of game design could have resulted in a less generalized data result and may have explained and highlighted key variances and interactions. This is also demonstrative of a second major issue inherent within video game and personality research—the tendency to focus solely on one game per study (another form of ignoring game design differences and contexts). Resultantly, findings are only attributable to the respective games studied, as context and similarity to larger game designs are rarely explored. Future research that considers game design will have more power to explain for video game in that larger picture rather than being limited to individual game findings.

Considering Core Game Design

Studies into video games and their effects on behavior also remain widely inconclusive, providing concrete evidence only in the form of relational measures with little ability to make directional claims. This could be largely attributed to the fact that most studies focus solely on one game at a time and pay little regard to game style and context of play. Several of the above studies aimed to measure components of game design, but with each study different sub-

elements of design were measured, without consideration for overarching design themes that are part of the core concepts used in game design (Bean & Groth-Marnat, 2016; Worth & Book, 2014; Braun et al., 2016). Given the growing creativity in game design and development, an important starting point must be defined—different core types of game design. Under this consideration, review of the most often found themes and tested motives in video game research, as well as a review of basic game design elements, reveal three major contextual drives in game design; narrative, social and reward-based designs (Sherry, Lucas, Greenberg, & Lachlan, 2006; Adams, 2010).

Narrative Design. The first proposed context that may influence the behavior of an individual is story driven game design. A study by Schneider (2004) investigated how game playing experience changes when a story is added to a first-person shooter game. Dependent variables of the study included identification, presence, emotional experiences and motivations. Findings suggested that when story was present, game players felt greater identification, sense of presence, and physiological arousal (Schneider, 2004). Researcher Schneider explains, “game designers put a lot of effort into making video games more immersive. The underlying assumption is that the feeling of being immersed leads to greater enjoyment and thus more positive attitudes toward the game.” (Schneider, 2004).

Social Design. A second major context that may influence player behavior is game design that is inclusive of social components. Types of social interaction can vary from in game chat, cooperative play (for example player versus environment), economic markets where players buy and sell in-game items, and more. Games that have a heavy social component most

generally are those that promote interaction with real players versus non-player characters.¹²

The importance of this game design is supported by Sherry et al. (2006) who found that the number one most cited motivation to engage in game play, especially for middle school aged males was social interaction. Further support for this context lies in a multitude of other studies that found preferential correlates with social style game play (Bean & Groth-Marnat, 2016; Worth & Book, 2015; Braun et al., 2015; Zeigler-Hill & Monica, 2015).

Reward Design. A third major context that may influence player behavior is design inclusive of in game rewards. In game rewards are things such as currency, items, or information that help achieve success in the game. This design context is brought to prominent light by findings that challenge and competition were highly rated motivations to play, across multiple studies (Sherry et al., 2006; Worth & Book, 2014; Braun et al., 2015; Zeigler-Hill & Monica, 2015). These motivations, challenge and competition, are typically satiated through rewards given in response to successfully navigating game dynamics and winning against other players or achieving top ranks. As a player progresses, the rewards increase, which create a snowball effect of continued ability to beat harder challenges and earn better rewards (Adams, 2010).

Current Study: Aims & Hypotheses

Aims

The following proposed study has 2 major aims;

1. To develop a questionnaire that measures core video game design preferences.
2. To explore the relationship between personality and player preference for video game design contexts.

¹² **Non-player characters:** Sometimes known as a non-person character or non-playable character, in a game is any character that is not controlled by a player. In video games, this usually means a character controlled by the computer through artificial intelligence.

Hypotheses

Narrative Design & Personality. In narrative design contexts, game play is centered on immersive story lines that connect the player to the characters and events in the game. It is hypothesized that narrative design context would be preferred by players with high scores of emotionality and openness, given their links with sub-facets of sentimentality and inquisitiveness, respectively (Lee & Ashton, 2009). Regarding emotionality, the sub-facet of sentimentality denotes the tendency for those with high scores on this trait to feel strong emotional attachments to others; this preference could therefore increase player enjoyment in these game settings resulting in a preference for the game design.

High trait scores of openness have been demonstrated in research to positively correlate with preference for role playing games (Bean & Groth-Marnat, 2016; Worth & Book, 2014; Braun et al., 2016; Adams, 2010). This genre of game play heavily relies on story narratives and therefore suggests a preference of narrative driven game design for individuals with high trait openness scores.

HP 1: *Preference for Narrative Driven game design will be positively correlated with emotionality and openness.*

Social Design & Personality. In social design contexts, games utilize elements with other players such as team cooperation, in game resource trade, open chat, and more. High measures of agreeableness and extraversion would be most likely correlate with social based game design given the highly dynamic settings that social interaction creates. Successful game play in social design requires players to be flexible, patient, forgiving, and cooperative (agreeableness facets), as well as, socially at ease, outgoing, and confident (extraversion facets), so that they can optimally enjoy the game (Lee & Ashton, 2009). Supporting research suggests

that those with high measures of agreeableness and extraversion both have play preference for player versus environment (social based) style game play (Bean & Groth-Marnat, 2016).

Additionally, the influence of social factors would most likely impact those with these high trait levels as they would be more aware and considerate of others further enhancing game play.

HP 2: *Preference for Social Driven game goals will be positively correlated with agreeableness and extraversion.*

Reward Design & Personality. In reward design contexts, games are designed around the completion of goals to receive in-game rewards such as trophies, gear, avatar enhancements, and more. It could be hypothesized that increased conscientiousness, as well as, decreased honesty-humility and emotionality would indicate preference for reward design in video games. Those with high scores of conscientiousness tend to seek order, act non-impulsively, and be diligent. These characteristics are central to reward based design and are supported by previous research indicating game preference by those with high conscientiousness for simulation, working, and challenge style games, all of which can be characterized by reward-based design (Worth & Book, 2014; Braun et al., 2016; Zeigler-Hill & Monica, 2015; Adams, 2010).

Conversely, low scores for honesty-humility and emotionality would most likely demonstrate a relation to preference for reward design. This could be explained by the opposite anchoring of honesty-humility, which is characterized by self-interest and material gain, promoting players with low scores on this measure to be drawn to the personal gain inherent in reward design (Lee & Ashton, 2009). Emotionality is characterized by an inclination towards bond formation and increased empathy, and therefore would likely grant narrative and even social based design more preferential power, for this reason it would most likely be decreased emotionality that would also lead to reward design preferences (Lee & Ashton, 2009).

HP 3: *Preference for Reward Driven game goals will be positively correlated with conscientiousness and negatively correlated with honesty-humility and emotionality.*

Method

Participants – Stage 1

The first stage of the study was conducted with 150 participants. One participant was eliminated given a self-reported age below 18 years, therefore not meeting recruitment criterion. Of the remaining participants ($N = 149$) 10.7% reported as “female” ($n = 16$), 88.6% reported as “male” ($n = 132$), and 0.7% reported as “other/prefer not to say” ($n = 1$).

Participants ages were reported as follows; 47% aged “18-25” ($n = 70$), 47% aged “26-35” ($n = 70$), 4% aged “36-45” ($n = 6$), 1.3% aged “46-65” ($n = 2$), and 0.7% aged “65 and above” ($n = 1$).

Participants reported residency in a total of 27 countries with most coming from the United States at 54.5% ($n = 81$). The United Kingdom was the second most reported country with 10.1% ($n = 15$), followed by Canada at 6% ($n = 9$), Sweden at 4% ($n = 6$), The Netherlands at 4% ($n = 6$), and Germany at 3.4% ($n = 5$). All remaining reported countries were within Europe and Asia and comprised less than 2% per country.

The majority of gamers met the criterion for regular gaming with 37.6% ($n = 56$) of participants reporting they played “more than 15 hours” of games per week. 28.2% ($n = 42$) of gamers reported playing between “6-10 hours” of games per week, 24.8% ($n = 37$) reported playing between “11-15 hours” of games per week, and 9.4% ($n = 14$) of gamers reported playing between “1-5 hours” of games per week.

Participants – Stage 2

The second stage of the study was conducted with 301 participants. Six participants were eliminated given a self-reported age below 18 years, therefore not meeting recruitment criterion. Of the remaining participants ($N = 245$) 9.9% reported as “female” ($n = 17$), 90.6% reported as “male” ($n = 222$), and 2.4% reported as “other/prefer not to say” ($n = 6$).

Participants ages were reported as follows; 26.9% aged “18-25” ($n = 66$), 60% aged “26-35” ($n = 147$), 10.6% aged “36-45” ($n = 26$), 2% aged “46-65” ($n = 5$), and 0.4% aged “65 and above” ($n = 1$).

Participants reported residency in a total of 32 countries with most coming from the United States at 60.8% ($n = 149$). Canada was the second most reported country with 10.2% ($n = 25$), followed by The United Kingdom at 8.6% ($n = 21$) and Germany at 2.4% ($n = 6$). All remaining reported countries comprised less than 2% per country.

The majority of gamers met the criterion for regular gaming with 38.4% ($n = 94$) of participants reporting they played “more than 15 hours” of games per week. 32.7% ($n = 80$) of gamers reported playing between “6-10 hours” of games per week, 20.4% ($n = 50$) reported playing between “11-15 hours” of games per week, and 8.6% ($n = 21$) of gamers reported playing between “1-5 hours” of games per week.

Measures

Measuring Game Design Preference: GDP-I. Game Design Preferences Inventory (GDP-I) was developed and piloted as stage 1 of the current study. The inventory was developed as 24 items, with 8 items intended to measure 3 specific game design preference dimensions: narrative, social, and reward (see Appendix A for full list of items). Participants were instructed to rate how much they agreed with each of the 24 items on a 1-7 Likert scale with 1 being “strongly disagree” and 7 being “strongly agree”. They were also asked to consider the defined 3

types of game design (see Appendix B for full list of definitions) when rating the items with examples of games that correspond to the given design type. Game examples were derived through the surveying of 25 regular gamers previous to this study¹³, who were asked to list 3 games for each definition that they thought best exemplified it. Then by measure of frequency games were selected as examples for each design type.

Measuring Personality: HEXACO-PI-R (100-item). Designed by Lee & Ashton (2009) and available for free non-commercial use with scoring guide. This is the revised version of the original HEXACO personality inventory and has been utilized across a huge number of studies with high validity. The inventory is available in a longer format (200-items) and a shorter format (60-items). Research and the developers themselves recommend the 100-item for best results over the 60-item. While the 200-item has the best consistency of the three it is much more time demanding for both the researcher and the participant and therefore is not a good fit for use for a master thesis project. Most recently the HEXACO-PI-R (100-item) was examined for inter-collinearity (Lee & Ashton, 2016) with findings showing very low inter-correlations, this supporting questionnaire reliability. Only one pair of sub-scales of HEXACO had an absolute correlation above .020, honesty-humility and agreeableness (Lee & Ashton, 2016).

Procedure

Participants were recruited by convenience sampling via digital recruitment. Social media was chiefly utilized via advertisement on Facebook, Reddit: r/Gamers, and 3 Major Twitch Channels. Upon visiting the questionnaire link participants first came upon a page that included the participation criterion, as well as information about the study, their anonymity, right to withdraw at any time, and ability to participate in a prize drawing for participation. They were then asked if they consented to participate. Participants were required to be at least 18 years of

¹³ Regular Gamers are those who play 15 hours or more video gamers per week as defined by Gentile (2009).

age and engage in a minimum of 1 hour of video game play per week. Incentive was offered as the chance to win 1 of 5 random Steam game keys with an estimated value of \$20. Following the completion of the questionnaire they were directed to a final page where they were thanked for their participation, assured of their anonymity, asked if they would like to provide an email to participate in the prize drawing, and provided with contact information for questions or concerns regarding the study.

Statistical Analysis

Preliminary analysis was performed to ensure no violations of normality, linearity, and homoscedasticity. Relationships were deemed significant at the $p < .05$ level. According to Cohen correlations with values between $r = 0.10$ to 0.29 are considered weakly related, values between $r = .30$ to $.49$ are moderately related, and values between $r = .50$ to 1.0 are strongly related (Cohen, 1988).

Results – Stage 1

Principal components analysis was conducted on the GDP-I extracting all components with eigenvalues in excess of 1 as per Kaiser criterion (Kaiser, 1960). Component transformation matrix values suggested a Varimax rotation be conducted. This resulted in 5 total components to be extracted with $\alpha \geq 0.3$ retained per each component. Analysis of the scree plot showed that there was an altered direction of the scree plot after 3 components. The first three components explained 53.78% of total variance. These findings determined that first 3 components should be retained (see Appendix C).

These three components were then put through reliability analysis to check which items should be retained. Reliability analysis revealed sufficient Cronbach's Alpha scores (in excess of 0.8) for components 1 and 2, suggesting all items could be retained, but removal of items S7

& N4 lead to optimized Cronbach's Alpha scores and were therefore removed (see Appendix D & E). Reliability analysis of Component 3 suggested the deletion of item R4 to improve Cronbach's Alpha and meet a measure 0.8 (See Appendix F).

Results – Stage 2

For the second stage of the study a factor analysis was first conducted to check for similar loadings as with the first sample group in stage one. Loadings were similar however, there was increased cross loading of two dimensions of the GDP-I, social and reward design preference. Following this, relationships were investigated between all 6 of the HEXACO model dimensions and all 3 GDP-I dimensions using Pearson product-moment correlation coefficients (table 1). Data was then also split by gender to look at findings comparatively across the groups (table 2). The “prefer not to answer” gender category was omitted, as there were only six participants, too few to validate meaningful results.

Table 1

Pearson Correlations between HEXACO Personality Scales and Game Design Preferences

	<i>M</i>	<i>SD</i>	Narrative	Social	Reward
Honesty-Humility	55.02	8.04	.079	-.259**	-.127*
Emotionality	48.35	9.06	.132*	-.002	.038
Extraversion	45.75	10.23	.060	.211**	.028
Agreeableness	45.97	7.90	.031	.116	.095
Conscientiousness	53.56	8.84	.154*	-.050	-.119
Openness	55.10	8.75	.744	-.160*	-.205**
Narrative Design	38.20	7.38	1	-.247**	-.249**
Social Design	23.43	9.13	-.247**	1	.264**
Reward Design	25.67	8.26	-.249**	.264**	1

Note. $N = 245$; * $p < .05$; ** $p < .01$

Table 2

Pearson Correlations between HEXACO Personality Scales and Game Design Preferences by Gender

	<u>M</u>	<u>SD</u>	<u>Narrative</u>	<u>Social</u>	<u>Reward</u>
Male (<i>n</i> = 222)					
Honesty-Humility	55.14	8.11	.065	-.237**	-.124
Emotionality	47.95	8.93	.103	.020	.044
Extraversion	45.55	10.03	.068	.180**	.013
Agreeableness	45.81	7.72	-.016	.148*	.117
Conscientiousness	53.50	8.81	.178**	-.100	-.134*
Openness	54.75	8.81	.134*	-.166*	-.204*
Narrative Design	38.15	7.30	1	-.236**	-.246**
Social Design	23.53	9.05	-.236**	1	.257**
Reward Design	25.56	8.37	-.246**	.257**	1
Female (<i>n</i> = 17)					
Honesty-Humility	53.53	7.02	.240	-.555*	-.044
Emotionality	53.18	9.74	.279	-.289	-.273
Extraversion	45.12	13.38	-.035	.568*	.191
Agreeableness	48.47	10.57	.458	-.136	-.244
Conscientiousness	54.94	8.93	-.172	.470	-.011
Openness	57.77	7.54	.169	-.171	-.141
Narrative Design	36.65	9.57	1	-.344	-.416
Social Design	23.47	11.20	-.344	1	.503*
Reward Design	28.71	6.73	-.416	.503*	1

Note. * $p < .05$; ** $p < .01$

Hypothesis 1: Narrative Design Preference. Findings supported hypothesis 1.

Narrative design preference had a weak positive relation with dimensions of emotionality ($N = 245$, $r = .132$, $p = .039$) and openness ($N = 245$, $r = .132$, $p = .038$). This indicates that the more people preferred narrative game design, they also scored higher on emotionality and openness.

An unexpected finding was the positive relation between narrative design preference and conscientiousness ($N = 245$, $r = .154$, $p = .016$). This finding indicates that individuals with preference for narrative design had higher levels of conscientiousness.

When split by gender, men's preference for narrative design was not related to emotionality. However, correlations to openness ($n = 222$, $r = .134$, $p = .046$) and conscientiousness ($n = 222$, $r = .178$, $p = .008$) remained significant. This indicates that men who prefer narrative game design are more open and more conscientious. For women ($n = 17$) narrative design had no relations to HEXACO-personality traits.

Hypothesis 2: Social Design Preference. Findings partially supported hypothesis 2 with social design preference having a positive correlation with the dimension of extraversion ($N = 245$, $r = .211$, $p = .001$). This finding indicates that individuals who preferred social design had higher levels of extraversion. The relationship between social design and agreeableness did not reach significance.

An unexpected finding was a negative correlational relationship between social design preference with both openness ($N = 245$, $r = -.160$, $p = .012$) and honesty-humility ($N = 245$, $r = -.259$, $p = .001$). This finding indicates higher preference for social game design is contra-intuitively linked to lower scores of honesty-humility and openness.

When split by gender, men with preference for social design were found to have a positive relationship with both agreeableness ($n = 222$, $r = .148$, $p = .028$) and extraversion ($n = 222$, $r = .180$, $p = .007$). This finding indicates that men with higher preference for social design were more agreeable and extraverted. Additional findings in the male sample were the negative correlations between social design preference and honesty-humility ($n = 222$, $r = -.237$, $p =$

.001), as well as, openness ($n = 222, r = -.166, p = .013$). These results indicate that as preference for social design increases measures of honesty-humility and openness decrease.

Results for women with preference for social game design showed a strong positive relation to extraversion ($n = 17, r = .586, p = .017$), as well as, a strong unexpected negative association to honesty-humility ($n = 17, r = -.555, p = .021$). These findings indicate that as preference for social design increases so does measures of extraversion increases. In the female sample scores for honesty-humility decrease as preference for social design increases, but no other dimensions reach significance.

Hypothesis 3: Reward Design Preference. Findings partially supported hypothesis 3. Individuals with reward design preference demonstrated a negative relation to honesty-humility ($N = 245, r = -.127, p = .047$). This result indicates that people, who prefer reward design, will have lower levels of honesty-humility. In relation to reward design, a negative relation was hypothesized to scores for emotionality, but no association was found.

An unexpected finding was that reward design preference was found to have a negative link to openness ($N = 245, r = -.205, p = .001$). This finding indicates that people preferring reward design had lower levels of openness.

When split by gender, the hypothesized reward design and scores for honesty-humility did not reach significance for men. Men with reward design preference did also demonstrate an unexpected negative association to conscientiousness ($n = 222, r = -.134, p = .046$), which was opposite to the assumed direction. This finding indicates that men with higher preference for reward design have lower scores for conscientiousness.

An unexpected finding was that men with reward design preference demonstrated a negative relation to the dimension of openness ($n = 222, r = -.204, p = .002$) Women showed no significant findings across any of the HEXACO dimensions.

Additional Findings: Design Preferences. Social design preference and reward design preference ($N = 245, r = .264, p = .001$) were found to have a positive association. This finding indicates that participants in the sample who reported a high preference for social design also reported high preference for reward design. Conversely, preference for narrative design was negatively associated to a preference for reward ($N = 245, r = -.249, p = .001$) and social design ($N = 245, r = -.247, p = .001$), meaning that those who preferred narrative design did not prefer social and reward design with weak relationships presenting between reward and social with narrative design preferences.

Discussion

The current study aimed to first test a new questionnaire intended to measure player preference for game design types, narrative, social, and reward. Following this the study then aimed to explore and examine the relationships between the HEXACO model of personality and game design types. PCA confirmed that the GDP-I loaded into 3 main major factors, which can be related to earlier attempts in the literature to study game design.

Hypothesis 1: Narrative Design Preference

Findings for the first hypothesis, narrative design preference, suggest that those who prefer games with narrative based designs score higher on emotionality, openness, and conscientiousness. As theorized the relation to emotionality and openness is likely due to the nature of narrative designs, which encourage connection to developed and complex characters and storylines, as well as, the exploration of novel scenarios and environments. These

mechanics of the design therefore state the personality's sub-dimensions of sentimentality and inquisitiveness. An unexpected finding, a positive association with conscientiousness, could be explained by the personality's sub-facet of prudence, which is characterized by high scorers' tendency to suppress impulses and deliberate carefully before making decisions (Lee & Ashton, 2009). Often, in this game design type the focus of play is centered on linear, set content thus the appeal to those who like to avoid impulse decision making. Additionally, in narrative focused designs, players have the option to pause before committing to specific in game actions, allowing them the time to deliberate about what they will do next or how they wish to play. This is in contrast to many social and reward driven games that tend to impress quick decision making given their dynamic designs. For this claim to be substantiated, further research is required, as the current exploratory analysis did not analyze results per HEXACO sub-facets.

Hypothesis 2: Social Design Preference

Findings for the second hypothesis, social design preference, suggest that those who prefer games with social based designs do tend to be quite extraverted. As theorized the relation to higher scores for extraversion is likely due to the social demands generated in the game design. Those with high extraversion are likely to feel more at ease playing with and interacting with others, therefore allowing them to enjoy the game design more than those with low measures of extraversion who may feel alienated by these social demands. Unexpected findings were that, those that prefer social designs had lower scores for honesty-humility and openness. Furthermore, those with a social design preference also enjoyed playing reward based game design. One explanation could be that social design is inherently polarized between those who may prefer competitive play and those who prefer cooperative play. Future research warrants a

developed version of the GDP-I that aims to differentiate different types of social game design, competitive and cooperative play both as dimensions and in demographical measure.

Hypothesis 3: Reward Design Preference

Findings for the second hypothesis, reward design preference, suggest that those who prefer games with reward based designs do tend to be less honest and humble than their peers who prefer other game design types. Additionally, gamers who prefer reward based design tend to be less open to experience. As theorized the relation to low honesty-humility scores are likely a product of the game design itself, wherein motivation to engage in play is dependent on a desire for material gain. Lower openness scores could also be accounted for by the design systems based around rewards, which are often predictable cycles of play with clear rules and guidelines, appealing to those who do not enjoy immersive unconventional experiences.

An intriguing result is that hypothesized lower honesty-humility scores in reward preference gamers did not reach significance. Future studies could explore this finding by looking closely at gender differences among gamers. It is possible that different motivations lead to combined expression of preference and personality amongst different gender groups of gamers. Additionally, the male sample demonstrated decreased levels of conscientiousness with increased reward preference, a finding that is opposite of the direction hypothesized. This could be explained by the issues mentioned earlier in regard to social design, elements of cooperative versus competitive gaming preference. It is possible that those motivated by reward design may also be motivated by competitive play and the associated rewards with winning, leading those with a personality type with low conscientiousness to thrive as they are more consumed by their own needs and desires.

Limitations

A major limitation of the current study is its unbalanced distribution of gender. The sample was dominated by male participants, leaving validation of results by gender difficult to validate. Future studies should aim for quota sampling to ensure a balance of gender representation, that allows deeper analysis of gender dependent phenomena in game design preferences and personality correlates.

An additional limitation of the current study was its failure to account for preferential and personality differences that may emerge between preferred competitive and cooperative gamers—that could possibly explain why hypothesized relations were not found in relation to social design. Future editions of the GDP-I should include sub-facet measures of preference for competitive and cooperative play, to see if these measures mediate the relation to overall design preferences, or if these preferences lead to different personality correlates to overall design preference.

Future Research

Overall, the study provides important and compelling exploratory information regarding the fields of personality and independent areas of game design. The study's findings support the idea that personality hold complex relationships with game design preferences. While narrative, social, and reward design can stand on their own in a multitude of games, research going forward should consider the increasing complexity and length of games being released. Mixed game designs are often being released, utilizing competing design elements to create dynamic gameplay that changes with player behavior and choice in game (Adams, 2010).

One such example of mixed design comes in the form of the game BioShock (2K Games, 2007). BioShock, a first person shooter style game, is heavily rooted in immersive narrative (2K Games, 2007). Players are placed in a post-fall utopian society, filled with deranged inhabitants

and constant shifting threats. As the player progresses the story line they are acquainted with other characters throughout the game called “little sisters”. The games story elements provide a rounded picture of these characters, as forlorn children, but also a valuable in game resource if killed and ‘harvested’ (2K Games, 2007). BioShock leaves the player with a choice, kill the little sisters and gain the reward of an in-game resource, or let them live and experience positive narrative outcomes, having enhanced well-being for the characters (2K Games, 2007).

How might players choose how to engage in play in this context? How might their personality relate to their expressed play preferences? With the pressure of two strong design elements, it is likely that measures of personality could indicate how a player will play. If this is the case then, the possibilities of enhancing game design are many. Games could then go on to measure personality traits in play, adapting the game to be an optimal experience for the player. The benefits could extend beyond consumer motivation. Currently, games have been shown to have applications in psychological treatment, and learning. If personality informed design, increases player preference to engage in play, it is reasonable to theorize that efficacy rates of game based psychological treatment and learning could then also be improved.

The road to exploring these possibilities in game design start with more targeted personality and game design based research, with study design that looks for predictive measures of personality to game design preference, aggressive testing of sub-facet relationships to game design preferences, and eventual testing of in game player choice in mix-design game play.

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Appendix A

Game Design Preferences Inventory (Component Names and Items)

Component Name	Item List
Social Design Preference	<p>S1: Good social elements such as chat systems and multiplayer are the most important design feature for me to enjoy a game.</p> <p>S2: I prefer games with multiple live players to interact with.</p> <p>S3: I prefer games with voice and text chat elements where I can socialize with other players.</p> <p>S4: I prefer games where I can play with a group either online or in the same room.</p> <p>S5 (reverse): Games focused on social elements in their design do not interest me.</p> <p>S6: Strong social systems are more important in game design than narratives or reward systems.</p> <p>S7: I can't enjoy a game if it does not include good social elements.</p> <p>S8 (reverse): Good social elements such as chat systems and multiplayer are the least important design feature for me to enjoy a game.</p>
Narrative Design Preference	<p>N1: Good game narratives and characters are the most important design feature for me to enjoy a game.</p> <p>N2: I prefer playing games with strong narratives.</p> <p>N3: I prefer playing games with complex characters.</p> <p>N4: I prefer games with rich histories about the game world.</p>

N5 (reverse): Games focused on narratives and characters in their design do not interest me.

N6: Strong narratives and characters are more important in game design than social elements or reward systems.

N7: I can't enjoy a game unless it has good narratives and characters.

N8 (reverse): Good game narratives and characters are the least important feature for me to enjoy a game.

Reward Design
Preference

R1: Good rewards systems are the most important design feature for me to enjoy a game.

R2: I prefer games where I am rewarded for my actions via ranking up or earning trophies and accolades.

R3: I prefer games with unlockables such as new characters, levels, map areas, and gear.

R4: I prefer games with the ability to earn loot boxes or in game currency based on my performance.

R5 (reverse): Games focused on rewards in their design do not interest me.

R6: Strong rewards systems are more important in game design than narratives or social systems.

R7: I can't enjoy a game if it doesn't have good reward systems.

R8 (reverse): Good rewards systems are the least important design feature for me to enjoy a game.

Appendix B

Provided Definitions of Game Design Types

Type of Game Design	Definition of Design
Narrative Based	Games designed around engaging stories, developed characters, and rich in-game world histories. (Examples: <i>Mass Effect</i> , <i>TellTale Games</i> , <i>Dragon Age</i> , <i>Metal Gear Solid</i> , <i>The Witcher</i> , <i>Undertale</i> etc.)
Social Based	Games designed around social elements such as text and voice chat, couch or online co-op, online multiplayer etc. (Examples: <i>League of Legends</i> , <i>DOTA</i> , <i>Call of Duty</i> , <i>Second Life</i> , <i>Jackbox Games</i> , <i>Final Fantasy XIV</i> etc.)
Reward Based	Games designed around reward systems such as rank systems, loot boxes, unlockables, and trophies or accolades. (Examples: <i>Overwatch</i> , <i>Tekken</i> , <i>Super Smash Brothers</i> , <i>Battlefield</i> , <i>Osu</i> , <i>Hearthstone</i> etc.)

Appendix C

Rotated Component Matrix

Scale Item	<u>Component</u>		
	1	2	3
S2	.859		
S3	.820		
S4	.807		
S8	.802		
S5	.760		
S1	.744		
S6	.637		
N1		.851	
N2		.846	
N3		.770	
N7		.727	
N5		.695	
N8		.666	
N6	-.454	.547	
R7			.698
R8			.691
R5			.683
R3			.671
R1			.670
R2			.624
R6		-.333	.569
R4			.451
S7	.384		
N4		.318	

Note. Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

Appendix D

Reliability Analysis: Component 1 (Social Design Preference)

Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
S1	23.92	88.345	.732	.882
S2	23.05	83.329	.803	.874
S3	23.11	85.250	.801	.875
S4	22.43	85.760	.706	.884
S5	22.87	89.995	.621	.892
S6	24.09	93.853	.633	.891
S7	24.55	99.276	.464	.903
S8	23.01	85.142	.708	.884

Note. The first component was labeled as Social Design Preference with items indicating preferences for design features with social elements like online voice and text chat, cooperative play, and online multiplayer.

Appendix E

Reliability Analysis: Component 2 (Narrative Design Preference)

Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
N1	37.38	52.560	.780	.821
N2	36.90	53.497	.805	.820
N3	37.05	55.105	.710	.830
N4	36.99	61.540	.346	.869
N5	36.28	59.744	.576	.846
N6	37.31	55.809	.532	.851
N7	38.46	52.480	.582	.847
N8	36.78	56.336	.585	.844

Note. The second component was labeled as Narrative Design Preference with items indicating preference for design features with narrative elements like complex characters, rich stories, and developed fictional game worlds.

Appendix F

Reliability Analysis: Component 3 (Reward Design Preference)

Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
R1	28.79	57.815	.569	.779
R2	25.16	57.325	.558	.781
R3	24.19	59.640	.502	.789
R4	26.42	60.732	.375	.810
R5	24.67	59.844	.502	.789
R6	26.11	60.021	.528	.786
R7	25.97	57.384	.616	.773
R8	24.87	57.761	.543	.783

Note. The third component was labeled as Reward Design Preference with items indicating preference for design features with reward elements like in game currency, loot boxes, and experience gain.