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Recategorization of Video Game Genres

Identifying Information Goes Here

While the categories that are typically used to discriminate games have been useful in the past, more recently game mechanics have become utilized by a wider range of games, leading to earlier definitions becoming a less valuable categorization tool. This paper attempts to provide various ways games could be classified by focusing on the types of emotions they evoke, the skills they require or their relations with personality or cognitive variables. A description of those categories and the challenge in using them to define games is outlined as well as five alternate methods that may help make distinctions between games clearer.

INTRODUCTION

Action. Adventure. Role-Playing. First-Person Shooter. Strategy. These are some of the most common descriptors used for video games to categorize them into a particular style of gameplay so that the game player knows what type of game they will be playing. However, in recent years, games have borrowed gameplay from multiple genres in order to make their own game successful to the point that those game categories are no longer informative. When a player purchases a game and it's labeled as an "action adventure first-person shooter strategy game", the player might have some idea that all of these elements will be integrated into gameplay but it's not clear exactly what that game will actually be like. This is largely because current categorization is based on game mechanics; the rules for game play and the underlying constraints on action within the game. For example, action games frequently have mechanics that specify how fast a player can run or how far the player can jump. Strategy game mechanics specify the rate at which resources can be generated and deployed. Role-playing games specify the rate at which a character advances and constrains the types of abilities the character may have on the basis of those abilities. While these types of mechanics have traditionally categorized a certain type of genre the melding of these styles of gameplay means that these genres no longer provide a clear understanding to the player about what experience they will engage in upon playing the game.

The Need for Recategorization

Beyond the need to understand the style of gameplay from the player perspective, this lack of distinction in game genres has important implications for research. Frequently, research on video games involves studies of expertise with comparison of expert gamers to novice gamers. Yet, if genres have become superfluous constructs for understanding differences between games, this means that it has also become difficult to draw distinctions about expertise in regards to the types of games played. In other words, drawing these conclusions becomes difficult if a clear understanding of game play is not known as there is well known literature that suggests that skill is domain dependent (e.g. Chase & Simon, 1973). This would suggest that experts in one genre might not be as effective when playing in another genre and a game that contains multiple genres might confound comparisons by the researcher. Therefore understanding the genre that is being utilized in research comparisons involving game play is necessary to understanding video game expertise.

Additionally, there may be value in comparing across genres in game play for research. For example, many studies investigating violence and video game play compare a violent game versus a non-violent game but frequently confound the type of game play between the genres in the analysis (c.f. Sestir & Bartholow, 2010). First-person shooter gameplay, as the violent exemplar, will typically emphasize reaction-time play skills. In contrast, a nonviolent exemplar might involve a strategy game that emphasizes planning behavior. When these two are compared in the research, the disparate genres limit conclusions that can be drawn as any differences in behavior may be due not only

to differences in violence depicted but style of game play as well.

Examples such as these suggest that understanding and clarifying the genre of gameplay becomes important from a research perspective. Below we will highlight multiple taxonomies that could act as more concrete ways to distinguish between video games, and potentially replace the current use of genres. This will include categories that are based on aesthetics, control action, psychological effects of game attributes, and categorization by perceptual/attentional/cognitive enhancement.

Categorization by Aesthetics

One approach to game categorization may be through the use of aesthetics. Hunicke, Marc, & LeBlanc (2004) discuss the relationship between Mechanics, Dynamics, and Aesthetics in game design. This argument was that aesthetics are the underlying reason players return to a game. They listed eight different core aesthetics that included sensation, fantasy, narrative, challenge, fellowship, discovery, expression, and submission. Each of these aesthetics provides a core reason why a player would return to a game whether it was because they enjoyed playing as someone else (fantasy) or because they enjoyed novelty and surprise in a game (discovery). In other words, this categorization system attempts to define games by the purpose of play rather than the underlying mechanics. So a player that wanted to return to a game for the visuals is motivated by the sensation aesthetic while another player that returned to a game for the story might be driven by the narrative aesthetic and not care about the sensation aesthetic. Hunicke et al. suggested that these are how games should be categorized: Not by *how* the player plays the game but by *the reason* they play the game. This would allow for comparison across games through their underlying aesthetic.

Categorization by this mechanism would be advantageous over the current categories because it outlines comparisons that are goal-based, rather than mechanic-based. So games that were previously categorized by the same genre and mechanics, such as first-person shooter games like Call of Duty and Half-Life, would be categorized through their purpose instead (competition versus

narrative, respectively). This would also allow games that have very different gameplay but the same goals/aesthetics to be identified as the same, such as Overcooked and Words with Friends that have very different mechanics but whose core aesthetic and purpose is to share an experience with others (fellowship).

Categorization by Control Action

Many games have similar layouts in regards to control schemes for manipulating the in-game avatar or the game environment. Further, various games have different constraints in regards to how much error can exist in these controls before the player will fail in regards to game play, the frequency of interaction required to maintain control of the game, and the consistency of movement throughout the game. These similarities in controls could potentially be utilized as another defining characteristic for classifying games can be categorized on the types of control activities or control inputs utilized to play the game.

The first aspect, *frequency of interaction*, would reflect how often a player must interact with the game to avoid failure. Some recent games which require little to no input, such as Cookie Clicker, could be placed in contrast against high-input games such as League of Legends which requires a large degree of input. The second control related comparison is based on the *degree of error tolerance* in a game. This would equate to how many errors a player can make (if any) and still be successful in a game. A game such as Dark Souls would have very little error tolerance – a single misclick or wrong action leads to failure – while a game such as Horizon Zero Dawn has a much higher error tolerance – there are instead multiple ways to be successful in the same situation. This is highly related to *consistency of movement*, the next aspect. This dimension is concerned the consistency with which the game is controlled. Is one button used to move an avatar and the action of control is always exactly the same? Or are there a multitude of separate controls that change throughout the game or depend on specific sub-components of the game? For instance, Grand Theft Auto is largely inconsistent – sometimes you are controlling an avatar using one set of control principles, other times you are driving a car or flying a plane with

another set of controls, and there are also puzzles throughout that have their own sub-controls.

Our final dimension for this categorization scheme is *control movement type*. Many tablet and smartphone device games feel similar because the types of tasks used to achieve action in games are all similar physical actions including swiping, tapping, dragging, and holding. These direct manipulation control inputs are in distinct contrast to controller inputs (pressing of buttons, holding, swivel of joysticks) and computer-based actions (pressing of keys, movement of mice, typing). Games that are isomorphic in terms of control inputs (e.g. keyboard movement versus joystick movement in a game resulting in the same in-game activity) may appeal to a certain type of gamer compared to other distinct control inputs.

Categorization by Psychological Effects of Game Attributes

Perhaps a better categorization scheme is to identify which skills are central to game play. For example, mental rotation skills and spatial reasoning might be central to playing a game like Tetris or Candy Crush while problem-solving ability might influence performance in puzzle-style games like Floors. There are multiple skills that can be trained or learned through gaming environments. A thorough review and synthesis was conducted by Wilson and colleagues (2009) that examined the relationships between game attributes and learning outcomes. In this article the authors posit that games can effectively be used as a method of education and training. Here we take a different approach instead where we argue that the very skills elicited by a game are a defining characteristic of that game, and therefore, a way to conceptually categorize games into groups.

The attributes discussed by Wilson and colleagues are each coupled to a specific outcome in the gamer. A large subset of these are posited to be related to the game player’s motivation. These include fantasy, representation, mystery, feedback, and rules/goals. Some of these attributes are also related to skill-based learning, along with another set of different attributes. These include amount of control, learning through game interaction, fantasy, and representation. Finally, there are some aspects of games that will influence cognitive processes and

learning, including challenge, adaptation features, and conflict.

Summary Table of Elicited Attributes in Gamers

Psychological Construct	Game Attribute
Motivation	Fantasy Representation Mystery Feedback Rules/Goals
Skill-based Learning	Amount of control Learning through game interaction Fantasy Representation
Cognitive Processes & Knowledge	Challenge Adaptation features Conflict

Categorization by Perceptual, Attentional & Cognitive Benefits

It is pretty well established that video games (in particular, first-person shooter or action video games) provide cognitive, attentional and perceptual benefits for the user (e.g., Green & Bavelier, 2003; but see Boot, Blakely & Simons, 2011). Colloquially, people readily accept the idea that video games might improve “hand/eye coordination” and, while that might be true (Griffith, et. al, 1983), there may be other, more important benefits. Videos games are a great “work out” for the visual system, and it might be possible that users would seek to play certain kinds of video games to strengthen certain aspects of visual processing. To make an analogy, if video games are like “vitamins” for the visual system, it might be interesting to categorize video games based on what sort of “nutrient” they provide. For instance, if somebody is experience a relative deficiency in their useful field of view, what sorts of video games might improve that ability?

Table 2 presents five perceptual, attentional, or cognitive attributes that have been shown to improve after training with particular video games. In each of these studies, non video-game players were recruited to play 20-50 hours of the listed video games and their abilities were tested both before and after the training.

Sample Summary Table of Perception & Attention Attributes Reportedly Improved by Video Games

Perceptual, Attentional, or Cognitive Attribute	Video Game	Citation(s)
Visual Acuity	Unreal Tournament 2004	Green & Bavelier (2007)
Contrast Sensitivity	Unreal Tournament 2004; Call of Duty 2	Li, et al (2009)
Useful Field of View	Medal of Honor: Pacific Assault; Unreal Tournament 2004	Feng et al. (2007); Green & Bavelier (2006)
Mental Rotation	Medal of Honor: Pacific Assault	Feng et al. (2007)
Problem Solving	Portal 2	Shute, Ventura & Ke (2015)

It is important to note that while these findings are suggestive, they have not yet been evaluated using a placebo-controlled, double-blind methodology, the gold standard experimental design needed to be able to make health benefit claims. Until such rigorously controlled studies have been conducted, these results must be considered only suggestive. Nonetheless, there may come a time when an older adult suffering from reduced contrast sensitivity and diminished useful field of view may be directed to play several dozen hours of a first-person shooter video games to improve their perceptual functionality.

Categorization by Game User Reactions

Phan, Keebler, & Chaparro (2016) validated a metric of user reactions to their experience playing a video game. This work utilized previous scales on reactions to playing video games, but was more psychometrically sound. Utilizing large

sampling methods (i.e. Exploratory Factor Analysis & Confirmatory Factor Analysis) to determine the factor structure of user experience during video games, Phan et al. developed the Game User Experience Satisfaction Scale (GUESS) measure. This scale assesses 9 distinct constructs aimed at understanding the most enjoyable aspects of a video game. These dimensions include usability, enjoyment, play engrossment, narrative, audio aesthetics, visual aesthetics, creative freedom, personal gratification, and social connectivity.

We posit that the GUESS could further be utilized as dimensions for classifying games into more meaningful genres. Providing a score on each of these dimensions could give greater insight into the various aspects of games and user reactions to those games. For example, if someone’s favorite game is high in visual aesthetics and narratives, this could provide insight into other games they will like that are also high in these attributes.

One issue with using the scale this way could be its subjectivity. The same game could easily elicit different levels across the 9 factors in different individuals. Therefore, it would be important to establish benchmarks for particular games and compare similar games to one another in regards to these benchmarks. This scale does not necessarily reflect certain game attributes i.e. a multitude of game types could be rated high on visual aesthetics. Potentially coupling average GUESS scores to a game alongside its aesthetic dimensions could provide insight into whether the game fits a certain player profile, and therefore, could be used as a genre and as an indicator of player expertise for that particular game style.

DISCUSSION

Video games offer a rich milieu in which to study human behavior and performance. Arguably, every human behavior, every thought and every emotion that exist in real life can be mirrored and studied in a virtual context. If this statement is accepted, then similarly to studying how human behaviors varies by culture, researchers will be motivated to determine how human behavior varies in the online environment. Does what we currently know about constructs, such as aggression, dominance, helping and empathy, hold true in

virtual, gaming environments? This is an important question as it may lead to new theories and conclusions about human behavior, as well as reinforcing what we already know from studies done in real-life environments.

However, knowledge cannot be utilized efficiently, nor conclusions drawn, unless there is a well-defined and usable way to organize the information gathered. That is why the development of an accepted, viable and usable categorization system for video games is necessary for future research. For example, for many years researchers have examined the relationship between video game play and aggression. And yet, we still do not know the characteristics of that relationship or even if it exists at all. A video game categorization system would allow for research examining video games and aggressive behavior to be conducted and compared in a meaningful, logical way.

This paper presented several viable possibilities for the creation of a video game categorization system. Each, as noted, has its strengths and weaknesses, but combined they address key categorization elements needed for the study of video games. Upon review, it would appear likely that any new categorization system would be multi-dimensional with sub-categories within those dimensions. Taking two or more of the proposed systems, creating a multi-axial approach and using the newly created system to classify video games is a necessary validation step. As a result of the validation process, primary comparison categories may emerge, as well as secondary and tertiary ones. Research may also show that categories may be weighted differently depending upon the focus of the research (e.g. personality based, performance based, or behavioral-based studies).

In summary, this paper proposed several new categorization frameworks for classifying video games. It is clear that the current genres used to categorize video games are not sufficient for organizing and making sense of the research related to human behavior currently being conducted. Each if the proposed systems has value, but it may only be in combination that they can work to provide a rich, viable system for knowledge development in virtual environments. Validation research for any new classification system will be an important first step in acceptance of a new system.

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