Redefining Videogame Reward Types

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ABSTRACT
The aim of our research is to iteratively refine and begin validating a proposed videogame reward typology and its associated definitions. A mixed methods approach has been taken so as to best evaluate and refine the taxonomy. The views of an expert focus group have been explored and considered. Separately, a review of the videogame rewards observed within recreational videogames has been undertaken and analyzed. The collective findings of both the focus group and the videogame reward review have prompted the redesign of an existing videogame reward taxonomy, resulting in more robust definitions with increased applicability.

Author Keywords
Reward; videogame; motivation; player experience

ACM Classification Keywords
K.8.0 Personal Computing: General- games; H.1.2 User/Machine Systems: Software Psychology.

INTRODUCTION
Rewards are a defining characteristic of videogames. Whether a player is leveling up, looking for ammo, or just generally trying to win the game, videogame rewards play a guiding role in the player experience. As well as providing information about the state of play, videogame rewards provide players with feedback of success that is thought to promote positive affect. Research investigating the impact of videogame rewards has largely been context specific; examining a distinct class of reward that appears within a single game or gamified application, such as the impact of cosmetic items (e.g., hats) (Moore, 2011), badges (Denny, 2014), achievements (Mekler et al., 2013) and point based leaderboards (Denny, 2013; Mekler et al., 2013). Such research has led to interesting insights, though the generalisability of this approach represents a small sample of the reward diversity within recreational videogames.

By examining various types of videogame rewards, including those that are largely unrepresented, researchers and developers may discover that certain reward forms have distinct impacts on the player experience. Understanding the impacts of various videogame reward types will allow researchers and developers to take a more informed approach to game design. For example, rewards that increase enjoyment could be used in recreational games; rewards that create increased user engagement could be a point of focus for the developers of educational games; and rewards that promote positive affect may be emphasized to create mood management games.

Further, by using a reliable categorization system for videogame rewards, researchers could assess videogame rewards in a more generally applicable way; allowing for a broader understanding of the impacts and effects of videogame rewards on the player experience. However due to the scarcity of research in this domain there is currently no reliable method for categorizing videogame rewards (Phillips et al., 2013). This study seeks to address the lack of reliable videogame reward typologies by further exploring the current usage of videogame rewards in games, and evaluating the strengths and weaknesses of existing videogame reward categorization methods. Our previous research in this field, which examined existing videogame reward typologies and described a revised system for classifying videogame reward types (Phillips et al., 2013), is expanded upon by conducting an expert focus group, as well as a review of the videogame rewards that have been observed within 60 recreational videogames. Results from these studies have been analyzed and subsequently assimilated within the emerging videogame rewards taxonomy. These studies are part of a larger program of research that is focused on producing a valid and reliable videogame reward type taxonomy. The development of such a taxonomy will give researchers the ability to assess the impact of videogame rewards in a generalizable and expedient manner.

BACKGROUND
Rewards are often classified as either intrinsic or extrinsic depending on the way that an individual perceives and attains a reward (Cameron et al., 1994). For example, money made by playing the piano as part of an orchestra would be considered to be an extrinsic reward, while the achievement of playing a difficult song is an intrinsic reward. Research has demonstrated that rewards impact on motivation (Ryan et al. 2000a; Ryan et al. 2000b). Rewards that promote feelings of competence may increase intrinsic

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motivation (Deci et al., 1999). Alternatively, if a reward is auxiliary to a behavior (for example, being paid to perform a service), it is thought to be extrinsic and to lead to reduced feelings of autonomy (Ryan et al. 2000a; Ryan et al. 2000b). As a result it may detract from intrinsic motivation (Deci et al., 1985). However, the degree to which extrinsic behavior impacts on feelings of autonomy varies. To illustrate this point, an extrinsically motivated behavior such as earning money by playing violin in an orchestra could be examined from two different lenses. If the violinist is playing only to earn money, it is probable that doing so detracts from their subjective autonomy. In contrast, if a violinist plays in an orchestra because they find their work meaningful or valuable to their career, such a behavior could still facilitate positive feelings of autonomy.

While intrinsic motivation remains an important area of focus, the majority of activities that people engage in are not intrinsically motivated (Ryan et al. 2000a; Ryan et al. 2000b). Rewards are inherent to extrinsic motivation, with almost all extrinsically motivated behaviors being a form of reward seeking or punishment aversion (Ryan et al. 2000a). In the context of videogames, this means that game systems can utilize rewards to create spikes in player engagement while players explore the game and its rewards (Nicholson, 2012).

Ultimately, the delivery of videogame rewards appears to be a common approach to increasing user motivation within videogames and the gamification space. While the debate around the effect of rewards on intrinsic and extrinsic motivation, and the importance of designing for intrinsic motivation will continue, the use of videogame rewards is effective in prompting the elicitation of heightened response rates (Denny, 2013; Hamari et al., 2014). This suggests that videogame rewards could also be leveraged by gamified applications that seek to motivate user behaviors. Examining a more diverse assortment of videogame rewards than badges, achievements, leaderboards and points, may also uncover unexpected player motivators.

Current Videogame Reward Typologies

Developing a classification system for videogame rewards appears to be a problematic challenge, in part due to the diversity of rewards that appear in games. Relatedly, in order to be able to classify videogame rewards, it is necessary to clearly define which game elements do and do not qualify as rewards. Previous research has often lacked such clear definitions and as a result, the utility of categorization systems has been somewhat limited. Despite this limitation, early videogame reward classification systems have filled an important gap in our understanding of videogame rewards, and have laid the foundation for future work. The most prominent of these classification systems is Hallford and Hallford's computer role-playing game reward taxonomy. This taxonomy proposes four types of game rewards: rewards of access, rewards of facility, rewards of sustenance, and rewards of glory (Hallford et al., 2001). While Hallford and Hallford developed their reward system with respect to roleplaying games, it has since been proposed by others (Salen et al., 2003) that their classification system is applicable to a wider variety of games.

Previous Study Approach

In our previous work assessing the effectiveness of applying Hallford and Hallford reward types to videogames, we determined that it was necessary to formally define videogame rewards to reduce ambiguity (Phillips et al., 2013). It was particularly important that videogame rewards and videogame behaviors were clearly distinct. In terms of colloquial use, people interchange behaviors that prelude a reward with the reward itself (for example the behavior 'searching for loot' is called a reward, as opposed to 'items' which may be gained by searching for loot). Similarly, it was important to isolate the context within which a reward should be formally considered a videogame reward, as some systems allow for in-game behaviors to be rewarded outside the context of videogames.

To overcome these challenges, videogame rewards were ultimately defined as: *"A positive return that serves to reinforce player behavior within a videogame."* (Phillips et al., 2013). Key criteria were identified to support the definition: a videogame reward must be delivered within the videogame it originates from (e.g. money for winning a videogame related tournament is not a videogame reward) and the effect of the reward must be experienced within the game. Importantly, a videogame reward is only a reward at the time at which it is delivered – after this initial event it is considered a part of gameplay (e.g. a sword given to the player's avatar is a videogame reward, but the moment to moment use of that sword does not qualify as distinct reward occurrences (Phillips et al., 2013).

This definition was applied to a number of videogame rewards that had been coded through a videogame review (Phillips et al., 2013). Preliminary analysis of Hallford and Hallford's reward forms revealed that there were issues in the classification system (Phillips et al., 2013), in that rewards of glory is a very broad category, encompassing anything that does not immediately impact moment to moment gameplay. Relatedly, rewards of glory were found to be a dominant category in many games (Phillips et al., 2013). To increase the utility of the taxonomy, categories in the taxonomy were redefined, and new categories were developed as a means to address gaps and omissions. The classification system depicted in table 1 emerged (column 3 indicates whether the category was retained from the original taxonomy (Hallford et al., 2001), revised based on their category or emerged as a new category (Phillips et al., 2013).

Reward Type	Characterised By	Taxonomy
Access	Unlocked game content	Retained
Facility	Avatar enhancements	Retained
Sustenance	Burden mitigation	Retained
Glory	Score systems	Revised
Positive Feedback	Flattery and praise	Emergent
Sensory Feedback	Affective visual/aural/tactile feedback	Emergent

Table 1: Videogame Reward Taxonomy

Rewards of Access allow players access to new locations or resources that were previously inaccessible (Hallford et al., 2001). Rewards of Facility enable a player's avatar to do things that they were not previously capable of, or enhance abilities that they already possess (Hallford et al., 2001). Rewards of Sustenance are typically rewards such as extra lives or extra health that help to prolong a play session (Hallford et al., 2001). Rewards of Glory do not directly impact gameplay and are quantifiable in the game or meta-game (Phillips et al., 2013). Rewards of Positive Feedback are flattery or praise from the game or in-game characters, communicated in the form of language (written or spoken) (Phillips et al., 2013). Rewards of Sensory feedback serve a purpose beyond notifying the player about changes to the game state (Phillips et al., 2013) (for example, golden sparkle effects that emanate from a puzzle piece when it is put in place.).

CURRENT STUDY APPROACH

The current research consisted of two studies designed to partially assess the reliability and validity of our revised reward taxonomy. To do this, a focus group involving experts in the domain was carried out to ascertain how experts think about videogame rewards, including how they would define them, and how they might categorise them. Separately a review of in-game videogame reward instances was conducted, in which two raters identified and assessed a series of rewards in games, and sorted them by reward type, based on the revised reward types developed in our previous work (Phillips et al., 2013), and refined through the focus groups. The objective of the focus group is to ascertain what videogame experts consider to be videogame rewards, and to investigate how they would classify those rewards. The focus group outcomes directly informs the videogame reward instances review, which seeks to ascertain whether or not the videogame rewards taxonomy's reward type definitions can reliably be applied by different raters, and to determine the adequacy of the scope of our current definitions across a range of games. A larger sample size than used in our previous work will be examined to further ensure the generalisability of the proposed taxonomy.

FOCUS GROUP STUDY

A focus group consisting of five videogame experts (videogame researchers with development experience) was conducted to determine how experts in the field think about videogame rewards. Two of these experts were familiar with Hallford and Hallford's reward types. Participants were asked to reflect on their own experience playing games, and to report their most memorable interactions with videogame rewards. Once a list of these videogame rewards had been developed, participants were tasked with classifying and sorting them into a categorization system of their own collective design.

Subsequent to this activity, participants were briefed on our revised videogame rewards taxonomy, and were asked what they felt about the applicability of the proposed taxonomy to their own reward examples, and how it compared to the categorization system they had designed.

FOCUS GROUP RESULTS AND DISCUSSION

When asked to recall and discuss rewards they had experienced while playing games, participants listed a wide range of reward types. This range of responses further highlights the value of a videogame reward typology. Participants considered how they would categorise these rewards and how these rewards fit with the existing taxonomy.

Rewarding Game Experiences and Game Reward Types

The following responses were received when focus group participants were asked about their most rewarding game experience.

P1: *"... weapon unlock .... At the end of the day I'm a sucker for it... So it's unlocking the gameplay."* P1 isn't discussing a particular game experience, but rather a type of reward that might be received across different games. This is an example in the existing taxonomy of a reward of access although as discussion later demonstrates it may also be a reward of facility.

P2: *"I think the most rewarding thing ever given to me by a game was just when I get legendary, like, 'Legendary!' in like, Unreal or League of Legends or something. … It's a hard-to-get announcement and the way he says it is pretty cool… And all the players in the game hear it ... an acknowledgement of my skill in the game.*" P2 appears to feel rewarded by the stylistic feedback that these games are providing. In the existing taxonomy, this reward would likely be considered a reward of sensory feedback. Separately it may be viewed as a reward of positive feedback depending on the context of the verbal praise.

P3 [referring to The Elder Scrolls V: Skyrim]: *"My favorite experience in being rewarded as far as finally getting to* [level] *one hundred in 'Destruction Magic'. I'm a sucker for being a mage all the time and blowing people up with flames, and getting that final spell. The master level fire spell – it's pretty good. Mostly getting to the hundred because then you can do anything."* P3 feels rewarded by an increase in her avatar's proficiency, and the mastery associated with completing a skill tree. In the existing reward types taxonomy, this would likely be considered a reward of facility, as there is an emphasis on gaining increased mastery over the game world.

P4 [referring to the game Theme Park]: *"Yeah, it was that I made an awesome park… like the hand popping up, being like, 'hey, you've got lots of people in your park'. Um, I guess it's a measure of success in a game that doesn't really end? ... when you know you have a successful theme park."* P4's appears to see feedback of success as a reward. This may be seen as either a reward of glory (it is essentially a scoring or ranking system). Depending on the context of the game's dialogue, this reward may also be considered to have an additional reward of positive feedback depending on the context of the game's dialogue and how congratulatory it is.

P5 [referring to The Legend of Zelda: Ocarina of Time]: *"Getting Epona* [a horse] *... you've already spent probably like an hour or so running across fields ... a fifteen minute journey is reduced to like, a minute now ... also just the story sequence as well that's involved with it, there's quite a tough challenge that's involved with it ... I think it's kind of clumped together. ... the player experience that is, it's like one kind of release."* P5 appears to be discussing two kinds of rewards that occur at approximately the same time. One is that the player gains a new ability in the form of a horse. Separately, the player is also rewarded with an entertaining narrative cutscene.

Focus Group Categorization of Rewards

During the focus group, participants were asked to consider a range of videogame rewards consisting of the rewarding experiences outlined above as well as other rewards that they recalled during the activity. Participants recorded these reward examples on post-it notes and then were asked to design their own system for categorizing the videogame rewards that had emerged during their discussions.

Facility / Access

After some initial sorting had occurred, participants assigned the headings 'Facility/Access' to reward clusters that fit those definitions, likely based on previous exposure to Hallford and Hallford's reward forms. Reward examples included: Getting Epona [a horse in The Legend of Zelda: Ocarina of Time]; Weapon unlocks; Cool spells [referring to magic spells from The Elder Scrolls V: Skyrim]; double jump [an avatar ability in many platform games].

P5 identified *"Any sort of progression or achievement is a reward"* and that accessibility is an important element *"I think to qualify this ... it's not abundant or that it has some sort of rarity to it ... if it is a reward of access, then, it's something new or something that's hard to get"*. P2 defined facility as enabling *"a skill that you couldn't do before"*.

Aesthetics

Participants also developed a category which they called 'aesthetics', which they considered to be rewards that are beautiful to look at or hear (this largely overlaps with rewards of sensory feedback). Rewards included: heads being cleaved off [fatality mechanic in Age of Conan]; scenery after climbing a mountain; cool outfits; hats [Team Fortress 2]; Headshot sounds [Battlefield 3].

On this topic, P1 said "Like level up *sounds – the WoW [World of Warcraft] ones are pretty epic. Actually, also when you're sniping in BF [the Battlefield series of games], hearing the thud of the headshot is actually more rewarding than getting the headshot*." For reference, in the game *World of Warcraft*, when a player character levels up, they are engulfed in a pillar of light that is accompanied by a loud chime; the event is quite dramatic, and is colloquially referred to by players as 'dinging'. P5 also added that "*[aesthetics] provides sensual pleasure*" and P1 said "*A lot of the games I have worked on have used visual rewards for things*".

P5 identified that some rewards classified as "aesthetic' might also be rewards of access. When the researcher asked the team about their Facility/Access category P5 said "*I think it's some of the aesthetic stuff we have been talking about as well, like a cutscene or a particular animation"*.

Dominance

Participants supported the idea that certain voiceovers from some multiplayer games may be a reward type, which they titled 'dominance'. Examples used were short statements such as 'legendary!' (an announcement made by the game in *League of Legends* when a player has killed numerous opponents without dying), as well as '*dominating!*' and '*multi-kill'* (announcements made in *Unreal Tournament*). These statements were spoken by participants with strong verbal emphasis, reflecting the bravado and tone with which they are announced by the commentator in their respective game. As such narration is directly tied to successful actions in the game it may be considered a form of verbal praise.

Trophies, Completion and High Score

Several categories, which participants called 'trophies', 'completion' and 'highscore' also emerged, which contained rewards that appear analogous to rewards of glory. P4 seemed to suggest that there was a relationship between these topics by saying *"Have we really talked about the difference between highscore, completion and trophies? Like highscore is something you do to beat your score, but you get trophies for completing or high*

scoring…". Reward examples for trophies included: 'Shinies' [Pokemon Series]. Reward examples for highscore included: People in park [referring to the game Theme Park]; Getting a high score [Wii Party U]. Reward examples for completion included: Getting to max level [The Elder Scrolls V: Skyrim]; Placing in tournaments [external game activity]; beating gym leaders [Pokemon series]; Finishing a hard level [Mario Galaxy]; Getting to the end of a game.

Relatedness

Additionally, participants also proposed a type of reward with no parallel in the videogame rewards taxonomy, using the category heading '(positive) relatedness'. The rewards clustered into this category do not fit the current videogame reward definition, and may instead be intrinsically enjoyable activities or behaviors. Examples of this category type included "*Taking a noob [a novice player] under your wing*", which appears to be the behavior of taking care of another player, rather than getting some sort of objective return. Similarly, "*looking after a Tamagotchi [a digital pet keychain]*" does not have a return, but rather a behavior state of taking care of the digital pet. While playing with a Tamagotchi, feeding the Tamagotchi to increase the Tamagotchi's health, would qualify as a reward of sustenance, while independently the act of using that reward may be "*looking after a Tamagotchi*".

Focus Group Categorization and the Proposed Videogames Reward Taxonomy

Following the development of their own categorization system, the focus group facilitators introduced the proposed videogames reward taxonomy, probing for its strengths and weaknesses. While introducing the concept of glory, P4 said "*I think we've made it a bit more specific here. Like yours could encompass a few of them. Like trophies and highscore*". This reflects their own findings that 'highscore', 'completion' and 'trophies' were somehow interconnected.

Participants appeared content with the revised taxonomy categories 'access' and 'facility', especially as they had included these titles in their own categorization system. However, there was substantial discussion among the experts in relation to the deference between access and facility. When discussing two specific examples (unlocking a new game level [access], finding a power-up that makes you invincible [facility]), one of the participants unfamiliar with the categorization system commented on how facility is different to access *"I see how there is a distinction there where unlocking a new mode is like a separate thing."*[P4]. However P1 questioned whether or not the distribution of a weapon was a reward of access or a reward of facility, *"So is a new weapon facility or access?"* to which P5 replied *"It could just be access too if there's no new facility, really, so if it's just like a visual change, yes"*.

For reference, in the taxonomy's current form a weapon would be generally be considered a reward of access, as the player is gaining access to something that they previously did not have access to; however, the line between this and the player gaining a new ability is somewhat blurred. The distinction becomes even less apparent when the weapon offers unique functionality, similar to those of avatar abilities. This may suggest that the distinction between rewards of access and rewards of facility may not be intuitive, or that the definitions may require refinement.

There was minor dispute about the category of 'sensory rewards' principally because of the inclusion of tactile feedback. Like other forms of sensory feedback, participants suggested that tactile feedback is only a reward if it is somehow unusual in its occurrence (if the design is intended to promote positive affect). This reflects the chief criticism of this reward form, that the difference between a reward of sensory feedback and normal game state feedback is largely reliant on whether or not the design of the feedback is geared towards promoting positive affect.

Participants suggested that their dominance category could be analogous to rewards of positive feedback. Participants also felt there was some issue with the term 'positive feedback', in that it is rather vague about what form the feedback could take, asserting that "*Positive feedback is such a kind of general term. It doesn't really say what it is*" [P1]. There was agreement that rewards of positive feedback should be renamed to better highlight their focus on praise and flattery. Based partially on this it was noted that refinements to category names and definitions may be required to increase the usability of the categorization system.

Participants didn't describe any instances of rewards of sustenance, though one participant did raise the question "*What about maintaining the status quo? Is that rewarding? You're not losing, but you're not progressing*" [P2]. However, after introducing the category, participants agreed that it is a unique type of reward. Several participants suggested that the reason that they didn't think of it was that they were focused on rewards that they find particularly rewarding, and that receiving a reward of sustenance is not a memorable event. The following exchange demonstrates this point:

> P5: *"Apparently we don't care about that sort of thing."*
> P1: *"Is that a frequency thing?"*
> P5: *"Yeah, it's maybe one of those lower level rewards so we don't really think about it as much."*

Another point of interest is the participants' design and inclusion of the '(positive) relatedness' category. Further evaluation suggests that these are not videogame rewards, as there is no discernable return from the game. The examples given are in fact enjoyable activities and behaviours that form gameplay. As such, the reward taxonomy was not updated to include this category.

General Focus Group Discussion

In reference to exploring, one participant said "*I think it's pleasurable, but not necessarily rewarding, because that is like playing a game. I'm getting enjoyment out of that – but am I being rewarded for exploring?*" [P1] to which another participant responded "*Maybe the game being rewarding is a different type of experience, but not a reward*" [P3]. This is in line with the videogame reward definition proposed in earlier work, which sets aside behaviours that may be colloquially referred to as 'rewarding' from videogame rewards (Phillips et al., 2013).

Concerns about the transparency of rewards were also made. P1 asked "*Is it still a reward if you don't know that you're receiving it? So a good example would be an attribute boost that you missed the feedback that told you that you received the boost, but you still have it.*" Participants concluded that rewards lacking feedback would still be rewards, but that the transparency of a reward is a vital design consideration. A lack of transparency in the delivery of a reward may reduce the reward's meaningfulness or impact on the player experience.

Discussion around the consumption of game rewards yielded interesting insight into reduced player motivation. "*I've stopped playing [a game] because I wasn't actually getting any rewards, it was just quest after quest and I wasn't getting anything*" [P3]. Another participant added *"A lot of access is like access for the first time and I genuinely just play through games to get to the end. Well, to enjoy the game, but also to get through the story and see the end of the game. There is usually more gameplay there but I don't go back because there's no more story there"* [P5]. This discussion suggests that videogame players will eventually stop playing a videogame when they stop being exposed to novel content or rewards. The detriment to motivation may reflect the diminishment of intrinsic motivation that is said to occur when an extrinsic reward is removed from a system (Deci et al., 1999).

Refining Taxonomy Definitions

While useful for describing rewards, several of the taxonomy's definitions were relatively ambiguous when being applied during a categorization task. As a result, revisions were made to all items in the taxonomy in an effort to create clearer definitions. During this process, rewards of positive feedback were renamed 'rewards of praise' to address the ambiguity concerns raised by participants of the focus group. This name was chosen to better highlight how rewards of praise differ from other forms of rewarding feedback. The following revised definitions were developed:

Rewards of Access

Rewards of access grant the player admission to otherwise inaccessible environments, environmental objects, or game modes (including narrative cutscenes). An example of a reward of access is unlocking a new race track in a racing game, or lowering a bridge so that it can be passed in an adventure game.

Rewards of Facility

Rewards of facility increase the effectiveness of the player within the game state. An example of a reward of facility is the unlocking of a new magic spell or sword within an adventure game.

Rewards of Sustenance

Rewards of Sustenance mitigate burden, such that a negative play state (such as losing all health or running out of ammunition) is less probable. An example of a reward of sustenance is a pickup that restores ammunition or health in a first person shooter.

Rewards of Glory

Rewards of Glory are considered to be videogame rewards that do not impact moment to moment gameplay, and that are quantifiable in either the game or meta-game through points, achievements, badges and definitive victory conditions, such as winning the game. However, Rewards of Glory do not extend to non-quantifiable feedback such as praise from an in-game character or visual feedback at the end of a level. An example of a reward of glory is a badge that represents mastery of the game.

Rewards of Praise

Rewards of Praise communicate (verbally or textually) a form of praise or flattery via game systems to the player. An example of a reward of praise is game text saying "*Great job!*" when finishing a round of a casual game.

Rewards of Sensory Feedback

Rewards of Sensory Feedback provide the user with overt aesthetic or tactile feedback that is designed to promote positive affect in the player. An example of a reward of sensory feedback is a pillar of light that emanates from the player's avatar when it levels up in a roleplaying game.

REVIEW OF IN-GAME REWARD INSTANCES

Method

To determine the efficacy of the videogame reward types, a review of videogame rewards within recreational videogames was performed. To ensure that a variety of rewards were observed, 10-15 minutes of gameplay footage was coded for 60 videogames spanning a breadth of genres. Inclusion criteria for videogames in the review was that they were highly rated games on the popular review aggregation website Metacritic (games rated 80 or above).

This inclusion criterion is based on the assumption that well reviewed games may contain many rewards.

One researcher recorded the reward instances that appeared within each games and established a list of videogame reward instances. While reviewing games, care was taken to prevent multiple entries of the same reward instance being recorded for a single game, as we were specifically interested in evaluating the types of rewards in games, rather than the frequency of particular reward instances. For example, we did not want multiple instances of *"Ammunition pickups that replete player ammo"* to be uniquely coded, even if many ammunition pickups had been observed throughout play.

An additional rater was invited to independently code approximately 20% of the reward instances. The coding system consisted of the six videogame rewards taxonomy categories (i.e. access, facility, sustenance, glory, praise, sensory feedback) and an 'other' category which was used for rewards that did not fit other categories.

Preliminary analysis of the reward review found that there was limited agreement between raters and that there was some confusion as to how the broadest definitions should be applied. As suggested in the focus groups, it was found that rewards of access and rewards of facility were particularly difficult to discernibly distinguish, especially for rewards such as the player gaining access to new weapons. To address this, the scope of several definitions was altered (revised definitions are reported in their associated sub-headings below). Rewards of access were revised so that the definition now excludes access to new items or weapons that change the player's abilities. Conversely, the scope of rewards of facility was broadened so that such rewards (that were previously considered rewards of access) were encompassed within the definition for rewards of facility.

Applying these new definitions, both raters coded the reward instances according to the 7 categories (access, facility, sustenance, glory, praise, sensory feedback, other). Each rater categorized a sample of reward instances that made up approximately 20% of the total reward instance sample. During this categorization process, raters discussed instances of 'other' occurrences, and determined that numerous gameplay behaviors had mistakenly been coded as reward instances in the list of videogame rewards (e.g. "Completing optional quests" and, "Exploring the map") and these instances were excluded from the analysis phase. In some instances, such as where the behavior was a distinct reward seeking behavior (such as "looting items"), the reward instance was reworded to reflect the reward being sought.

Additionally, raters found that some of the recorded instances encompassed multiple rewards, and were incorrectly referring to the reward's distribution mechanic (e.g. 'picking up health, ammunition, guns and experience orbs'); instances such as these were broken into their component rewards (e.g. 'health' and 'ammunition'). On this basis, no rewards falling into the "other" category were found to be remaining.

Statistical Analysis

Cohen's Kappa values were calculated to assess the inter-rater agreement for each category of reward. Agreement occurs when both raters independently categorize a reward instance as fitting the reward type's definition. Doherty proposes that values categorized as < 0 indicate no agreement; 0 – 0.2 as slight agreement; 0.21 – 0.40 as fair agreement; 0.41 – 0.60 as moderate agreement; 0.61 – 0.80 as substantial agreement, and 0.81 – 1 as almost perfect agreement (Doherty et al., 2013).

Results and Discussion

Analysis of the sample of videogame rewards instances (n = 211) shows that there is a high level of inter-rater reliability across all categories. The lowest level of agreement was found in the Glory category (kappa = 0.885), and the highest in the Sustenance category (0.957). This places the full range of reward types well within the range of almost perfect agreement (Landis et al., 1977), suggesting each of the current definitions are unambiguous in their distinction from each other. Moreover, given that all rewards identified were able to be classified using the current taxonomy it seems likely that our definitions allow for the majority of videogame rewards. While using this refined set of reward type definitions there were no recorded observations of a rater feeling that any reward instances could potentially be coded as fitting multiple reward type definitions. This provides important initial support for the reliability and validity of our proposed taxonomy. We were able to classify all of the rewards instances identified in a large variety of games without ambiguity.

In keeping with previous research, it is also worth underlining that all of the games examined featured multiple videogame rewards, often in numerous forms for each reward type. Many of the narrative driven games contained all videogame reward types in some form. While this may be the result of selecting well reviewed games as part of the selection criteria, it further suggests that videogame rewards are a core characteristic of videogames.

Reward Type	Occurrences	Percentage of Total
Access	115	12.56%
Facility	336	36.72%
Sustenance	76	8.30%
Glory	184	20.10%
Praise	49	5.35%
Sensory Feedback	155	16.93%
Total Rewards	915	≅ 100.00%

Table 2: Reward Instance Breakdown

Of the 915 reward instances examined by the primary rater there were 115 cases (12.56%) of rewards of access, 336 cases (36.72%) of rewards of facility, 76 cases (8.30%) of rewards of sustenance, 184 cases (20.10%) of rewards of glory, 49 cases (5.35%) of rewards of praise, and 115 cases (16.93%) of rewards of sensory feedback (see Table 2).

Of the 60 games reviewed, all games contained at least one instance of rewards of access, facility, glory and sensory feedback. Of note, some games did not contain instances of rewards of sustenance or rewards of praise, which echoes past results using the previous iteration of the taxonomy (Phillips et al., 2013). This is thought to be because certain modes of play do not encourage longer play sessions (as would be achieved by including burden mitigation in the form of rewards of sustenance). Of particular interest is that rewards of glory, which appear to dominate the gamification landscape; represents roughly 20.1% of total reward instances. Within the gamification space, the use of rewards of glory is commonplace, such that the term 'pointsification' has been proposed within industry (Robertson, 2010). This result suggests that the focus on rewards of glory in gamification may be somewhat limiting with videogames featuring a large proportion of rewards of other categories that could be equally valuable in gamification.

OVERALL DISCUSSION

One of the core objectives of our program of research is to develop a valid and reliable videogame reward type taxonomy. To this end, our current studies have made substantial headway in refining our proposed taxonomy. Based largely on the findings of the focus group, new definitions and distinctions have been developed for each reward type. These definitions have been successfully applied by separate raters in the review of in-game reward instances. The high degree of agreement between raters suggests that the taxonomy's refined definitions allows for reliable and consistent application.

LIMITATIONS AND FUTURE WORK

Our analysis was limited to positively reviewed games on Metacritic. While care was taken to explore a diverse breadth of games and genres, it is possible that reward types vary for games that are not positively reviewed, and future work should explore this possibility.

When coding rewards, it should be noted that videogame rewards can be given to players without transparent feedback, which may result in rewards being erroneously omitted. Further, the rewards that occur at the beginning and end of a game may differ. For coding purposes, it is advised not to rely on the tutorial sequence of a game as it may not be representative gameplay. Ultimately, this taxonomy exists to facilitate further research into the impact of different types of videogame rewards on the player experience. It is anticipated that future work will extend this taxonomy by evaluating whether reward types impact player's intrinsic or extrinsic motivation. It is our hope that a rich understanding of how each type of videogame reward impacts the player experience will become apparent with further research.

CONCLUSION

The primary contribution of the current study is the iterative development and initial validation of our proposed reward type taxonomy. Using this taxonomy, it is now possible for detailed impacts of various types of videogame rewards to be explored and assessed. Such research will be important in ascertaining the effects of various types of rewards on the player experience, and increasing the general understanding of rewards' motivational pull in recreational games, educational games and gamified applications. This area of study is particularly pertinent to educational games and gamification, both of which heavily rely on the use of videogame rewards to create player engagement. We hope that further research will continue to validate and iterate the videogame rewards taxonomy, and to also explore the impact of videogame rewards types on the player experience.

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REFERENCES

Cameron, J., and Pierce, W. D. Reinforcement, reward, and intrinsic motivation: A meta-analysis. Review of Educational Research, (1994) 64, 363-423.

Csíkszentmihályi, M. Play and intrinsic rewards. Journal of Humanistic Psychology, 15, 3, (1975), 41-63.

Deci, E., and Ryan, R. M. Intrinsic motivation and self-determination in human behavior. New York: Plenum (1985).

Deci, E., Koestner, R., and Ryan, R. A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. Psychological Bulletin 125, 6 (1999), 627–668.

Denny, P. The effect of virtual achievements on student engagement. In Proc CHI 2013, ACM Press (2013), 763–772.

Deterding, S., Dixon, D., Khaled, R., and Nacke, L. From game design elements to gamefulness: defining "gamification." Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, ACM Press (2011), 9 – 15.

Deterding, S., Khaled, R., Nacke, L., and Dixon, D. Gamification: Toward a definition. CHI 2011 Gamification Workshop Proceedings, (2011).

Doherty, G., Coyle, D., and Sharry, J. Engagement with Online Mental Health Interventions: An Exploratory Clinical Study of a Treatment for Depression. In Proc. CHI 2012, ACM Press (2012), 1421 – 1430.

Hallford, N., and Hallford, J. Swords and Circuitry: A Designer's Guide to Computer Role-Playing Games. Prima Publishing, Roseville, CA, 2001.

Hamari, J., Koivisto, J., and Sarsa, H. Does Gamification Work?—A Literature Review of Empirical Studies on Gamification. Proceedings of the 47th Hawaii International Conference on System Sciences. HICSS, (2014).

Landis, J., and Koch, G. The measurement of observer agreement for categorical data. Biometrics 33, 1 (1977), 159.

Mekler, E., Brühlmann, F., Opwis, K., and Tuch, A.N. Do points, levels and leaderboards harm intrinsic motivation?: an empirical analysis of common gamification elements. In Proceedings of the First International Conference on Gameful Design, Research, and Applications, ACM Press (2013), 66 – 73.

Montoloa, M., Nummenmaa, T., Lucero, A., Boberg, M., and Korhonen, H. Applying game achievement systems to enhance user experience in a photo sharing service. In Proceedings of the 13th International MindTrek Conference: Everyday Life in the Ubiquitous Era, ACM Press (2009), 94 – 97.

Moore, C. Hats of Affect: A Study of Affect, Achievements and Hats in Team Fortress 2. Game Studies 11, 1 (2011).

Nicholson, S. A User-Centered Theoretical Framework for Meaningful Gamification. ETC Press (2012).

Phillips, C., Johnson, D., and Wyeth. P. Videogame Reward Types. In Proceedings of the First International Conference on Gameful Design, Research, and Applications, ACM Press (2013), 103 – 106.

Robertson, M. Can't play, won't play. Hide & Seek: Inventing New Kinds of Play., 2010. http://www.hideandseek.net/2010/10/06/cant-play-wont-play/.

Ryan, R., and Deci, E. Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. Contemporary educational psychology 25, (2000), 54 – 67.

Ryan, R., and Deci, E. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist 55, 1 (2000), 68–78.

Salen, K., and Zimmerman, E. Rules of Play: Game Design Fundamentals. MIT Press, Cambridge, MA, 2003.

Zichermann, G., and Cunningham, C. Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps. O'Reilly Media, Sebastopol, California, 2011.