Can the value of power-ups gained affect players collecting valuable items in role-playing games

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Abstract

In many role-playing games, players can use items in the game to make them more powerful. Usually players gain items from defeating enemies. The value of the items may vary. Different items values will render different game experience on players, and different players spend different amount of effort on gathering items. This research examines whether or not there is a relationship between average power-up values a player gets versus the degree he or she wants to collect valuable items, and how this relationship will be.

Keywords: role-play games, item collecting, item value, decision-making

Introduction

In many role-playing games, players will gain power-ups dropped off by enemies defeated in the game. Many times, the items are randomly dropped so that the player might fortunately get a strong item at the early time of the game, or get weak ones most of the time. In some online role-playing games, this will cause the unbalance of power between players since they get different items of different values.

Therefore, many players tend to collect valuable items actively because they sometimes can change the game experience (Filip, 2011). A series of questions hence were raised: Is there any relationship between the item values players get, and the item collection behavior? Can it be a directly proportional relationship that the higher the average value of items a player get, the more the player will want to collect high value items? Or can it be an inversely proportional relationship which means the lower the more players want high value items? This brings out the main focus of this research - whether or not the value of the power-ups a player get from the game will make the player focus more on acquiring valuable power-ups.

There is a common hypothesis that people crave more no matter how much they already have (Schor, 1999). But there is also a social trend that the less people get, the more they want (Jiang & Probst, 2017). While recently there are scholars argue that in games there are also trends that the more a player gets, the more the player would like to acquire. So, specifically for this research, there can be three hypotheses: "The less valuable items/power-ups in average a player gets, the more likely a player want valuable items.", and its opposite hypothesis, and there "null hypothesis": "There is no proportional relationship between the average value of items participants get and the more the participants want valuable items."

In this paper, "power-ups" and "items" share the same meaning hence are used alternatively. "High value items" and "valuable items", "Low value items" and "valueless items" also share the same meaning.

Background

In many role-playing games, there are items of different values for players to pursue. As high-performance items will make players more powerful hence possible to have more fun in the game, people tend to purchase or actively collect valuable items (Rezaei & Ghodsi, 2014). But similar to the real world, people tend to continue to pursue until satiated (Apan,2014, Liddle, 2014). Hereby comes a speculation that people will try to pursue high value items for a good performance in game no matter how many valuable items they have had. It is the belief among the players that high value items/power-ups will help players perform better in games so that no matter how many valuable power-ups players collect, the more, still the better.

While the quantity of the items isn't the only element that affects the getting more valuable items given a context of role-playing games. According to Hsiao & Chen (2016), people will want to get more items when defeated. But also, there is a trend that the less value items players have, the more likely they will lose in an RPG game (Cocosila, 2016). Combining these two arguments, we can see a hypothesis that "The people who get less value items will want to get more valuable items."

Whereas in Hsiao & Chen's (2016) research, one of the reasons that encourage in-app purchase (one way to get better items) is through rewards. This is a positive feedback loop which means good items bring power, such as "Pay-to-win" mechanics (Thier, 2017), and hence you pursue more powerful items because you want to stay powerful. Thus, the logic from this perspective is the more valuable items player gets, the more (at least not the less) the player wants. This hypothesis contradicts with the previous ones. Provided by these disagreements from previous researches, this research was carried out to look into the reason to this.

Concluding all these, this research is two-tailed. The result can be either in the middle: "There is no difference between players who have high value items and who have low ones", or towards either end: "High-value item holders want more high-value items than low-value item holders", or "Low-value item holders want more high-value items than high-value item holders".

For simplicity, we name these 3 hypotheses as shown in Table 1.

Table 1
Three hypotheses to be tested in this research

Low Hypothesis	Low-value item holders want more high-value items than high-value item holders.
High Hypothesis	High-value item holders want more high-value items than low-value item holders.
Null Hypothesis	There is no difference between players who have high value items and who have low ones

If the Null Hypothesis is proved to be true and the result is both of the groups want high value items, this research might support the argument that "Players want more however much they currently have". Otherwise, this research might support "Player try to get more valuable items because they hate being defeated". Of course, the results of this research can also be of help in other aspects.

These three Hypotheses are mutually exclusive and independent.

Methods

Participants:

The study included 17 participants in total. Participants are recruited via social media and other online and offline mediums. Since the genre of the players and the gender and ages of the players are not a major concern for this research, any person willing to participate were permitted to take the experiment.

Experimental Design:

This research simulates a game experience where the participants play a fictional role-playing game called "Robot Abort". In this simulation, players fight enemies in story mode and online match mode, getting dropped items after winning. In order to make this experiment focused more on research, the players cannot control the character, and are only provided options to choose which determine the dependent variables.

There are 4 dependent variables and 1 independent variable as shown in Table 2. The derivative DV "degree the player wants valuable items" is calculated by the other 3 DVs, converting boolean to integer (false to 0, true to 1). The higher the value is, the more the player wants valuable items.

Table 2
Research Variables

Type	Variable Name	Type
DV	Searching the map for valuable items	boolean
DV	Picking up item deserved by other players	boolean
DV	Giving away items	boolean
DV(derivative)	Degree the player wants valuable items	integer
IV	Value of items the player gets in the game	Enumeration ("Low", "High")

Tools:

This research uses the Study Crafter to make a scenario helping implementing the research design. Study Crafter is a free online collaborative platform where users can build research projects on human behavior. It enables users to create game-like projects to engage their participants. It also features an easiness of distribution.

Procedure:

The application for research contained the following 6 stages:

Brief. Where participants are notified the dependent variables to measure.

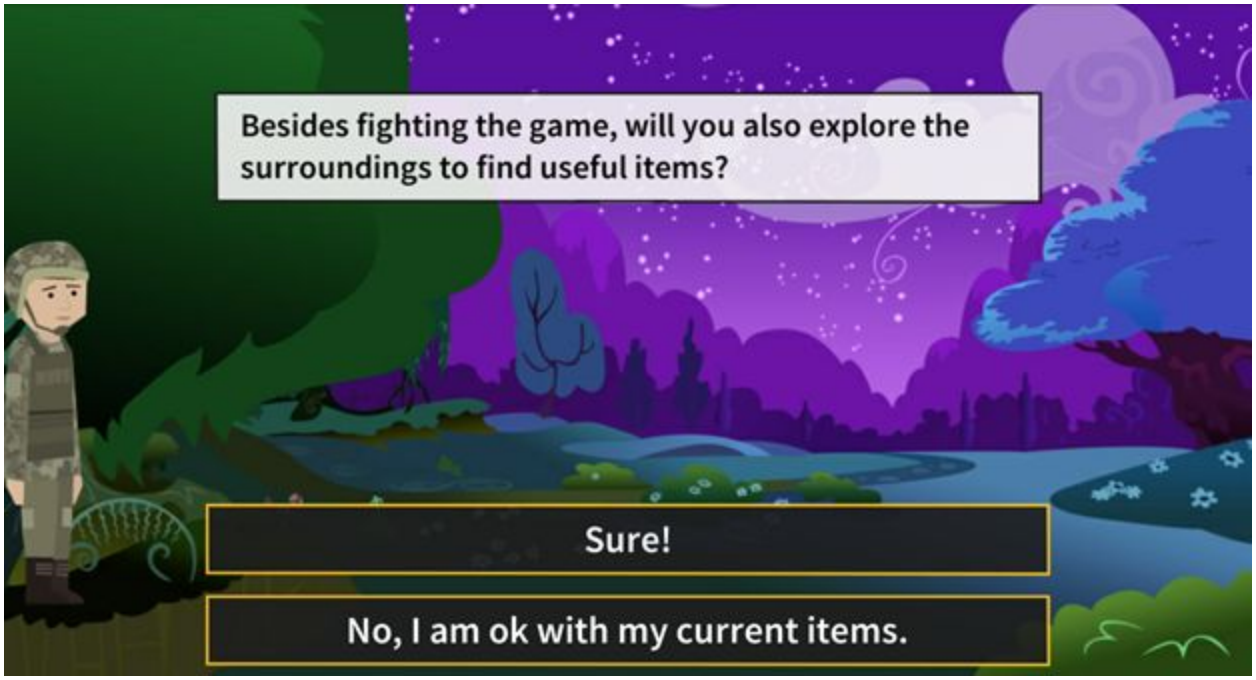
Tutorial and regular fights. The participants fight enemies and get dropped items in a scripted way. At this point participants are divided into two groups. Participants in one of the groups are assigned high valued items most of the time after they defeat a boss. The opposite for the other group.

Boss fight. The participants who get useful items before will win the boss in a scripted way. The other participants who get valueless items before will lose the fight. This is to intensify the understanding of the participants of the values of the items they got before.

Exploration of the map. Here the participants are asked the first question that concerns a dependent variable, as is shown in Graph 1. This question asks if player will explore the map for valuable items, which is a measurement of the degree the player wants valuable items.

Raid-boss fight. The participants will fight a raid-boss on an online match in a scripted way. The participant's team will win the match and the participant will be asked the other two questions regarding the dependent variables: Whether or not pick up the items from the enemy shot down by other players, or give away the item from the enemy shot down by the player (Shown in Graph 2 and 3). These are also the measurement of the degree of players want valuable items.

Debrief. Where participants learn the purpose of the research and the general idea of how this research is conducted. They are also told the independent variable of the game, which is the value of the items they get.



Graph 1 Dependent variable - searching the map for valuable items

Graph 2 Dependent variable - picking up item deserved by other players

Graph 3 Dependent variable - giving away items

Results

First, the mean, median, mode, variance and standard deviation of derivative Dependent Variable (DV) were calculated, as shown in Table 3. This DV is the most important to our results, since it concludes the other 3 independent variables.

In Table 3, "High Group" refers to the group of participants who get valuable items. "Low Group" refers to the group of participants who get valueless items.

Table 3
Result in terms of the Dependent Variable "Degree of Wanting Items"

DV degree of wanting items	High Group	Low Group
Mean	1.818182	2
Median	2	2
Mode	2	2
Standard Deviation	0.9816498	0.9258201
Variance	0.9636364	0.8571429

The mean, medians and mode of both groups are around 2. In the design of this research, a *degree of wanting items* of 1 is considered "normal". Being higher than 1 is considered "wanting more items" and being lower than 1 "not wanting more items". The box-plot is shown in Figure 1.

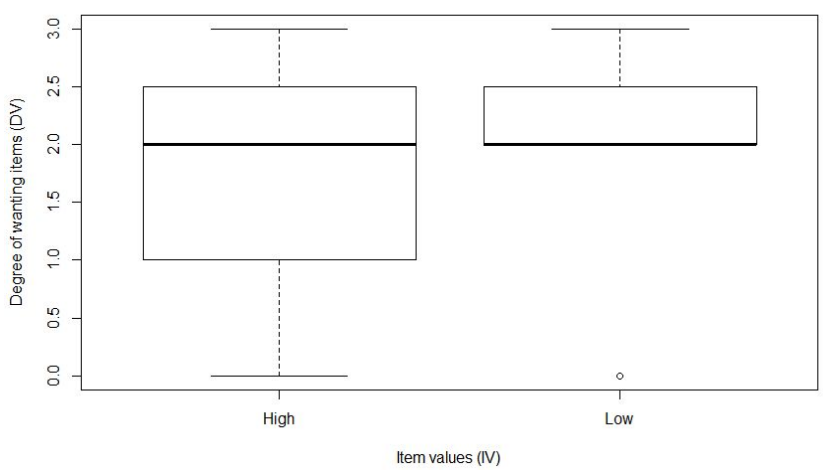


Figure 1 Box-plot of the "High Group" and "Low Group"

In addition to this, a t-test was run on comparing these two groups. Giving the facts that 1) the sample is random (participants are randomly chosen) 2) Values are independent between two groups 3) Sample is small enough 4) Variances are "equal" because the larger one (the "High Group" is no more than twice the "Low Group"), a t-test was viable and meaningful.

The hypothesis in the t-test was *Hypothesis Low:* "The *Low Group* has a higher value of *degree of wanting items*". The result was the p value = 0.3429. Since the *significance level(α)* was assumed to be 0.05, which means p value was greater than *α, the Null Hypothesis* was NOT rejected. Likewise, for the *Hypothesis High*, the p value = 0.6571, which also failed to reject the null hypothesis. This meant the two groups have no obvious difference in terms of the degree of wanting items.

For the other 3 dependent variables, t-tests values were run individually. And the p-values for them were shown in the table below (*High Hypothesis*), as shown in Table 4:

Table 4
P-values for the other 3 dependent variables

Variable name	p-value
Searching the map for valuable items	0.3717
picking up item deserved by other players	0.5187
giving away items	0.879

Since we can see they are all <0.95 or >0.05(α value), null hypothesis cannot be rejected.

Discussion

From the Figure 1, we can see little difference between the two groups. This means the *Null Hypothesis* is supported. Also, the t-test run on each of the 4 variables supported the *Null Hypothesis*. Thus, the result of this research shows there is no obvious relationship between how valuable items one has versus how much one would want more valuable items.

Another result worth noticing is the *degree of wanting items* of both groups show a tendency of "wanting items". This adds on to our *Null Hypothesis* to mean that not only there is no difference between two groups, but also, they both want valuable items.

This result hence supported the "Greedy theory" discussed before in the background section, which backs up the theory that "People want more however much they currently have". And this can be used to explain "Pay-to-win" game mechanics (Thier, 2017) and other rewarding systems in role-play games. Also, this result can be applied to areas other than games. "No matter how much I currently have I still want more" is rather a psychology observation.

There are some restrictions for this research result as well. First, this research focused on Role-Playing Games which usually have elaborate item systems. But there are also other games feature powerups and items of different values. Second, this research did not differentiate the "price value" (the price in in-game currency or real currency of an item), "stat value" (the stats of an item) and the "power value" (the estimation of the usefulness and power of an item) (Hsiao & Chen, 2016). In this research the "value" we referred to is implicitly the "power value", but the "power value" is relatively vague and there are subtle differences between these 3 variables. Third, the participant pool can be larger so that the result can have more significant meanings.

Conclusion

The value of the items/power-ups players get in role-playing games doesn't affect decision making of getting more items. This result can also be applied to research areas other than games. Further detailed research on what kind of item values mostly affects the decision of getting valuable items and on a larger participant pool might be able to determine a more precise conclusion.

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