Applying the Two-Factor-Theory to the PLAY Heuristics

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ABSTRACT

It is a common practice to use heuristic evaluations to assess usability and user experience of digital systems. Video games are no exception. Several video game researchers have presented different lists of best practice, design patterns, principles and heuristics over the last decade. The authors of this paper wanted to see if there is an aspect of priority that can be applied to an existing set of video game heuristics and if it is possible to classify the heuristics according to type. This study uses a survey where the participants were asked to classify Desurvire and Wiberg's (2009) PLAY heuristics according to Herzberg's theory into either Hygiene Factors or Motivators. The participants were instructed to view Hygiene Factors as essential to ensure functionality for an enjoyable play experience, while Motivators are mostly aimed at polishing the experience. The method used in this study is inspired by a previous work, where web design heuristics were classified in a similar manner. Results show that the method is applicable, and that it yields interesting results. Preliminary results indicate that mainly heuristics that consider usability are perceived as Hygiene Factors while the heuristics classified as Motivators consider other topics, such as storyline and immersion. Interestingly, the PLAY heuristics are evenly split between these two categories.

Keywords

Heuristic evaluation, Two-factor theory, video games, human computer interaction, Game Design, Evaluation methods

INTRODUCTION

Heuristic evaluations are a well established assessment method in the field of Human Computer Interaction (HCI), usability, and interface design (Isbister & Shaffer, 2008). In

recent years efforts have been dedicated to exploring video game assessment with a heuristics approach. Several researchers (Desurvire & Wiberg , 2009; Desurvire, Caplan, & Toth, 2004; Björk & Holopainen, 2004; Pinelle, Wong, & Stach, 2008) have published lists of patterns and criteria specifically targeting design and design issues in video games. One of the more recent heuristic lists is the game industry-recognized PLAY list by Desurvire and Wiberg. Heuristic evaluations are a quick and easy way to discover common mistakes in the design.

In a recent study (Strååt et al. 2015) we conducted heuristic evaluations on games of either high or low quality - as defined by the Metacritic.com point system. We found that usability design issues could often be found and were more prevalent in low rated games. Another recent study (Strååt & Verhagen, 2014) showed that users express more opinions about game aesthetics, narrative or storyline than they do on usability issues. The results from study I and study II raised the idea that some heuristics may be more important to adhere to than others. In this study we present a way to divide a known set of heuristics. We conducted a survey based on a set of video game heuristics – the PLAY heuristics - where we ask the respondents to define which heuristics are necessary in order to even be able to play the game and what heuristics that can be considered for reinforcing the game's entertainment value . As a theoretical approach we used the Hygiene – Motivator theory (Herzberg). We categorize the principles of the PLAY list into Hygiene Factors and Motivators, in order to find out which heuristics relate to essential functionality, and which have to do with motivation. In this way, we can indicate which heuristics a game designer should prioritize when designing a new game.

A major inspiration for this study was Zhang and Von Dran's (Zhang & Von Dran, 2000) study on web design heuristics. By using Herzberg's Two-Factor Theory, they found that existing web design heuristics would fall into one of two distinct categories; a two-factor model that distinguishes between factors that ensure essential functionality - *Hygiene Factors* - and factors that create motivation to keep exploring a webpage - *Motivators*. One purpose of the article was to suggest to web designers which design principles they should prioritize. Our study explores whether the PLAY list can be categorized in a similar manner.

BACKGROUND

Human Computer Interaction, Usability and Video Games

HCI involves several fields of research, including computer science, behavioral and cognitive science, and design. The purpose of HCI is to improve interactions between the user and the computer interface, minimizing issues with usability. ISO 9241-11 (ISO/IEC, 1998) defines usability as *"The effectiveness, efficiency and satisfaction with which specified users achieve specified goals in particular environments"*. Many of the existing design principles and heuristics address usability of productivity systems. Video games however do not share all the attributes of productivity software; an intriguing challenge in the former may be a source of frustration in the latter. Part of the entertainment in playing video games is that they are challenging and immersive (Koster, 2005)**.** The challenge, however, should be in the story, mood and gameplay, and not in the interaction with the game. The game interface could be seen as an interaction instrument designed to make the game possible to play (Juul, 2010). Laitinen (2006) describes the importance of evaluating the game usability of the interface as well as the actual gameplay; while a poor user interface may ruin a game experience, a perfect

interface may not be able to save poor gameplay. Shortcomings in the game interface can be refuted using the same usability rules as one would use when assessing productivity software, while shortcomings in the game challenges should be refuted using video game specific usability rules, such as the PLAY heuristics.

The PLAY Heuristics

Heather Desurvire and Charlotte Wiberg created the PLAY Heuristics (Desurvire & Wiberg, 2009), or Principles of Game Playability, progressively over a number of studies and with the support of input and evaluation from video game producers and designers. The purpose of the PLAY list is to assist video game developers throughout the design process but with a strong focus on the early stages. According to Desurvire and Wiberg (ibid), it has been well received, and is regularly used in the video game design industry.

The list contains 48 game design principles, which should be considered according to the game genre the evaluator is working with; if the game contains no player avatar, heuristics that consider avatars should be omitted by the evaluator.

It should also be pointed out that some heuristics in the PLAY list are very similar to eachother, sometimes only reworded and with few differing nuances. Regardless of this fact, we decided to put forth the list in its entirety. The purpose of our study was not to evaluate the PLAY list, or re-create it in any way. It was selected for this study due to its thorough development cycle and popularity in the video game industry.

The PLAY list is presented in Table 1. It is presented out of its original order, but no alterations have been made to the actual content.

The original PLAY list is divided into three main categories:

1. Game Play

2. Emotional Immersion

3. Usability and Game Mechanics

Each category is divided into subsections. In category *1. Game Play* the first subsection is *A. Heuristic: Enduring Play* and the actual heuristics are labeled A1, A2 etc. For the purpose of this study, and reasons of space, we have re-labeled the heuristics as follows: 1-A1 refers to Category 1, subsection A, heuristic 1.

Herzberg's Theory

Herzberg's Two-Factor Theory (Herzberg, 1966) was originally developed from a study on the relationship between job attitude, performance and productivity in the workplace. The study was conducted in the late 1950s and is based on interviews with 203 engineers and accountants in Pittsburgh, PA, USA. The basic premises of Herzberg's Two-Factor Theory are two separate sets of properties that affect job attitude and satisfaction: *Motivators* and *Hygiene Factors*:

- Hygiene Factors are extrinsic to the work itself, and essential in preventing job dissatisfaction.

- Motivators are intrinsic incentives that create job satisfaction and may as such improve performance.

Herzberg found that Hygiene Factors and Motivators act independently of each other. A working environment where Hygiene Factors are poorly applied or absent is conducive to a negative job attitude. Removal of dissatisfaction, however, does not automatically give satisfaction. Satisfaction has to be instilled with Motivators. In a workplace, Hygiene Factors do not contribute to a positive job attitude. They provide the ``bare minimum'', needed to prevent dissatisfaction. Vice versa; even when Motivators are present, unresolved hygiene needs may cause dissatisfaction.

Zhang and von Dran's Satisfiers and Dissatisfiers

Zhang and von Dran studied web design (Zhang & Von Dran, 2000). They wanted to see if it was possible to divide web design heuristics into Satisfiers and Dissatisfiers, according to Herzberg's Two-Factor Theory. They found that the division was possible, and also helpful in visualizing which heuristics were essential for a fully functional web site. Their study was divided in two phases: the first phase, in which web design features and categories were identified, and the second phase in which Hygiene Factors and Motivators were identified. Our study uses a similar method, strongly inspired from Zhang and von Dran. We did not need to identify design features of video game design, since this has already been addressed by Desurvire and Wiberg (2009).

METHOD

In this study we used a multiple choice survey to identify player opinions on which of the PLAY heuristics can be considered to be a Motivator or a Hygiene Factor.

Survey Design

We used the PLAY list to compile a digital questionnaire, in which the respondents were asked to determine whether a heuristic value is a Motivator or a Hygiene Factor. As opt out alternatives we included *Unable to understand the text* and *Unable to determine whether this is a Hygiene Factor or a Motivator* in the same way as Zhang and von Dran (Zhang & Von Dran, 2000) did in their study.

Each heuristic was presented verbatim from the PLAY list, followed by four radio button alternatives:
- Motivator
- Hygiene Factor
- Unable to understand the text
- Unable to determine whether this is a Hygiene Factor or a Motivator

The original PLAY list is organized into categories, sub categories and labels, but we decided to present it without these identifiers as this information is superfluous in the context of our survey. Our requisites for the respondent group were that they played video games, and that they could communicate well in English. We recruited respondents that fitted the requisites among students at our university.

Survey

All respondents were seated at individual computer workstations. We started by showing an eight minute long video presentation describing the basic premises for the study, the concept of Two-Factor Theory and heuristics, examples of how to classify and

instructions on the questionnaire. The video presentation was designed by us, and narrated in the students' native language in both text and voice over. The respondents were informed that their replies were anonymous, that they were under no obligation to complete the questionnaire and were free to leave at any time. The PLAY list (Desurvire & Wiberg, 2009) was not introduced or explained in any way in the instruction video. The presentation was given in video format in order to ensure that all respondents would get identical information. After the video presentation, the respondents were requested to fill in questionnaire.

We conducted three sessions with a total of 23 respondents. Including instructions and the eight minute video, a session lasted approximately 30 minutes. Mean respondent age was 26 (SD 9, range 23 years). Mean years playing video games were 17 (SD 5.4, range 23 years). Mean hours played per week 14 (SD 11, range 39 hours) and 19 out of 23 spent more than 50% of their playtime on PC games rather than other platforms.

Analysis Method
For each heuristic, we calculated the difference in respondent frequency between hygiene and motivator responses. We subtracted the percentage of respondents who replied that the heuristic was a hygiene factor from the percentage of respondents who replied that the heuristic was a motivator factor, thus finding the difference between the different positions. This can be summarized using the following formula: Difference = (Percentage Motivator) - (Percentage Hygiene). For example, heuristic A-1A was found to be a hygiene factor by 61% of the respondents, and a motivator by 35% of the respondents. Hence, the difference is 35-61= -26%.

RESULT AND ANALYSIS
The graph (Figure 1) is sorted from highest value to lowest, to enhance visibility of the results. Negative values in the graph (see Figure 1) represent that the heuristic is predominantly considered a Hygiene Factor and positive values represent heuristics predominantly considered as Motivators. A negative value is not derogative; it indicates that the heuristic was classified as a Hygiene Heuristic.

We consider a strong indication of what type the heuristic is to be if the heuristic was classified as a certain type by twice as many as classified it as the other type. Hence, if heuristic A-1A was classified as a Hygiene Heuristic by at least 67% of the respondents, and a Motivator by no more than 33% of the respondents, we would consider it to be a Hygiene Heuristic. Conversely, a heuristic where the classification as Motivator is similarly dominant, we would classify it as strongly being a Motivator. Medium indications are calculated the same way, but with a threshold of 50%, and weak indications are calculated at 34%.

Opt-out Alternatives
Opt-out alternatives are not represented in the graph. There was a low frequency of both Unable to understand the text and Unable to determine whether this is a Hygiene Factor or a Motivator. It should be noted that the opt-out alternatives occurred only infrequently, and thus did not impact the result of the study in any meaningful way.

Hygiene Heuristics
Out of the 47 heuristics, 22 were classified as Hygiene Heuristics. 9 could be sorted into the strong, medium or weak categories.

Strong Hygiene Heuristic
Only one heuristic value was classified as a strong Hygiene Heuristic.

1-F1   *"Players feel in control"*

Medium Hygiene Heuristics
Three heuristics were classified as medium Hygiene Heuristics.

3-B3   *"Controls are intuitive, and mapped in a natural way; they are customizable and default to industry standard settings"*

3-F2   *"The player experiences the user interface as consistent (in controller, color, typographic, dialogue and user interface design)"*

3-B2   *"Status score Indicators are seamless, obvious, available and do not interfere with game play"*

Weak Hygiene Heuristics
Five heuristics were classified as weak Hygiene Heuristics

1-D1   *The game goals are clear*

3-A1   *Player does not need to read the manual or documentation to play*

3-B1   *Game controls are consistent within the game and follow standard conventions*

3-C2   *Provide appropriate audio/visual/visceral feedback (music, sound effects, controller vibration)*

1-B5   *AI is balanced with the players' play*

Motivator Heuristics
24 of 47 heuristics were classified as Motivator Heuristics. 11 could be sorted into the strong, medium or weak categories.

Strong Motivator Heuristics
1-C2   *Changes the player make in the game world are persistent and noticeable if they back-track to where they have been before*

2-A1   *There is an emotional connection between the player and the game world as well as with their "avatar"*

Medium Motivator Heuristics

1-B3   *Easy to learn, harder to master*

1-D3   *The game gives rewards that immerse the player*

3-F3   *The players experience the user interface/HUD as a part of the game*

3-D3   *The game gives rewards that immerse the player more deeply in the game by increasing their capabilities, capacity or, for example, expanding their ability to customize*

1-C1   *The game world reacts to the player and remembers their passage through it*

1-E2   *The game is balanced with multiple ways to win*

Weak Motivator Heuristics

1-B6   *The AI is tough enough that the players have to try different tactics against it*

2-B1   *The game offers something different in terms of attracting and retaining the players' interest*

2-C1   *The game uses humor well*

Opt-out Alternatives

Out of the 47 heuristics in the survey, 35 received either *Unsure* or *Unable to decide…* replies, none of these 35 had an opt-out rate exceeding of 13%. Heuristic 3-H1: *Player error is avoided* is the only one with high numbers in both opt-out alternatives, 9% on each alternative respectively. This might be an indication that this particular heuristic is hard to interpret, but the relatively low overall frequency indicates that this is not a large issue

Equal Values

Three heuristics were classified equally as Hygiene Factors and Motivators. 1-E3, 3-A2, and 3-B4 (see Figure 1 and Table 1). This might indicate that these two heuristics are unclear, or that our respondents found them ambiguous. All the equally classified heuristics should be given extra attention in a future study.
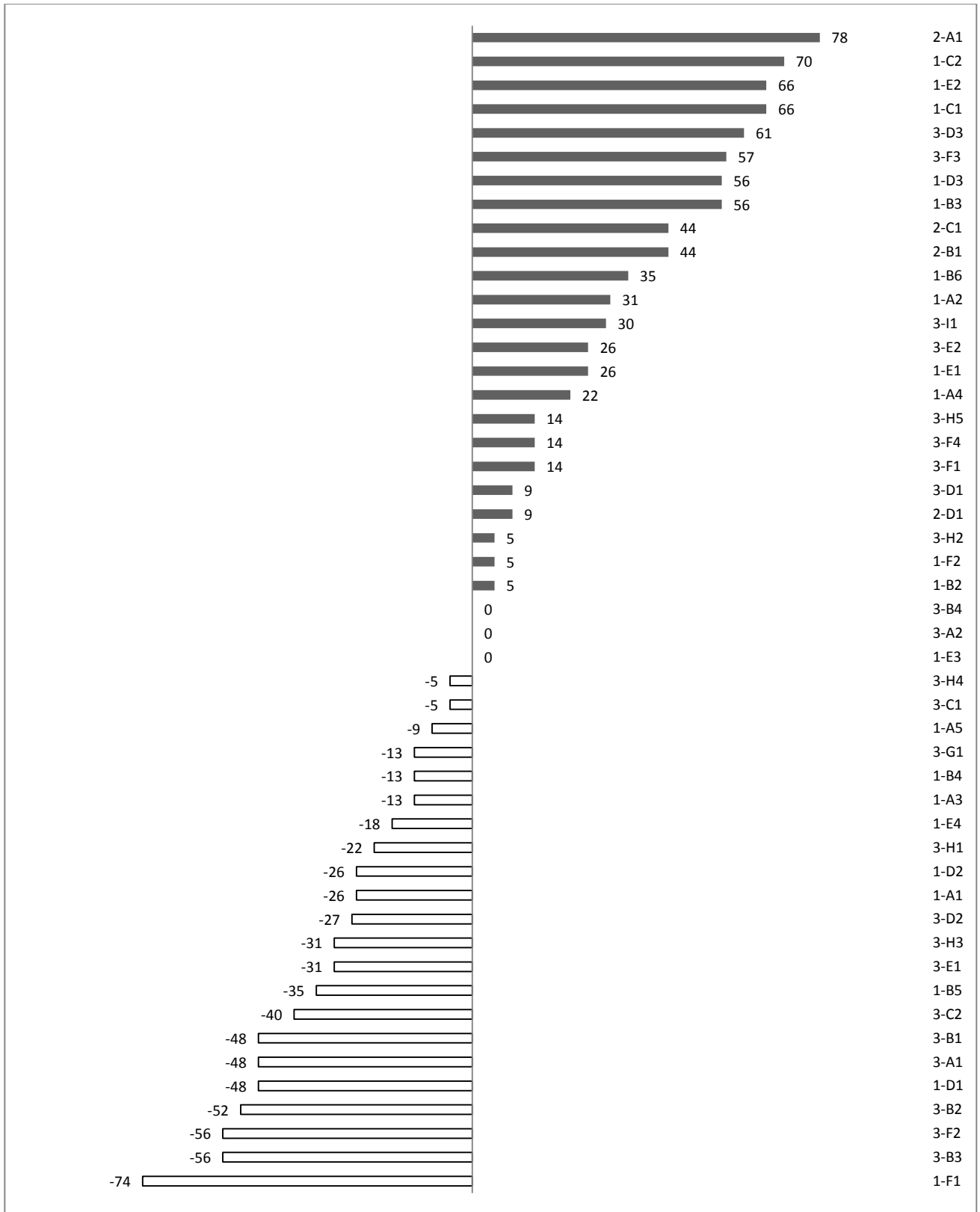
Figure 1: PLAY Heuristics ordered from strongest Motivator Heuristic at the top to the strongest Hygiene Heuristic at the bottom.

Label	PLAY Heuristic	Value
2-A1	There is an emotional connection between the player and the game world as well as with their "avatar"	78
1-C2	Changes the player make in the game world are persistent and noticeable if they back-track to where they have been before	70
1-C1	The game world reacts to the player and remembers their passage through it	66
1-E2	The game is balanced with multiple ways to win	66
3-D3	The game gives rewards that immerse the player more deeply in the game by increasing their capabilities, capacity or, for example, expanding their ability to customize	61
3-F3	The players experience the user interface/HUD as a part of the game	57
1-B3	Easy to learn, harder to master	56
1-D3	The game gives rewards that immerse the player	56
2-B1	The game offers something different in terms of attracting and retaining the players' interest	44
2-C1	The game uses humor well	44
1-B6	The AI is tough enough that the players have to try different tactics against it	35
1-A2	The players should not experience being penalized	31
3-I1	Game story encourages immersion (If game has story component)	30
1-E1	The game supports a variety of game styles	26
3-E2	Player is given controls that are basic enough to learn quickly, yet expandable for advanced options for advanced players	26
1-A4	Gameplay is long and enduring and keeps the players' interest	22
3-F1	Screen layout is efficient, integrated, and visually pleasing	14
3-F4	Art is recognizable to the player and speaks to its function	14
3-H5	All levels of players are able to play and get involved quickly and easily with tutorials, and/or progressive or adjustable difficulty levels	14
2-D1	The game utilizes visceral, audio and visual content to further the players' immersion in the game	9
3-D1	The game goals are clear. The game provides clear goals, presents overriding goals early as well as short term goals throughout game play	9
1-B2	The game is paced to apply pressure without frustrating the players	5
1-F2	The players have a sense of control and influence onto the game world	5
3-H2	Player interruption is supported, so that players can easily turn the game on and off and be able to save the games in different states	5
1-E3	The first ten minutes of play and player actions are painfully obvious and should result in immediate and positive feedback for all types of players	0
3-A2	Player does not need to access the tutorial in order to play	0
3-B4	Consistency shortens the learning curve by following the trends set by the gaming industry to meet users' expectations. If no industry standard exists, perform usability/playability research to ascertain the best mapping for the majority of intended players	0
3-C1	Game provides feedback and reacts in a consistent, immediate, challenging and exciting way to the players' actions	-5
3-H4	Players should be given context sensitive help while playing so that they are not stuck and need to rely on a manual for help	-5
1-A5	Any fatigue or boredom was minimized by varying activities and pacing during the game play	-9
1-A3	The players should not lose any hard won possessions	-13
1-B4	Challenges are positive game experiences	-13
3-G1	Navigation is consistent, logical and minimalist	-13
1-E4	The game had different AI settings so that it was challenging to all levels of players, whether novice or expert players	-18
3-H1	Player error is avoided	-22
1-A1	Player finds the game fun	-26
1-D2	The skills needed to attain goals are taught early enough to play or use later, or right before the new skill is needed	-26
3-D2	The skills needed to attain goals are taught early enough to play or use later, or right before the new skill is needed	-27
3-E1	The game does not put an unnecessary burden on the player	-31
3-H3	Upon turning on the game, the player has enough information to begin play	-31
1-B5	AI is balanced with the players' play	-35
3-C2	Provide appropriate audio/visual/visceral feedback (music, sound effects, controller vibration)	-40
1-D1	The game goals are clear	-48
3-A1	Player does not need to read the manual or documentation to play	-48

3-B1	Game controls are consistent within the game and follow standard conventions	-48
3-B2	Status score Indicators are seamless, obvious, available and do not interfere with game play	-52
3-B3	Controls are intuitive, and mapped in a natural way; they are customizable and default to industry standard settings	-56
3-F2	The player experiences the user interface as consistent (in controller, color, typographic, dialogue and user interface design)	-56
1-F1	Players feel in control	-74

Table 1: The PLAY Heuristic list shown with the values from the survey. Negative values are classified as Hygiene Heuristics and positive values are Motivation Heuristics. A higher value means a higher rate of classification.

Conclusion and Discussion

The purpose of this study was to examine whether a Two-Factor Theory classification of video game heuristics is possible. Our results show not only that it is possible, but also that there is a division of purpose in the heuristics. Herzberg describes Hygiene Factors as extrinsic properties and Motivators as intrinsic properties. If we transfer this reasoning onto video game design, we could view the actual gameplay, storyline and immersion - things that are part of the actual game experience - as the intrinsic properties of a video game. The extrinsic properties would be things, such as an interface, that players have to deal with in order to attain the intrinsic experience. Herzberg's Two-Factor Theory claims that unresolved Hygiene issues will prevail even in the presence of enhanced Motivators, e.g. it is rarely possible to compensate for usability issues with a stronger storyline: if the player cannot interact with the game, she cannot experience the story.

A well designed video game interface allows the player to interact with the game without friction, while a well designed gameplay should induce a positive and satisfying game experience. Our Hygiene and Motivator classification of the PLAY Heuristics show that this perspective is viable. This reasoning is supported by the fact that a clear majority of the respondents of our survey considered heuristics that concern usability to be Hygiene Factors. Heuristics that concern "softer" values were classified as Motivators by a majority of our respondents.

Our findings also correlate well with Zhang and von Dran's (2000) classification of web design heuristics; heuristics that ensure essential web functionality are classified as Hygiene Factors. The Hygiene classified heuristics from the PLAY list are clearly related to essential video game functionality; the respondents classified most of the PLAY heuristics of category 3 – Usability and Game mechanics as hygiene factors. On the Motivator side, heuristics concerning emotional connection and immersive aspects were ranked highest. This correlates well with our findings in study II (forthcoming, omitted); players consider game aesthetics, narrative and immersion to be important.

We believe that the approach in this paper provides an intuitive solution for rapid software development by easily communicating the guidance to the development team members. This study shows that there is a value in deciding which order to evaluate a game prototype. If the Hygiene Heuristics aren't seen to, there is little point in investing in the Motivator Heuristics. We also believe that the classification adds a dimension of priority to video game heuristics, as

- it demonstrates that there are two sets of game properties that act independently of and without influence on of each other.

- it demonstrates issues that cannot be cancelled by an avid attention to aspects/heuristics from the other set.

- it demonstrates that usability issues are Hygiene Factors, and as such highly likely to cause dissatisfaction if not properly attended to.

It should be noted that the PLAY heuristics (Desurvire & Wiberg, 2009) were primarily intended as design tools for game developers. Therefore, using respondents from a different demographic group could be considered problematic. Our respondent group, however, are all fairly experienced gamers, with between 5-26 years of gaming experience. Furthermore, studying the end users gathers data on what players consider important, rather than what is considered by developers. Furthermore, the demographics used for this study might be considered slightly problematic. The respondent group was largely self-selected overall native Swedish young adults (most being in their 20's) and all of them had at least some university level education. Despite these shortcomings the responses were still fairly diverse. Nevertheless, further studies should attempt to achieve a considerably more diverse respondent group.

Future Research

As mentioned in above, future studies should attempt to gather data from a more diverse group of respondents. For ethical as well as practical reasons, the problems with self-selection might be hard to alleviate. Future studies should attempt to reach a more diverse group of respondents.

For future research, we see three additional avenues to explore using different methodologies. First, the heuristics that were not found to be clearly Hygiene Heuristics or Motivator Heuristic factors (primarily 1-E3, 3-A2, and 3-B4, see Table 1) should be examined further. Although the even, or near-even, split between many of the heuristics may be a product of the homogeneous respondent group, it may also be a symptom of problems with the heuristics themselves. Because of this uncertainty, further study is warranted.

Second, many of the heuristics classified as Hygiene Heuristics by the respondents tend towards features related to game mechanics instead of "softer" values such as narrative. This is an interesting result, and could potentially shed light on what factors players consider to be basic features that are needed for a game. Future studies should explore player opinions and if there is a correlation between poor gameplay and lack of appreciation of the game narrative.

Third, a possible new avenue to pursue using this method would be to explore if the issues identified by quality assurance (QA) staff at game development companies can be classified as Hygiene Factors or Motivators. In essence, the differentiation between Hygiene and Motivator could be used in addition to the usual severity rating usually attached to a bug, potentially helping developers prioritize the issues identified by QA. In order to make the results more palatable for the gaming industry, some terminology should probably be made less "academic". For example, the terms "Hygiene Factor" and "Motivator" should perhaps be called something more intuitive to those not fully familiar with Herzberg's work. Our suggested names for these are "must have" for Hygiene Factors, and "nice to have" for Motivators. Although this may cloud the issue for academics, it could arguably cut down on training time for game development staff.

BIBLIOGRAPHY

Björk, S., & Holopainen, J. (2004). *Patterns in Game Design (Game Development Series.* Charles River Media.

Desurvire, H., & Wiberg, C. (2009). *Online Communities and Social Computing.* Springer Berlin Heidelberg.

Desurvire, H., Caplan, M., & Toth, J. A. (2004). Using heuristics to evaluate the playability of games. In *CHI'04 extended abstracts on Human factors in computing system* (pp. 1509-1512). ACM.

Herzberg, F. (1966). *Work and the nature of man.* World Publishing Company.

Isbister, K., & Shaffer, N. (2008). *Game Usability: Advancing the Player Experience.* CRC Press.

ISO/IEC. (1998). *Ergonomic requirements for office work with visual display terminals (vdt)s - part 11 guidance on usability.* Tech. Rep. ISO/IEC 9241-11: 1998 (E).

Juul, J. (2010). *A Casual Revolution: reinventing video games and their players.* MIT Press.

Koster, R. (2005). *A Theory of Fun for Game Design.* Paraglyph Press, Inc.

Laitinen, S. (2006). Do usability expert evaluation and test provide novel and useful data for game development. *Journal of usability studies , 2* (1), 64-75.

Pinelle, D., Wong, N., & Stach, T. (2008). Heuristic Evaluation for Games: Usability Principles for Video Game Design. *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2008).*

Strååt, B., Johansson, M., & Rutz, F. (2015). Does Game Quality Reflect Heuristic Evaluation? – Heuristic Evaluation of Games in Different Quality Strata. *International Journal of Gaming and Computer-Mediated Simulations (IJGCMS).*

Strååt, B., & Verhagen, H. (2014). VOX POPULI - A Case Study of User Comments on Contemporary Video Games in Relation to Video Game Heuristics? United Kingdoms: GAMEON Eurosis.

Zhang, P., & Von Dran, G. M. (2000). Satisfiers and dissatisfiers: A two-factor model for website design and evaluation. *Journal of the American society for information science, 51(14)* , 1253-1268.