# Analysis How Piggybacking Assists Players To Understand New Outlandish Mechanics: A Case Study

Julius Sellgren
Södertörn's University
sellgren_julius@hotmail.com

## CCS Concepts

- Human-centered computing~Human computer interaction (HCI)~Interaction paradigms

## Keywords

Familiarity, Pre-existing knowledge, Piggybacking, Flow

## 1. INTRODUCTION

Game design is a multidisciplinary field encompassing various aspects, from mechanics and aesthetics to player engagement and storytelling.

This paper uses the DDE framework to analyze a case presented in the GDC talk titled "Magic: the Gathering: Twenty Years, Twenty Lessons Learned." The primary objective is to gain insights into how this framework can enhance the game design process for designers. Furthermore, the paper aims to discuss the significance of incorporating piggybacking, also referred to as familiarity, in game design.

The paper consists of the following components: a comprehensive literature review encompassing topics such as the DDE framework, flow theory, and principles related to familiarity; a case study elucidating how Mark Rosewater (2016) acquired the lesson of incorporating piggybacking and flow concepts in game design; the application of the DDE framework; and an exploration of the insights derived from using the DDE framework and integrating piggybacking principles.

## 2. LITERATURE REVIEW

### 2.1 The DDE Framework

The MDA framework, introduced by Dormans and Holopainen in 2017, is an acronym representing Mechanics, Dynamics, and Aesthetics. It is a comprehensive approach to understanding games by dissecting them into these three fundamental layers. Mechanics define the game's rules and actions, dynamics involve randomness and complexity within the game's behavior, and aesthetics focus on delivering an emotional experience to players (Dormans and Holopainen, 2017). The professional game design community utilizes the MDA framework at a certain capacity, but some problematic aspects of the framework hinder it from being used even more (Walk, Görlich, and Barrett, 2017).

Walk, Görlich, and Barrett (2017) reframed the MDA framework into the Design, Dynamics, and Experience (DDE) framework, offering a new perspective. They pointed out some conflicts within the original MDA framework, particularly the distinction between aesthetics and data representation. They also criticized the broad scope of the Mechanics component, which extended beyond rules to include design elements like materials, recipes, and ingredients. In response to these issues, Walk, Görlich, and Barrett (2017) proposed the DDE framework, considering the production process of games and addressing the overarching question: "Why do game stories often fall short?"

The MDA framework's three core components correspond to a game's rules, system, and enjoyment (Dormans and Holopainen, 2017). Lankoski further explains that the MDA framework underscores the disparity between how consumers and designers perceive games. Consumers prioritize aesthetics, while designers typically begin with mechanics and build aesthetics and dynamics upon them. Lankoski (2018) emphasizes that the MDA framework is valuable in iterative design processes, helping designers assess how alterations in each layer can impact the game.

The MDA framework distinguishes three key layers in game design: mechanics, dynamics, and aesthetics. Mechanics dictate actions and influence gameplay, while dynamics manage randomness and complexity in a game's behavior. The aesthetics layer concentrates on the player's emotional experience, targeting eight fun types: sensation, fantasy, narrative, challenge, fellowship, discovery, expression, and submission. Nonetheless, despite its influence, the MDA framework faces criticism for unclear distinctions between mechanics and dynamics, the omission of visuals and story in the aesthetics layer, and limitations in the eight types of fun. These concerns have led to the development of alternative frameworks, such as the Design, Dynamics, and Experience (DDE) framework, which addresses some of the issues raised by Dormans and Holopainen (2017).

Frameworks such as MDA and DDE underscore the disparity in perspectives between game designers and players. Game designers typically initiate the game creation process by establishing mechanics as the foundation, subsequently layering dynamics and aesthetics on top. In contrast, players initially engage with a game through aesthetics and then delve into the dynamics and mechanics (Dormans & Holopainen, 2017).

#### *2.1.1 The Components of the DDE Framework*

The DDE framework's first component is Design, which has three subcategories: Blueprint, Mechanics, and Interface. Blueprint encompasses the conceptual elements of a game, such as its world, cultures, religions, and art styles. It also includes elements like narrative, character design, and sound Design. This part of the design process concerns planning and documentation (Walk, Görlich, and Barrett, 2017).

Mechanics is the second component of DDE, and it refers to the technical aspects of the game, including code architecture, input/output handling, and object interactions. These elements are behind the scenes that players do not directly see but are crucial for the game to function (Walk, Görlich, and Barrett, 2017).

Interface is the last subcategory of Design, which involves the concrete Design and production of in-game elements that players interact with, including graphics, sounds, and feedback systems. It is everything players see and hear in the game (Walk, Görlich, and Barrett, 2017).

The dynamics category in the DDE framework is the same as in the MDA framework. Dynamics are the user interactions

provided; they describe how the mechanics manifest themselves during actual gameplay based on the player's actions.

Experience is the last component of the DDE framework, which refers to players' entire journey when interacting with a game. It encompasses everything from first learning about the game, considering purchasing it, installing it, and, most importantly, the emotional and cognitive responses and engagement players have during gameplay. The Experience component emphasizes creating a meaningful and immersive experience for players throughout their interaction with the game rather than focusing solely on its mechanics or aesthetics (Walk, Görlich, and Barrett, 2017).

## 2.2 Pre-existing knowledge

Pre-existing knowledge has famously been described as the most important determinant of learning success (Brod, 2021). Pre-existing knowledge and its influence on the capabilities of further learning have been studied thoroughly in academia (Brod, 2021). Brod (2021) argues that the effect of pre-existing knowledge and how it affects new knowledge acquisition is achieved by giving the subject hints to activate it properly. It is also important that the activator of pre-existing knowledge is activated and relevant. It has to be congruent with the to-be-learned concept to have an unequivocally beneficial effect. To activate pre-existing knowledge of the player and make it congruent could be achieved in game design. For example, in the design process of a zombie card in a card game, the name could be attached to a zombie, the card type could be zombie, and there could also be art that resembles a zombie to enable the player to easily activate pre-existing knowledge and thereby attach new and prior knowledge of zombies to that given card. If done properly, pre-existing knowledge can assist the subject in learning and remembering new information and concepts more easily.

## 2.3 The Law of Familiarity

By applying the Geralt Principles in the design process, the designer assists the user to more readily process visual stimuli they perceive (Knight, 2020). Using the Geralt Principles, the designer can lower the cognitive load on the user by providing visual information in an easily digestible format. The more complex a game or a system is, the more important it is for the designer to be aware and focus on lowering the cognitive load as much as possible. The law of familiarity is the relevant principle in the Geralt Principles to this case study. The law of familiarity, as explained by Knight (2020), is, for example, when we see a cloud in the sky and think it resembles something, could be an animal or anything else, the limit is the imagination of the human being. Designers can benefit from using the law of familiarity by using features in the design that are most likely familiar to the user base. The effect would be that the interaction can be more intuitive because the user already knows how it works (Ibid.)

## 2.4 Flow Theory

Csikszentmihalyi's (1990) Flow Theory has significantly influenced the design and enhancement of positive player experiences in games. This theory emphasizes the importance of clear objectives, balanced challenge and skill levels, immersion, player agency, progression markers, and a sense of timelessness in the gaming experience. By adhering to the principles of flow, game designers can create games that engage players by providing an engaging and immersive environment where they experience intense concentration and a sense of control. Achieving the sense of flow increases intrinsic motivation and satisfaction, ultimately fostering a more positive and fulfilling gaming experience. Understanding and applying flow theory to game design is essential to optimizing player engagement and enjoyment.

# 3. CASE

The case subject in this article is the GDC talk presented by Mark Rosewater (2016), the head designer of Magic The Gathering, where he shares twenty lessons learned over twenty years of designing the game. This analysis focuses on his fourth lesson, where he learned that piggybacking is essential, using pre-existing knowledge to front-load game information to make learning easier (Rosewater, 2016).

Rosewater (2016) explains that he learned his lesson of piggybacking when he created the set called Theors, a Greek mythology-inspired set. In the set, the design team designed several cards that were directly inspired by Greek mythology, but his example was the design process of the Akroan Horse. The inspiration for the card's effect came from the idea of a Trojan horse sending in a supposed gift to the enemy with a trap inside of it. The card was popular among the playtesters. They understood the concept and the value behind playing the card because they were familiar with the concept of a Trojan horse. The creative team changed the art and the card's name to playtest the difference. Instead of a horse, they made the art to display a lion, and the card was renamed the Akroan Lion. The playtesters complained about the card. The playtesters did not enjoy the card as they did not understand the value of playing it. They were confused because the concept of gaining value by giving a card to an opponent was not established. The lesson learned by Mark Rosewater (2016) was that if a concept behind a new kind of card effect requires further explanation, assisting the players with methods such as piggybacking will make them understand the concept faster.

# 4. ANALYSIS AND DISCUSSION

## 4.1 Application of the DDE Framework

In Mark Rosewaters's (2016) GDC talk, he discusses the design process of a card, which the first iteration of the design very confusing and off-putting to the players and the finalized card became very successful and easily understandable and familiar to the userbase. This paper will apply the DDE framework to analyze the player experience of the card's first iteration, called Akroan Lion, and the deployed iteration of the same card, renamed the Akroan Horse. Below is a breakdown of the two iterations of the card into Design, Dynamics, and Experience:

**Design** in the DDE framework effectively means everything that is directly designed by the designer and under no direct influence by the player (Walk, Görlich, and Barrett, 2017). In terms of **Design Mechanics**, there are no differences between the two iterations as they are mechanically identical. In the **Design Interface**, the differences are the art and the card name. Regarding **Design Blueprint,** the two iterations are identical and have the same art style. There was no discussion or comments regarding any difference in **Design Blueprint**.

In terms of **Dynamics**, the players understood how to play the Akroan Horse card as the text, the name, and the art were attached to the pop-culture figure of a Trojan horse. The playtesters understood the mechanics and the concepts behind the card as they were familiar with the concept of a Trojan Horse, which the mechanics of the card mimics. There was confusion in the Akroan Lion iteration as the playtesters did not understand what this card was doing and how it could benefit their goal of winning. The confusion hindered the players from entering the feeling of flow in the gameplay.

The concept of **Experience** in the DDE framework is important to delve into the cultural history of the player as the player-subject. The designer and the **Design** do not deal with the player directly but with the **Player-Subject**, a theory that it is not *us* who play games but a subset of ourselves (Walk, Görlich, and Barrett, 2017). in the GDC talk, Mark Rosewater (2017) discusses that players expressed enthusiasm over the iteration of Akroan Horse, which evoked a positive response among the players. On the other hand, the Akroan Lion iteration evoked confusion and uncertainty in how the card works. The players considered that the art and text of the Akroan Horse iteration were easier to understand as they were familiar with their relationship.

After breaking down the two iterations of the card into Design, Dynamics, and Experience, it is evident how the components affect each other. When analyzing the Akroan Lion iteration, the analysis deducts that the player experience is unfavorable because the **Design Interface** does not resonate well with the **Dynamics** of the card by the player. However, the Akroan Horse Design-Interface resonates well with the Dynamics, which creates a positive **Experience**. Using the DDE framework on the two iterations of the card presented by Mark Rosewater (2016) indicates a fundamental interaction between **Design Interface**, **Dynamics,** and the perceived **Experience** by the player. In this case, the card could be perceived as beneficial for the opponent if the player does not understand the effect accordingly, which the Akroan Horse iteration illustrates what the pop culture behind a trojan horse entitles. It was hard to understand that the card was not beneficial to their opponent when the card name and art were not explaining or assisting their comprehension of the card's value.

## 4.2 Piggybacking and Flow Theory

In the GDC talk, Mark Rosewater (2016) concluded that the Akroan Lion iteration failed because something needs to be familiar with the card. Meanwhile, the Akroan Horse resembles an established concept of a Trojan horse, which assists the players in guessing the value of playing the card. As derived by Knight (2020), the human brain works with perceptual biases to create meaningful, whole objects despite limited visual information, which works in tandem with Ware's (2008) concept of perception. The playtesters had no prior experience or memory with an Akroan Lion and, therefore, found it hard to map the new card effect with the hard-to-understand concept of gaining value to give a card to an opponent. The inability of the players to grasp the hard-to-understand concept interfered with the flow of the playtest session, which made the gameplay experience unfavorable. The Akroan Horse, however, consists of art that depicts a resemblance to a classic Trojan horse. Players who are familiar with the concept of a Trojan horse will have an easier time understanding the concept of the card and thereby predict the function of the card. The failure of the Akroan Lion could also have been because the players had different types of behavior attached to a Lion, which the card depicted. The behavior of a Lion could be from their belief that a living Lion would behave, from movies, or even how other cards depicted as Lions mechanically work in the game. Knight (2020) claims that people form representations of information that are familiar to them. In the analysis, it was observed that the playtesters had an excellent experience with the Akroan Horse iteration because they understood the concept of a trojan horse, that giving a gift with a trap inside gives value to them and not their opponent. The Trojan horse concept was familiar to them. The playtesters felt they knew how to correctly attach value to the card effect. The interaction between utilizing piggybacking in hard-to-understand concepts enriched the players' abilities to enter a feeling of flow in the gameplay, which positively impacted their experience with the gameplay.

Rosewater's (2016) lesson is that we should use piggybacking and its interaction with perceived flow when designing games. It could be used for various games to enhance player experience by making game concepts reduce cognitive load to understand game concepts. Also, the lesson is applicable in various games that aim to teach students various academic topics where students must enter flow by reaching the balance between difficulty and ease.

# 5. CONCLUSION

Utilizing the DDE framework as our guiding light, this article delves into the intricacies of game analysis. We journey through the dimensions of design, dynamics, and the player experience, unveiling their intricate dance and how they intricately weave into the tapestry of a player's encounter. As we embark on this voyage, it becomes evident, within the realm of the Akroan Horse design process, that a positive player experience hinges upon the symbiotic relationship between the design interface and dynamics, dictating a player's comprehension of the card's effects and its gameplay value.

However, on the flip side, our exploration of the Akroan Lion iteration spotlights the trials players encounter while deciphering the card's enigmatic effects. This journey demands additional clues and assistance for players to fathom its gameplay value and how its effect might confer a potential tactical edge. The Akroan Lion iteration proved to be a riddle too complex for playtesters to crack, plunging them into disrupted gameplay flow, ultimately degrading the overarching gaming experience.

This critical analysis underscores the significance of explaining vague or convoluted game concepts into more approachable and graspable forms for players. In doing so, we pave the way for their seamless immersion into a state of unbroken flow. In summation, applying the DDE framework in this study unfurls the merits of employing piggybacking to enhance game learnability without drowning players in complexity. Designers stand at the crossroads, challenged to strike a harmonious balance between challenge and accessibility, granting players the power to understand pivotal game elements swiftly. When players wield that confidence, it guides them toward a more prosperous and gratifying gaming journey.

# 6. REFERENCES


Brod, G., 2021. Toward an Understanding of When Prior Knowledge Helps or Hinders Learning. *Npj Science of Learning.* Vol 6(1), 1-3. DOI: 10.1038/s41539-021-00103-w

Csikszentmihalyi, M. 1990. *Flow: The Psychology of Optimal Experience*. New York: HarperCollins Publishers Inc.

Dormans, J. and Holopainen, J., 2017. Investigating game design methods and models. In: P. Lankoski and J. Holopainen, eds. 2017. Game design research: *An Introduction to Theory & practice*. Carnegie Mellon University: ETC Press. Ch.4.

Knight, W., 2020. How to be a better designer by understanding human perception. UX MAGAZINE, [Online] Available at: <https://uxmag.com/articles/how-to-be-a-better-designer-by-understanding-human-perception> [Accessed 15 October 2023].

Piaskiewicz, M., 2019. Level Design Principles – Familiarity. Game Developer blog, [Blog] 3 May. Available at: https://www.gamedeveloper.com/design/level-design-principles---familiarity [Accessed 16 October 2023].

Rosewater, M., 2016. Magic: the Gathering: Twenty Years, Twenty Lessons Learned, GDC. [video online] Available at: <https://www.youtube.com/watch?v=QHHg99hwQGY> [Accessed 10 October 2022].

Walk, W., Görlich, D, and Barrett M., 2017. *Design, Dynamics, Experience (DDE): An Advancement of the MDA Framework for Game Design.* DOI:10.1007/978-3-319-53088-8_3

Ware, C., 2008. Visual thinking for design. Burlington: Morgan Kaufmann.