

# Oscillatory Design to Develop Moral Engagement Through Systemic Play

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## ABSTRACT

This paper presents a theoretical framework that categorises the design paradigms commonly observed in ethically relevant games. This theoretical framework was developed based on game design factors responsible for the player's decision-making process and their role in signifying morality in the gameworld. The model's development was followed by an evaluation process constituting in-depth semi-structured interviews conducted with ten professional game designers with industry experience.

Secondly, this paper proposes an oscillatory, system-based approach to ethical gameplay in serious games. In this approach, elements from both scripted and systems-based design methods are used in a to-and-fro oscillatory manner to design a systems-based ethical game.

## Keywords

Cybersecurity, Ethical Gameplay, Systemic Play, Game Design, Morality

## INTRODUCTION

In serious games developed for cybersecurity training purposes, there is a perceived dissonance between the design methodology used for developing the low-level technical aspects of the game and the high-level social and moral aspects. In this case, the high-level interpretation utilises a scripted approach where the designer handcrafts each ethical dilemma at a low level, presenting these scenarios to the player with fixed branching pathways (Katsarov et al. 2019; Schrier 2015). On the other hand, the low-level interpretation uses a systems-based approach, which allows the designer to develop a set of gameplay systems that integrate the game's ethical system as interactive processes (Christen et al. 2013). This dissonance can be seen in commercial cybersecurity training games such as CyberProtect (Carney Inc. 2010) as well as in academic projects like CyberCiege (Cone et al. 2007) or Anti-Phishing Phil/Anti-Phishing Phyllis (Sheng et al. 2007).

As a result, while training technical aspects takes advantage of a game's nature as a procedural rhetoric, training of socio-cultural and moral aspects resorts towards more

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traditional methods. One possible reason for this conflicting methodology is the ease of accessibility in simulating low-level, technical aspects of the domain as opposed to the high-level, ethical, and moral aspects, which may require more nuanced approaches to developing a robust, cohesive gameplay system that organically produces ethical dilemmas and scenarios (Ryan et al. 2012). Secondly, a systems-based design risks moral disengagement within the player, as the player may part away from the moral components of the system and focus majorly on the technical aspects of play. (Krcmar and Eden 2019; Melzer and Holl 2019).

With this in mind, this paper's primary question is, "How can systemic play be designed to better maintain moral engagement?" A follow-up aim to this research problem is to examine how the player can be morally re-engaged when/if they experience disengagement.

As such, this research will attempt to bridge the gaps between scripted play and systemic play, found in serious games developed for ethics training in technical domains. The project will draw upon various frameworks from moral psychology, learning theories, game design and cybersecurity ethics to develop a model allowing for the development of low-level technical processes and high-level ethical interpretation in a uniform gameplay system. This uniform model will aim at enabling a cohesive system where the high-level ethical interpretations are weaved into the low-level technical system by taking advantage of video games' capability of being a procedural rhetoric.

## LITERATURE REVIEW

### Moral Game Design

We can observe a pattern of a dichotomy between the two types of design processes observed in developing cybersecurity ethics training games, low-level and high-level. As previously discussed, the high-level interpretations are based on a scripted approach, while the low-level interpretations are based on a systems-based approach. These two design methods of designing serious games for cybersecurity ethics also rely on two different approaches to learning.

#### *Scripted Approach*

The scripted approach to game design is where the designer handcrafts a game's internal structure, including gameplay, visuals, audio, and narrative. It allows the designer to possess complete creative control over the narrative and the structure of play. In the scripted approach, the designer's primary role is to intricately develop every aspect of the game's model to facilitate a consistent experience for the player, although this still will not guarantee that every player will experience the game the same way (Formosa, Ryan, and Staines 2016).

Branching narrative design techniques are a commonly observed design choice that facilitates this approach to game design. In the scripted version, the designer handcrafts the narrative structure and critical narrative beats, where the player must make decisions to progress in the game. The player's role here is to choose an option they broadly agree with and experience the corresponding outcome, which they may or may not agree with. The outcomes of these choices are often in the form of pre-authored or pre-rendered animation per the designer's desire.

#### *Systems-based approach*

On the other hand, in systemic play, the designer's authorial control is more implicit. Rather than handcrafting the game experience, they are tasked with developing a robust enough system to facilitate a varied, personalised experience for the player. In this

approach, the developer delegates the authorial control to the player by presenting them with a set of systems that interact with both the procedural and semiotic layers of the game.

In the systemic play, the narrative beats are generated because of multiple systems interacting with each other. Following Bogost's procedural rhetoric, this weaves not only the learning goals but also the narrative conflicts within the interactive processes of the game's system (Bogost 2007). It further allows the player to associate the abstract concepts the developer wants to convey more easily with the rules of the system. For example, a real-time strategy game developed around the concept of a world energy economy could be used to convey concepts of energy production and its environmental effects (Bellotti, Berta, and De Gloria 2010).

### *Moral Disengagement*

Moral disengagement occurs when we fail to address the ethical implications of our actions (Bandura 1999; Moore 2015). We can identify two forms of moral disengagement that can occur both in real life and during play: intuitive and deliberative. Intuitive disengagement or 'ethical fading' occurs when an individual fails to recognise the ethics of their choices due to prioritising other factors (Bazerman and Tenbrunsel 2011). In systemic play, this might occur when the cognitive load of gameplay causes the player to neglect moral concerns (Formosa, Ryan, and Staines 2016). Deliberative disengagement refers to post hoc rationalisation when an individual reframes unethical behaviour as morally acceptable (Bandura 1989; Moore 2015).

In the systemic play, a lack of narrative framing can allow players to dehumanise non-player characters, providing an excuse to morally disengage and reduce self-condemnation (Hartmann and Vorderer 2010). Additionally, this inclination to disengage from morality in games can be further compounded by the player's perspective of "it's just a game", causing them to not focus on the ethical and moral concerns of the gameworld (Hartmann and Vorderer 2010).

## **OBSERVED DESIGN FACTORS IN MORAL GAMEPLAY**

Initially, a theoretical framework was developed to establish an understanding of scripted and systemic design approaches at a low level where the decision-making process occurs, how it crafts the player experience and how it signifies morality in the game world.

At a conceptual level, the scripted method approaches moral engagement by limiting agency while being comprehensive; on the other hand, the systemic method approaches it by supporting player agency while being abstract. However, it is necessary to understand how each design factor affects engagement at a lower level where the decision-making process occurs, how it crafts the player experience and how it signifies morality in the game world.

As a result, we identified the following design factors that affected moral engagement as well as determine whether a game aligns with a scripted or systemic configuration:

- **Atomicity of Choices.** The atomicity of choices in games relates to the level to which a big decision is granulated into more minor decisions (Formosa, Ryan, and Staines 2016). In ethical games with scripted gameplay, the decision tree represents a coarse-grained structure with less frequent but high-impacting choices. On the other hand, with systems-based gameplay, there is a much more moment-to-moment fine-grained structure with frequent but low-impact decisions.

- **Aggregation of Choices.** The aggregation of choices determines the extent to which an outcome is a consequence of the aggregation of past player choices (Formosa, Ryan, and Staines 2016; Kahn 1966; Sicart 2013). In games with scripted gameplay, the aggregation of choices is done by the designer, being solely responsible for compiling and interpreting a given scenario and its resolutions. On the other hand, in systemic play, the player aggregates and interprets their decisions while the designer merely provides a gameplay system generating interesting decisions.
- **Conflict between Layers of Abstraction.** Interesting choices occur when the elements from the procedural layer conflict with those from the semiotic layer conflict with each other (Sicart 2013)

## **OSCILLATORY FRAMEWORK**

Based on this theoretical framework of moral design factors and taking concepts from scripted design, we are currently developing an oscillatory approach to develop ethical systemic gameplay.

In this method, the designer simultaneously develops the scripted and systemic versions of the game by going back and forth between the two renditions. The core idea is that the game's scripted version follows a coarse-grained, designer-aggregated decision structure, resulting in multiple micro-decisions being grouped into larger chunks. Following this, we break this chunk into smaller micro-decisions and translate them into interactive processes as part of a larger gameplay system.

### **Stage 1**

In the initial stage, the designer focuses primarily on the scripted version of the game. Mapping out the critical decision-tree structure and the narrative beats, the designer develops a scripted rendition where these narrative beats are integrated inside a larger scenario with pre-determined resolutions.

After a scenario is resolved, the player moves on to the following sequence of events, which may or may not depend on the previous scenario.

### **Stage 2**

The primary idea of this stage is to identify the variables and remove the pre-scripted sequence of events established in Stage 1.

As such, in Stage 2, the player identifies common themes and concepts between scenarios (from the scripted version), extracting abstractions which could be used as part of a gameplay system. This gameplay system is initially developed using only the abstraction as contextual cues but without the pre-scripted narrative overhead. Following this, the attention is again focused on the scripted version with the idea of extracting and establishing the dynamics between the abstractions.

### **Stage 3**

In Stage 3, the system is played out with the mechanics and dynamics established in Stage 2.

The scenarios in Stage 3 are expected to be generated due to the interactions between the abstractions. Furthermore, there is an expectation of a high overlap between the pre-scripted and dynamically generated scenarios. However, the critical difference is that we would see greater freedom of choice to resolve the scenario in the second case.

## Stage 4

In Stage 4, the new resolutions to the dilemmas will be converted back to the scripted version by enforcing the relevant narrative structure and design elements.

At the current stage, the model is being developed and applied to an ethical game where the player performs the role of a systems administrator at a small-scale hospital. In this case, two versions of this game are currently being developed, one scripted and the other systemic, through the application of the stated oscillatory model.

Being highly experimental, the model will be simultaneously developed throughout the design of the games.

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