ABSTRACT

Title of Thesis: LUDIC BORDERS

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Game design techniques are used to motivate participation in professional, educational, political, and social environments. This research study introduces the theory of ludic borders to examine how the boundary of gamespace is a design product that influences players beyond increasing motivation. Framing the crossing of the ludic border as a negotiation between the design choices of the game designer and the identity of the player, this research considers how game design elements such as visual aesthetics and collaborative mechanics influence the construction of the border. In addition, this research considers how particular characteristics of a player's identity, such as the frequency with which they play games, influences their crossing of the ludic border. Based on gameplay observation, this research finds that visual aesthetics, gaming frequency, and other factors can influence the extent to which a player expresses their beliefs through their in-game decisions.

LUDIC BORDERS

by

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Chapter 1: Introduction

Across a variety of contexts, political, professional, social, and educational, game design techniques are routinely deployed to increase motivation, sustain participation, and ease the burden of psychologically draining tasks. Jane McGonigal suggests in her work *Reality is Broken: Why Games Make Us Better and How They Can Change the World* that, "a good game is a unique way of structuring an experience and provoking positive emotion. It is an extremely powerful tool for inspiring participation and motivating hard work."[1] McGonigal is one of several prominent game designers and researchers arguing for the proliferation of games and "gamefulness" as a means to enhance our lives in spaces not traditionally associated with play or games. This practice has taken numerous forms and titles, notably "gamification" and "gameful design."[2]

Arguments in favor of gamification and related concepts approach *games* as a collection of design components and *play* as a form of engagement with those collected components. For McGonigal, these components are a goal, rules, feedback system, and voluntary participation.[3] While this definition serves its purpose in McGonigal's work, it minimizes conceptualizations of games and play that understand these phenomena as having a significant spatial and temporal element. Focusing attention on these spatial and temporal elements, Johann Huizinga writes in *Homo Ludens: A Study of the Play-Element in Culture*, "Play is distinct from 'ordinary' life both as to locality and duration.

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[1] Jane McGonigal, *Reality Is Broken: Why Games Make Us Better and How They Can Change the World*, Ed. with a new appendix 2 (New York: Penguin Books, 2011), 33.
[2] Steffen P. Walz and Sebastian Deterding, eds., *The Gameful World: Approaches, Issues, Applications* (Cambridge, Massachusetts: The MIT Press, 2014).
[3] McGonigal, *Reality Is Broken,* 20-21.

This is the third main characteristic of play: its secludedness, its limitedness. It is 'played out' within certain limits of time and place. It contains its own course and meaning."[4] The idea that the play of a game exist as a set space within a set time is often discussed as a "magic circle," a term found in *Homo Ludens* and explored more deeply in Katie Salen and Eric Zimmerman's work, *Rules of Play: Game Design Fundamentals*.[5] These spatial and temporal elements are treated as boundaries or perimeters, bounding rings that mark the beginning and end of play. Put another way, Salen and Zimmerman identify the boundary of gamespace as the demarcation of spacetime in which players operate within the "special rules" or meanings of the game.[6]

In this research study, I develop the idea of the boundary as a border, as a threshold that is encountered and negotiated by the player. I use the language of ludic borders to describe the ways in which entering the space of the game mirrors the movement across borders. I outline a conceptual framework for ludic borders, identify the ways in which game designers construct these borders as they design gamespaces, and seek to understand how encounters at the border influence and even distort how people make decisions and interact with one another once they enter into gamespace.

There are three aspects that make the crossing into gamespace a border crossing: (1) the individual crossing experiences a change to their identity as part of the transition from their role in the *real-world* to their role in the *gameworld*; (2) the crossed space is

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[4] Johan Huizinga, *Homo Ludens: A Study of the Play-Element in Culture* (Angelico Press, 2016), 9.
[5] Katie Salen and Eric Zimmerman, *Rules of Play: Game Design Fundamentals* (Cambridge, Massachusetts: MIT Press, 2004), 92-99; Huizinga, *Homo Ludens: A Study of the Play-Element in Culture*, 10.
[6] Ibid, 9.

the product of design decisions and not an incidental manifestation of defining an area; (3) the crossing, and the changes that it produces, emerge from a negotiation between the player and designer, who has invested the border with specific design attributes. The first aspect is critical for understanding instances when a player departs from their individual beliefs and worldview within gamespace. I articulate this departure as a change in identity to describe how players adopt roles and attitudes within gamespace that diverge from their real-world ideological views. This conception of identity is broader than *roleplay* but less encompassing than *human identity* in the political and culture sense; this research refers to changes or shifts in identity to articulate the transformation in decision-making players undergo within gamespace. I therefore view gamifying a space, be it political, professional, social, or otherwise, to not only alters an individual's motivation to participate but also the ways in which they participate. The second aspect distinguishes a boundary or perimeter from a *border* in the political sense, a distinction between simply locating the edge of a space and identifying a constructed and designed area that interacts with each individual that passes in and out of the space. This research examines the characteristics of these bounding rings and its influence on players as they enter gamespace. The third aspect identifies how the experience of crossing a ludic border is a consequence of factors unique to both the individual player and the design of the game and is therefore a dynamic negotiation between player and designer as opposed to a uniform phenomenon happening consistently across all games or all players. In this way, both players and game designers share control over the player-identities and approaches to decision-making that occur in gamespace.

I conceive of the bounding ring of the magic circle as a border to analyze how entering a gamespace is not just a shift from following the rules of the *real-world* to following the rules of the *gameworld* but also constitutes the crossing of a border space that can dynamically alter our ideological expression, how we think about problems, and how we form and value relations with each other. These changes constitute the "change or shift in identity" previously discussed. With this understanding, I argue that we cannot approach the injection of "gamefulness" or the gamification of an environment as a neutral act that only serves, as McGonigal says to, "inspire participation and motivate hard work."[7] This research builds upon an understanding of the ways in which our gameworld lives instruct our real-world behaviors, and seeks to understand how individuals respond ideologically to the affective space of the game.

I outline an approach to the theory of play that focuses on the boundary of the magic circle. Conceptualizing this liminal space as a ludic border, I examine encounters with this border through the lens of *Energy CG*, a card game I designed that asks players to determine energy policy and make environmental decisions at a national scale. Through an empirical study that assesses the extent to which people play games in ways that reflect their beliefs, I offer a set of design recommendations for how game designers might intentionally construct ludic borders in their game to produce desirable effects.

Chapter 2 reviews related literature that is foundational for the conception of ludic borders presented in this research, the design approach for the creation of *Energy CG*, and the motivations and methods of the empirical study to analyze ludic borders in *Energy CG*. This chapter offers insight into the theoretical and design underpinnings

[7] McGonigal, *Reality Is Broken,* 33.

from across game studies, human-computer interaction, and information studies that lend themselves to this research.

Chapter 3 develops a working theory for ludic borders, exploring the experience of crossing the border and identifying examples in commonly known games such as *Civilization VI*. Based on observed patterns among game designers and players, I develop ludic borders as a conceptual framework to consider the ramifications of extending game design techniques beyond the traditional spaces associated with games.

Chapter 4 introduces the game *Energy CG*, which I designed and incorporated into the research methods detailed in chapter 5. I detail my design approach and its relationship with the theories of play and approaches to game design outlined in chapter 2 and my own conception of ludic borders outlined in chapter 3.

Chapter 5 reviews the methods, findings, and analysis of a mixed-methods empirical study to evaluate the presence and influence of ludic borders in the game *Energy CG*. With an emphasis on observed data from several game sessions, I compare each participant's self-reported beliefs about environmental issues, energy policy, and climate change to the decisions they made during gameplay to assess how their beliefs influenced their decisions. I find that game design elements such as visual aesthetics and collaborative game mechanics can shift players closer and farther from their ideological beliefs during gameplay. In addition, I discuss how players become acclimated to crossing ludic borders as frequent gamers tend to towards experimentation away from their ideological beliefs. Finally, I consider temporal dimensions of a player's crossing of the ludic border, as well as the ways in which a player's alignment of their beliefs and their in-game decisions is influenced by the other players they share gamespace with.

Chapter 6 develops a set of design recommendations that extend the findings of the empirical study to inform approaches to game design at large. I identify the relative effectiveness of my design decisions to produce a ludic border with particular characteristics based on the player responses to *Energy CG* discussed in chapter 5. I discuss how a game designer's approach to visual design, competition and cooperation, and gameplay introductions can influence the construction of the ludic border.

Chapter 7 offers concluding comments, detailing the limitations faced while completing this research, and laying out pathways for future research. I discuss how the theory of ludic borders might draw on additional bodies of literature, potential improvements to the methods used in the empirical study, and alternative designs for *Energy CG* that might produce a ludic border more aligned with my intentions.

Chapter 2: Related Literature

This study builds upon three areas of research that cut across game studies, information studies, human-computer interaction (HCI), and platform studies. Through the theoretical underpinnings found in each research area outlined below, this study investigates the moment of crossing over what I term "ludic borders," how this crossing is similar and dissimilar to movement across national political borders, and how ludic borders equip us to better understand the influences that act upon an individual when they enter into a space of play.

The first research area considers how games and acts of play influence our imagination of who we are and how we see the world beyond the game. *Critical Play: Radical Game Design* by Mary Flanagan provides a historical account of play as a cultural phenomenon that informs political ideology, social allegiances, and cultural practices. *Persuasive Games: The Expressive Power of Videogames* by Ian Bogost examines how games make arguments about their subject matter. Both Flanagan and Bogost describe how games contain an influential power that can be disruptive and subversive or used to reinforce existing hegemonies and societal structures. I also turn to Emma L. Holliday's research, which seeks to use game design practices to implement the theories articulated by Flanagan and Bogost and increase the movement of information and beliefs across gamespace and the real-world.

The second area examines the concept of the magic circle as articulated first by Johan Huizinga in *Homo Ludens* and expanded on by Katie Salen and Eric Zimmerman in *Rules of Play*. Their work conceptualizes the space of play and the cultural activity of playing as something separate from real life. In addition, I return to Holliday who

characterizes their approach as “breaking” the magic circle, as well as bring in the work of Sarah-Kristin Thiel who analyzes the extent to which game design practices shape the movement across the magic circle. Thiel’s work emphasizes the significance of individual game design elements and offers a useful differentiation between the ways in which games increase the “quantity” versus “quality” of participation.

The third area seeks to understand the possibilities and consequences of extending game design practices beyond the traditional domains in which we encounter games. I contrast the work of McKenzie Wark, Jane McGonigal, and Ian Bogost who consider “gamification” and “gamefulness” from different perspectives, the extent to which game design has already encroached upon the rest of our lives, and whether such an encroachment is a good thing.

2.1 How Play Changes Us

This study draws on two key texts for understanding how games as type of system which we experience, and play as a culturally particular activity, influence who we are and inform our decisions beyond the boundaries of the game. I use this set of research as a starting point for understanding how a player’s encounter with a ludic border influences their decision-making in gamespace.

In *Critical Play*, Mary Flanagan traces the lineage of gaming through the lens of art history, examining how different forms of play, including playing house, *Monopoly*, and *World of Warcraft*, become ideologically potent experiences that act upon the player. Looking at Victorian era doll play among girls, Flanagan draws on the work of Miriam Formanek-Brunell, who argues that a tension existed between the purpose set out by

adults encouraging doll play and the actions of the girls actually playing with the dolls.[8] In Formanek-Brunell's view, adults viewed doll play as conducive to a "feminization" of the player.[9] However, Formanek-Burnell exposes the ways children would often play with the dolls as a means to explore their own psyche or experiment with the subversion of the social frameworks in which they lived. Formanek-Brunell identifies the ways in which playing house acted socially and culturally upon Victorian-era girls, and Flanagan goes further to argue how the girl's specific decisions, how they chose to play, factored into how the game acted upon them. In this way, entering into the gamespace of doll play did not merely subject the girls to the beliefs of the game designers – both the creator of the dolls and the adults who instructed them to play with the dolls in a particular way – but also produced a space of possibility in which the girls as players were able to produce new and unintended imaginations of themselves and their social relations through the game. Flanagan uses the term *critical play* to describe the modality of an individual who approaches play as a means to consider questions about human life.[10] Within the context of my own research on ludic borders, the capacity to play critically gives form to the agency players have to negotiate the crossing of the border and thereby shape the ways in which ludic borders and gamespace act upon them.

Ian Bogost argues in *Persuasive Games* for "procedural rhetoric" as the modality through which games make arguments about the world to the player. Bogost defines

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[8] Mary Flanagan, *Critical Play: Radical Game Design* (Cambridge, Mass. London: MIT Press, 2013), 31.
[9] Miriam Formanek-Brunell, *Made to Play House: Dolls and the Commercialization of American Girlhood* (New Haven, CT: Yale University Press, 1993), 37 quoted in Flanagan, *Critical Play*, 35-37.
[10] Flanagan, *Critical Play*, 6.

procedural rhetoric as "the practice of authoring arguments through processes…through the authorship of rules of behavior, the construction of dynamic models," which highlights the back and forth characteristics of play as a call and response between a player's decisions or inputs and the game's rules.[11] Bogost's research considers how participation in the interactive processes of a game produces a rhetorical function that can influence the player's beliefs and perceptions beyond the game world.

In comparison to Flanagan, whose work on critical play highlights how the decisions of the player produce meaning, Bogost emphasizes the role of the designer who produces processes which amount to procedural rhetoric. Each of these aspects are important for establishing the ways in which playing games acts upon the player. In particular, I am interested in how the characteristics associated with a specific game *and* the individual player both factor into how games act upon people. I see the interaction at the border of gamespace as the consequence of both critical play, a player's decisions, and procedural rhetoric, a designer's decisions, and that this dialectic between player and designer occurs spatially through the game as a medium and gamespace as a site to provoke and persuade.

HCI practitioners such as Emma L. Holliday have worked to bring the theories articulated by Flanagan, Bogost, and others that underlie definitions of "persuasive games" and "serious games" to bear on HCI research.[12] In a recent study, Holliday

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[11] Ian Bogost, *Persuasive Games: The Expressive Power of Videogames*, 1. MIT Press paperback ed., [Nachdr.] (Cambridge, Mass.: MIT Press, 2010), 28-29.
[12] Emma L. Holliday, "Breaking the Magic Circle: Using a Persuasive Game to Build Empathy For Nursing Staff and Increase Citizen Responsibility During a Pandemic," in *Extended Abstracts of the 2021 Annual Symposium on Computer-Human Interaction in Play* (New York, NY, USA: Association for Computing Machinery, 2021), 339–44, https://doi-org.proxy-um.researchport.umd.edu/10.1145/3450337.3483511.

produced a game that, "explores themes of blame culture and [the] impact of citizen behavior on others during a pandemic," specifically in relation to COVID-19.[13] Holliday articulates two goals for her design approach: First, to "persuade people to follow COVID-19 safety guidance more strongly;" and second, to "encourage people to empathize with the experiences of medical staff during the pandemic."[14] Holliday developed a design method for games to not only be informative to the player, but to also shift their worldview and increase empathy through self-reflection; her work reinforces the many ways in which HCI game design methods can put theories of serious and persuasive games, such as Bogost's procedural rhetoric, into practice. The design of *Energy CG* is situated alongside games such as those designed and cited by Holliday that have the explicit purpose to act upon the player and shift their worldviews either during or after gameplay.

2.2 The Magic Circle

Spatial conceptions of games and play often adopt the language of the "magic circle" from Huizinga's *Homo Ludens*, in which he argues the following regarding play: "More striking even than the limitation as to time is the limitation as to space. All play moves and has its being within a playground marked off beforehand either materially or ideally, deliberately or as a matter of course…The arena, the card-table, the magic circle, the template, the stage, the screen, the tennis court, the court of justice, etc., are all in form and function play-grounds, i.e. forbidden spots, isolated, hedged round, hallowed,

[13] Ibid, 1.
[14] Ibid, 3.

within which special rules obtain."[15] Huizinga's articulation of play is concerned with both physical and metaphorical space. Physically, play requires a space to be demarcated as the area in which the "special rules" of the game hold power, be it a football field, a chessboard, or a virtual world. Huizinga identifies the playground space as containing a certain "order," "aesthetic," and "tension," qualities that act upon those within the space in ways that both contain and motivate, restrict and inspire.[16] I am interested in these qualities of the magic circle that drive players to act and think differently about themselves and their relations. Huizinga positions "tension" as a subset of "aesthetic" and describes tension as a motivating force that emerges from the desire of players to overcome some obstacle.[17] My conception of ludic borders picks up on the other aspects of aesthetic that Huizinga offers less specifics on; he lists them as: "poise, balance, contrast, variation, solution, resolution, etc."[18] In considering these other qualities, I posit that how these aesthetics emerges through game elements such as visual design and collaborative mechanics contributes to the construction of the ludic border and influences player behavior and thinking beyond the tension of striving to win.

Katie Salen and Eric Zimmerman foreground Huizinga's "magic circle" in *Rules of Play*. They connect the magic circle to Steve Sniderman's concept of the "frame" of play, defined as the player's sense that the game is ongoing.[19] Salen and Zimmerman are largely interested in the magic circle as a means to tell when and where play is occurring and what signifies its beginning and end. The authors briefly pursue the question of the

[15] Huizinga, *Homo Ludens: A Study of the Play-Element in Culture*, 10.
[16] Ibid, 10.
[17] Ibid, 10-11.
[18] Ibid, 10.
[19] Salen and Zimmerman, *Rules of Play*, 94.

magic circle's borders, though they do not distinguish "border" from "boundary" and primarily view the question through the lens of permeability — the extent to which the space of the magic circle is truly separate from "ordinary reality."[20] Their approach falls back to the game as a system, as opposed to a space; Salen and Zimmerman offer three schema — rules, play, and culture — and argue that a game is an open, closed, or hybrid system depending on which schema we understand games through.[21] As they put it, "the answer to the question of whether games are closed or open systems, whether they are truly artificial or not, depends on the schema used to analyze."[22] Salen and Zimmerman see permeability as something that lies with the researcher and their method, not the game and its designer. My conception of ludic borders picks up on Salen and Zimmerman's question of permeability, understanding it as the extent to which information and culture are carried across the borders of play as the player enters into the game. However, I also show that crossing the ludic border transforms and filters the information and culture being carried and that the permeability of the magic circle is a product of design.

In their work on the magic circle, Salen and Zimmerman borrow from Bernard Suits' work the concept of "lusory attitude," a disposition that encourages players to play by the rules, even when the rules restrict the most efficient way to complete the tasks set out by the game.[23] The lusory attitude is what allows the player to find the constraints of gameplay fun. While this framework is useful for thinking about the ways in which

[20] Ibid, 96.
[21] Ibid, 96-97.
[22] Ibid, 97.
[23] Ibid, 97-98.

gamespace influences an individual's behavior and decision-making, it nonetheless limits its focus to why people continue to play, but not why they are playing in certain ways. I am interested in how different modalities of gameplay can emerge among a group of people playing the same game together and how the influence of gamespace is not uniform across players. Ludic borders sheds light on how game design elements catalyze several attitude and perspective shifts in the player, including a desire for experimentation, simulation, and exploration.

In "Breaking the Magic Circle," Holliday introduces a design approach to "break" the magic circle and increase the capacity for games to influence the player's real-world behaviors.[24] Specifically, in her game simulating the experiences of nurses during a pandemic, players must answer questions about their real-world behaviors and, depending on their answers, the difficulty of the proceeding level changes.[25] By creating a direct link between a player's real-world behavior and their in-game experience, Holliday forces players to confront the consequences of their real-world decisions in order to encourage self-reflection and change. By offering a pathway for game designers to directly influence the permeability of the magic circle, Holliday distinguishes her approach from Salen and Zimmerman's. However, Holliday is primarily concerned with the extent to which the game's rhetoric shifts player attitudes after they finish playing. While I pick up on her commitment to using game design methods to influence movement across the magic circle, I am primarily concerned with what occurs during gameplay, not after.

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[24] Holliday, "Breaking the Magic Circle: Using a Persuasive Game to Build Empathy For Nursing Staff and Increase Citizen Responsibility During a Pandemic," 3.
[25] Ibid, 3.

Sarah-Kristin Thiel has approached the concept of the magic circle and the practice of gamification from an HCI perspective that informs this work in several ways. Thiel shifts focus from how games broadly motivate people to how specific game elements contribute to motivation. In a series of research articles looking at "gamified participation" and "social gamification" in civic spaces, Thiel analyzes the relative influence of different game elements, such as cooperative play and reward systems, on increasing motivation.[26] This approach parallels the difference I've established between how games broadly have ludic borders versus how game designers create ludic borders with particular characteristics through their design decisions. While ludic borders are present in all games, their shape, potency, and qualities differ based on the design of each individual game. Thiel also shifts focus from looking from what she describes as the "quantity" of participation to the "quality" of participation. For Thiel, quality is largely about whether or not an individual is motivated to participate earnestly or just enough to receive positive feedback from the gamified systems.[27] This move steps beyond assessing motivation as a means to increase participation as measured by time spent, to considering

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[26] Sarah-Kristin Thiel, "Investigating the Influence of Game Elements on Civic Engagement," in *Adjunct Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2015 ACM International Symposium on Wearable Computers*, UbiComp/ISWC'15 Adjunct (New York, NY, USA: Association for Computing Machinery, 2015), 819–23, https://doi.org/10.1145/2800835.2804403; Sarah-Kristin Thiel, "Uncovering the Influence of Game Components on Creativity," in *Proceedings of the 2018 Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts*, CHI PLAY '18 Extended Abstracts (New York, NY, USA: Association for Computing Machinery, 2018), 637–45, https://doi.org/10.1145/3270316.3271515.

[27] Sarah-Kristin Thiel, "Gamers in Public Participation: A Boon or Bane? Influence of Attitudes in Gamified Participation Platforms," in *Proceedings of the 15th International Conference on Mobile and Ubiquitous Multimedia*, MUM '16 (New York, NY, USA: Association for Computing Machinery, 2016), 229–40, https://doi.org/10.1145/3012709.3012723.

whether the increase in activity as a result of game design techniques produces the sincerity of engagement found in non-gamified participation. Thiel's work thus aligns with my work on ludic borders, particularly with respect to how gamespace acts upon players beyond motivating them to participate in the game. Gamespace can also distort and filter ideological views. Thiel's research has identified times when motivation or "quantity" of participation increases while the "quality" decreases.[28]

2.3 Expanding Gamespace

If games act upon us in particular ways that are unique to each game and that emerge specifically from characteristics associated with the spaces in which gameplay occurs, then it is critical to understand what environments exist as forms of gamespace and thereby produce such influences. It is on the edges of these gamespaces that ludic borders are found. In *Gamer Theory*, McKenzie Wark considers the ways in which gamespace has expanded to encapsulate the whole of human life.[29] Arguing that everything from war to career pursuits can be understood as an extension of gamespace, she considers games as no longer distinguishable from a "real world." Reflecting on divisions between work and play, Wark argues:

> Play is no longer a counter to work. Play becomes work; work becomes play…The utopian dream of liberating play from the game, of a pure play beyond the game, merely opened the way for the extension of gamespace into every aspect of everyday life. (Wark 016).

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[28] Ibid.
[29] McKenzie Wark, *Gamer Theory* (Cambridge, Mass: Harvard University Press, 2007) 001-025.

Wark condemns this state of affairs, relating it to the agony of the prisoners in Plato's Cave, except that there is no exit to the surface world, only an endless string of more caves. She enumerates how the characteristics we associate with games imbue other aspects of our lives, transforming them into a gamespace which acts upon us in ways that reflect our relationship with conventional games.

In contrast to Wark, Jane McGonigal calls for the proliferation of game design and gamefulness, particularly in professional spheres.[30] McGonigal suggests that gamespace has yet to expand and that we are worse off as a result. Optimistically looking at the potential for game design to positively change every aspect of human life, McGonigal notes, "If we take everything game developers have learned about optimizing human experience and organizing collaborative communities and apply it to real life, I foresee games that make us wake up in the morning and feel thrilled to start our day."[31] McGonigal looks positively on the extension of gamespace, arguing that the ability for game design to motivate people to overcome obstacles is a boon.

My conception of ludic borders builds from the overlaps in Wark and McGonigal's work while offering a lens through which to consider the differences. Both Wark and McGonigal support the idea that gamespace and game design can be extended beyond the traditional game setting into other areas of human life. Further, they both identify changes in our psychological and ideological selves occurring upon entrance into gamespace. They differ on the extent to which the expansion of gamespace has already occurred and whether such an expansion constitutes a positive or negative shift in our

[30] McGonigal, *Reality Is Broken.*
[31] Ibid, 14.

lives. My conception of ludic borders creates space to consider the positive, negative, and neutral facets to these changes, as well as understand the impact of gamespace not only on motivation, but also beyond it.

In comparison to Wark and McGonigal, Ian Bogost interprets the specific term "gamification" as "bullshit", in the meaning of bullshit articulated by Harry Frankfurt.[32] Bogost views gamification largely as a marketing trend peddled by management consultants who see an opportunity in the increasing corporate interest and social fear towards the rising popularity of games.[33] While this work is not concerned with the differences in which "gamification", "gamefulness", "game design", and other terms have been deployed by particular interests, Bogost's argument is an important reminder that not every experience that has been associated with games actually reflects the practice of game design or the activity of play. Instead, as Bogost argues, "gamification" is often deployed as a rhetorical hook and lacks clear connections with games as a design medium.[34] In this study, I move forward with a conception of ludic borders that seeks to discern when game design authentically supports play versus when the language of games and play are simply deployed as a marketing tactic.

In October 2021, Facebook, one of the largest companies in the world by market cap and the owner of the largest social media platform, changed its name to Meta and began trading under the stock ticker MVRS. On their launch site, they describe their conception of the metaverse: "3D spaces in the metaverse will let you socialize, learn,

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[32] Ian Bogost, "Why Gamification Is Bullshit," in *The Gameful World: Approaches, Issues, Applications*, ed. Steven P. Walz and Sebastian Deterdin (Cambridge, Massachusetts: MIT Press, 2014), 65.
[33] Ibid, 67-77.
[34] Ibid, 68.

collaborate and play," as well as, "The metaverse will be a place where we can work, play, and connect with others in immersive, online experiences."[35] Together, the announcement signals an interest in online environments that integrate our social, professional, and educational lives and blend them with notions of play. The design of these online environments, as well as the Meta's attempt to shift various spheres of public and private life toward realms akin to those experienced in video games, mirror many of the impulses, arguments, and approaches found in gamification. This is a shift in language from "gamification" to "metaverse" and increased emphasis on virtual worlds as the site of intervention, but the stakes of blending gameplay with political, social, professional, and civic spaces remain the same. Research on and implementation of "the metaverse" remains in a nascent stage and I see it as an important theater for considering the relevance of ludic borders in contemporary life.

[35] "Welcome to Meta | Meta," accessed March 31, 2022, https://about.facebook.com/meta/.

Chapter 3: Theorizing Ludic Borders

3.1 Borders of Play

The ludic border exists on the edge of gamespace, the overlap between *rulespace* and *playspace*. *Rulespace* and *playspace* operate as a set of designed systems of governance over an area, be it a virtual world, a game board, or a tennis court. For the purposes of this research, I define these terms as follows: *Designed*, intentionally produced through human action; *Systems*, reactive and responsive to input; *Governance*, utilizing methods of control. *Rulespace* governs decision-making through a set of rules which restrict the range of decisions possible and reward those within the space who make decisions towards certain ends. The *rulespace* of a game may make its rules explicit through a written rulebook, the computationally implemented restrictions of a virtual world, or some other means. Rewards might be the declaration of victory, desirable experiences such as exploration or positive feedback, or tangible items useful inside or outside of the game. *Playspace* governs consequences, shifting the authority of who or what may leverage consequences, from real-world regulators to actors with roles specific to gamespace. Football's *playspace* shifts authority from real-world laws regarding the consequences of violence against other people to a referee. In a game, the shifts in consequences might be made explicit by *rulespace* or they might emerge from conceptions of fairness specific to those within the space. The rules of a video game do not make explicit if one player can hit another player's controller out of their hand or what consequences they would face if they did, but the specific conception of playful fairness among those playing may regulate such behavior.

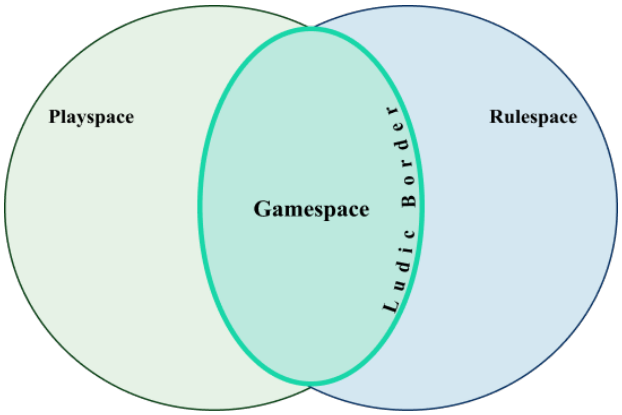

Figure 1 - Researcher's illustration of the relationship between playspace, rulespace, gamespace, and ludic borders

The distinction between *rulespace* and *playspace* found in this research is reflected in the communication patterns commonly used to declare when something is not a game or is not playful. We say "This isn't just a game" when we are frustrated with someone who is making decisions that seem to follow a special set of rules that only they know and that do not reflect what we understand to be the rational choices of our environment. Salen and Zimmerman frame this mindset as the willingness to indulge the inefficiencies dictated by the rules in order to increase the challenge of game.[36] We say "We aren't playing around" to reinforce that real-world consequences are in effect and to express frustration with someone acting as if they are immune to the consequences of real-world regulatory powers. These expressions suggest the ways in which the *rulespace* and *playspace* of a game have different functions and can act upon us independently. In this research, I consider the ludic border to be the edge of overlap between *rulespace* and *playspace*.

Crossing the ludic border between the real-world and gameworld is not an instantaneous experience but occurs as a process during which the rules and playfulness

[36] Salen and Zimmerman, *Rules of Play*, 97.

of the game are introduced to the player. It is a liminal space, falling into the second phase of Arnold van Gennep's *Rites de Passage* which Victor Turner describes as having, "attributes of either the proceeding or subsequent profane social statuses or cultural states"; it is interpreted here as containing characteristics of both the real-world and the gameworld.[37] The ludic border is the space where an individual's real-world identity and the player role defined by the game are tangled, negotiated, and untangled into a particular set of ideological expressions and relations with other players that lasts throughout their time in gamespace. While crossing the ludic border, the encounters the rules and design of the game and the other players they are crossing into the space with. During this period the player is subject to governance of *rulespace* and *playspace* but are not fully enacting gameplay because they are not yet oriented to the nature of the space and its rules. In other words, the player is no longer following the rules and attitudes of the real-world but have not yet fully stepped into their game-world identity. This period of setting up game boards and playfields, learning the rules and seeing who else is playing, and experiencing tutorials and creating virtual avatars is a *character creation phase*, a period in which players determine who they can and will be within gamespace. I refer to this transitional space as the ludic border, the boundary line along the overlapping spaces of games and play that players pass through before gameplay can be achieved. It is

[37] Victor Witter Turner, "Liminal to Liminoid, in Play, Flow, and Ritual: An Essay in Comparative Symbology," *Rice Institute Pamphlet - Rice University Studies* 60 (1974), 56-57.

the Level 0 of every game, in which the player's identity fits itself into the secluded container of gamespace.

3.2 Crossing Between

The experience of crossing a ludic border varies significantly depending on the medium of the game, as well as the specific design of the game. McGonigal offers a helpful distinction between the ways players encounter the rules of and playfulness of a game in digital versus tabletop games:

> Players begin each [digital] game by tackling the obstacle of *not knowing what to do and not knowing how to play*. This kind of ambiguous play is markedly different from historical, predigital games. Traditionally, we have needed instructions in order to play a game. But now we're often invited to learn as we go. We explore the game space, and the computer code effectively constrains and guide us. (McGonigal 26).

Building on this conception, in a tabletop game we often encounter the ludic border at the outset of play when we are first reading the rules. In video games, movement across the border can stretch over a longer duration as the rules are learned during a tutorial level or through early experimentation with the controls and inputs available in the game. How game designers communicate the rules and playfulness to the player, as well as the player's familiarity with the rules if they have played the game before, are part of the construction and experience of crossing the ludic border. In this way, we can see how frequent crossers of a particular border — someone who plays a specific game often —

may have a significantly different experience than someone crossing the border for the first time.

The moment of crossing has the potential to act upon the player in several ways. Entering the space of play is an invitation to explore and challenge the possibilities generated by the game's design. Some players experience this as the desire to experiment by making decisions they would not make outside of the *playspace* of the game. These players lean into the ways *playspace* shifts consequences, allowing them to take on roles and perform actions they would otherwise be prevented from or unwilling to do. Leaning towards *playspace* and the ways it shifts consequences for certain behaviors and decisions, these players ask themselves "Who else could I be?" and experiment in roleplay that diverges from their real-world identities to varying extents. Other players lean into the ways *rulespace* builds structures of decision-making that allow them to express their beliefs and make decisions about systems they do not have power over in the real-world. Players leaning towards *rulespace* ask "What could I do?" and explore what it would mean for their beliefs and mindset to be represented in the world of the game and thereby in the facets of the real-world that the game simulates and reflects. How these and other attitudes emerge during the crossing of a ludic border is influenced by elements of the game's design, the individual player's relationship with the game and games at large, and the other players who an individual crosses alongside or are already present in the gamespace being crossed into.

Game design elements such as visual style, opportunities for collaboration or competition with other players, aspects of the game that simulate real-world systems, and the ways in which the consequences of *playspace* do or do not hold significance beyond

the scope of the game influence the characteristics of the border. Visual styles contribute to the mood of the game and have the potential to situate gameplay within particular cultural contexts that may be associated with the art style. *Cuphead*'s use of visual styles associated with 1930s animation can evoke nostalgia, familiarity, or foreignness for a player entering its gamespace.

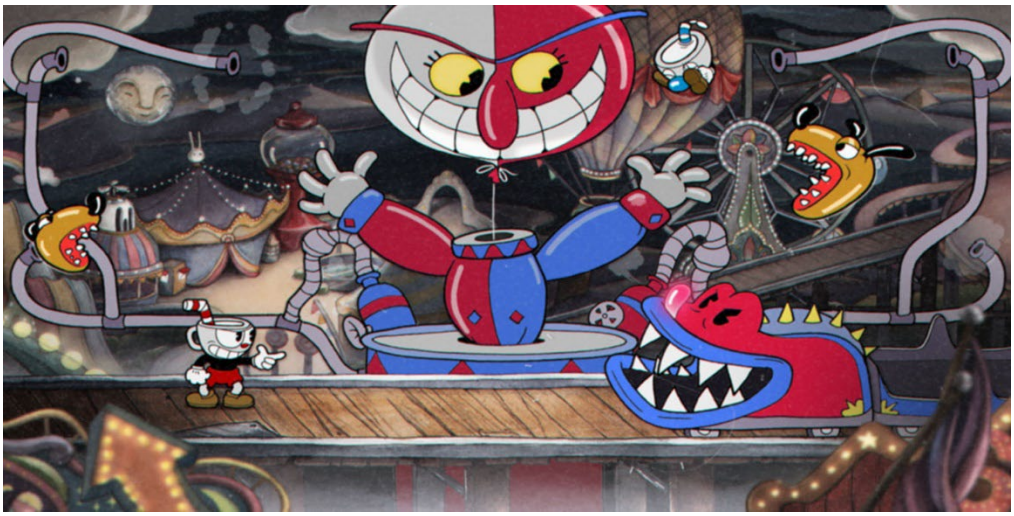

Figure 2 - Example of Cuphead's visual design

These emotive influences shape the ways players express themselves during gameplay. Similarly, the opportunity for collaboration or competition with other players can provoke aggression or induce cooperation, raise questions of trust and authority, and alter types of relations possible between players. Players who entered into gamespace with a particular type of relationship may experience it as transformed or distorted based on the possibilities allowed by the game. The potency of the influences produced by these aesthetic and design affordances is partially dependent on the degree to which *playspace* shifts consequences to create stakes that are particular to the gamespace. Games that constrain consequences to gamespace allow players to leave more of their real-world identities and commitments behind when crossing the border. Game designers can

increase the extent to which the stakes extend beyond the scope of the game to reduce the instinct to experiment and explore within gamespace.

An individual's relationship with games — how frequently they play games, the types of games they play most often, their perspective on gaming as an activity and playfulness as a modality — is a significant factor in their experience crossing the border. Frequently playing games can lessen the apprehension associated with experimentation as games provide secluded environments in which experiments can be performed with controlled and transparent consequences. In this way, games can act as a training ground to accustom individuals to experimental modalities, which in turn expands the ways in which they can play the game. This feedback loop is another way in which games instruct players how to be better players. As players spend more time crossing ludic borders broadly, their approach to negotiating these types of borders matures; players might become less resistant to the immersive qualities of gamespace and allow themselves to be drawn more deeply into the roles constructed by the game. Repeatedly crossing the border of a particular game can accustom the player to that game's unique experience as they have a better understanding of what awaits them in that particular gamespace. Knowing how a gamespace operates allows players to strategize *before* crossing the ludic border which dynamically influences their experience upon entry into gamespace depending on the reasons for playing and thereby the characteristics and purpose of their strategy.

Crossing the border in multiplayer games occurs partially as a collective experience. The other players who we are playing with negotiate their own border crossing individually, but all players are influenced by each other's presence, as is the

border itself by the number of players crossing it. The extent to which players engage in experimentation, and whether that experimentation conflicts or aligns with other player's desired modalities of play and their beliefs about the real-world systems that the game reflects, can provoke an impulse to "give up" holding onto their ideological beliefs in gamespace to join with other players and lean into experimentation, or to do the opposite, and more strongly root their gameplay decisions in their real-world beliefs in defense of those perspectives. The period of crossing between the real-world and gameworld includes acquiring knowledge about the other players occupying the same gamespace

This conception of ludic borders is supported and augmented by data collected and analyzed as part of this research study. The next section includes a worked example of ludic borders applied to *Civilization VI* in order to demonstrate how ludic borders emerge and operate. I subsequently introduce *Energy CG* and analyze the experience of border crossing based on data gathered through an observational study of people playing the game.

3.3 Ludic Borders in *Civilization VI*

Sid Meier's Civilization VI is a video game developed by Firaxis Studios released in October 2016. It is the most recent iteration in a series of games that invite players to take on the role of a world leader from history and manage a civilization from the "Ancient Era" to the "Future Era." Gameplay is turn-based and competitive and can be played against artificial intelligences or other human players with anywhere between 2 and 24 players in a single match. During each turn, players make decisions about their civilization's commitment to culture, science, military affairs, agriculture, urban

infrastructure, faith, diplomacy, and more. Player decisions align with real-world political ideologies such as “Monarchy,” “Democracy,” and “Fascism,” and separates on the phases of the game into Western historical eras such as the “Classical Period,” “Industrial Period,” and “Information Age,” encouraging players to think of themselves as replicating the decisions and holding the positions of popular figures from history. Victory in *Civilization VI* is achieved by a single player each match who meets one of several pre-decided victory conditions set forth by the game, such as being the first launch an intergalactic space shuttle or conquering the capital cities of every other player.

Success in *Civilization VI* often requires players make decisions that could conflict with their held beliefs about the world. For example, during the first few turns of the game, the player’s initial city is surrounded by “Barbarian Outposts” which produce units that attack their city, threatening to end the game early on. Players are provided an initial “Scout” unit to explore the surrounding lands, identify areas with barbarians, and locate potential areas for building future cities, as well as a “Warrior” unit for wiping out the “Barbarian Outposts” and defending the city. Immediately *Civilization VI* prompts the player to engage ideologically with imperialism or risk losing the game.

Civilization VI utilizes several game design elements to ease played into diverging from their beliefs while also evoking feelings of excitement and intrigue when experimenting with roles they may find morally wrong. *Civilization VI* uses narration and visual design to reduce the realism experienced by the players and disrupt connections between gameworld occurrences and real-world experiences; playable leaders are written as stereotypes of themselves and illustrated in a stylized aesthetic. In addition, the perspective view of the virtual game board does not depict detailed scenes of human

suffering that would be produced by leading your civilization toward fascism or besieging and razing another player's city to the ground. The consequences of player decisions are abstracted into an interface of numeric values communicating how many points you are away from victory — this is the *playspace* of *Civilization VI* at work. In this way, the initial encounters the player has with the game's aesthetics, design mechanics, and feedback system, do not showcase the reasons underlying the moral qualms players might have with the ideological decisions *Civilization VI* encourages them to make.

Figure 3 - Elizabeth I of England's stylized depiction in Civilization VI

Alternatively, a player could play *Civilization VI* as a world leader that represents their nationality or ethnicity, and only make decisions that reflect their political and moral leanings. Ideologically expressing themselves through their gameplay decisions may make the game more difficult, and the *rulespace* of the game's design draws certain hard lines — players cannot choose to lead their civilization toward a nomadic lifestyle, as it is considered a loss if you control zero cities (there are no moving cities in the game). In

this way, *Civilization VI*'s game design works as hard to encourage experimentation as it does to discourage bringing certain ideological expressions into its gamespace. This is a designed and constructed border space which works to bring in certain identities and beliefs and keep out others. In *Civilization VI*, there is no room for the nomad or the anti-imperialist unless they are willing to leave those aspects of themselves behind or have their stay in *Civilization VI*'s gamespace cut short.

Chapter 4: Designing *Energy CG*

4.1 Introduction to *Energy*

Energy CG (Referred to as simply *Energy* going forward) is a multiplayer card game in which players compete to reach a threshold of accumulated "Energy" by utilizing different environmental resources. Players must choose between available cards categorized as either "Renewable Resource," "Fossil Fuel," "Atomic," or "Policy" in order to be the first to reach the amount of "Energy" required to win. While players generate "Energy" independently from each other by playing cards each turn, they share "Pollution," which is produced whenever a player utilizes a "Fossil Fuel" card and sometimes as a result of "Atomic" cards.

The rarity and value of "Renewable Resource" and "Fossil Fuel" cards in *Energy*'s deck approximate the frequency and efficiency of energy sources in the real-world. "Coal" cards are common but cause significant "Pollution" relative to the "Energy" they produce. "Natural Gas" is rarer but has a better "Pollution" to "Energy" ratio. "Wind" does not produce much "Energy" unless the player uses "Policy" cards to invest in technology.

From a game design standpoint, *Energy* is meant to simulate the political and economic decision-making that occurs in relation to natural resources and national energy policy. Each player can be thought of as a political leader of their respective country making decisions about which infrastructures to invest in and extract energy from natural resources.

Energy simplifies the circumstances of energy policy and environmental issues while working to capture the core elements of the system, such as the underlying

difficulty of the decisions and the consequences and stakes at hand. By doing so, the game creates opportunities to explore "what would you do if you had the power to make the decision," style questions, but in a gamified and competitive context that might distort the extent to which player decisions reflect what they would do in real-world contexts.

4.2 Gameplay of *Energy CG*

The game starts with each player receiving five random cards private to them. After deciding who goes first, they play clockwise, taking one turn at a time. Each player starts their turn by drawing one card from the deck and then choosing to play one card from their hand. The choice they must make is a tough one, boiling down to a selection between "Fossil Fuel" cards, which rapidly propel players to victory but also increase the shared "Pollution" total; "Renewable Resource" cards which provide a slower path to victory but avoid increasing "Pollution"; "Policy" cards, which allow players to alter the rules of the game by temporarily banning certain cards, penalizing players who cause "Pollution", or increasing the value of "Renewable Resource" cards for themselves; and "Atomic" cards, which have a random effect each time, offering a high risk, high reward option. In addition, players can opt to skip their turn by not playing a card, a move that triggers "Carbon Recapture," reducing the shared "Pollution" total.

The shared "Pollution" meter is the core challenge of the game. When "Pollution" reaches 5, 10, and 15 for the first time, the player who caused the group to reach the threshold is required to draw 1, 2 and then 3 "Consequence" cards, respectively. These "Consequence" cards penalize all players in the game and sometimes include additional penalties for the player who was required to draw them. At 20 "Pollution", the game ends

and all players are considered to have lost due to ecological collapse. As a result, if all players recklessly use “Fossil Fuel” cards to rush to victory, no one will win. In addition, players must reach the “Energy” goal with the cards available in the deck without reshuffling. If they cannot reach victory with the limited resources represented by the finite set of cards, then no one wins. The more “Consequence” cards they pull, which often require cards to be discarded or individual players to lose “Energy” they have already gained, the greater the likelihood of all players running out of cards.

“Policy” cards — five different types in total — are a special feature of the game, allowing players to shape how victory is pursued. “Tech Investments” increases the amount of “Energy” an individual player receives from “Renewable Resource” cards. “Fossil Fuel Ban” and “Climate Accord” temporarily prevents players from using “Fossil Fuel” cards or penalizes them when they do. “Economic Sanctions” allows one player to target another player by discarding cards from their hand to reduce the range of decisions available to them — a tactic often used to punish players who have caused significantly higher “Pollution” than others. Finally, the “Energy Alliance” card allows for teams to form among the players, incorporating cooperative elements into the game.

The “Energy Alliance” card introduces several complexities to the game and is a core aspect of the empirical study — participants played one game with and then one game without this card during the research sessions. The “Energy Alliance” card allows a player to use up their turn to propose an Alliance which other players have the option of joining. If they do decide to join, all players in the Alliance share their “Energy” totals as well as the total “Energy” required to win. Meaning that if the win condition is 20 “Energy”, for an Alliance of two players it now becomes 40. As a result, Alliances don’t

help players win faster, they allow players to win together and refocus the challenge from racing against each other to preventing “Pollution” and “Consequence” cards to keep anyone from winning.

4.3 Visual Design of *Energy CG*

The artwork of *Energy* communicates a clear pro-environmental stance that aims to encourage forms of gameplay that minimize environmental destruction. “Renewable Resource” cards are represented by idyllic natural scenes while “Fossil Fuel” cards are illustrated under a red sky and barren earth. The artwork for these cards were illustrated by hand by artist Jacob Colman, who I worked closely with to determine how to visually depict each card. Our intention for the “Renewable Resource” and “Fossil Fuel” cards was to highlight the moral choice present by linking each card to positive or negative visual aesthetics. “Consequence” cards were designed as parallels with real-world events to connect the stakes of the gameworld to real-world circumstances. I hypothesized that

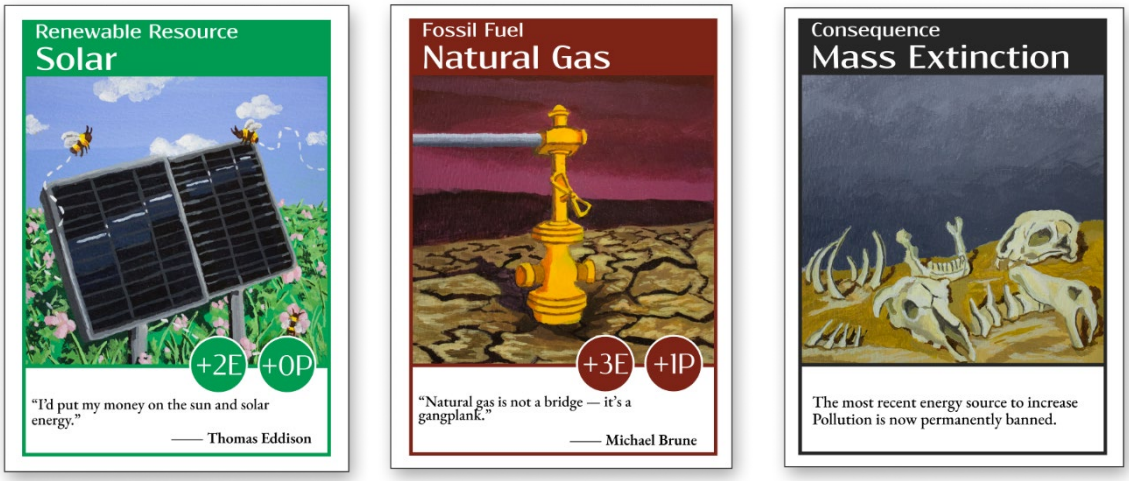

Figure 4 - Visual design of "Solar," "Natural Gas," and "Mass Extinction" cards

this would increase the likelihood that a player’s decisions would be influenced by their viewpoints on real-world environmental challenges.

Jacob and I faced several design challenges in deciding how to present certain cards, notably “Global Protest,” “Nuclear Fission,” “Economic Sanctions,” and “Climate Accord.”

The “Global Protest” card was our first major visual design challenge; we wanted to depict the violence of confrontations between protestors and security forces that illustrated the harm to human life and the destruction of the places where people live. Further, we wanted to position the player in relation to the protest, through a perspective view that places them behind national security forces with the protestors coming directly toward the viewpoint. In *Energy*, the players make decisions as national leaders and the artwork of the card is a reminder of their position in the context of the game — their decisions resulted in pollution levels rising. While these visual aspects were an important element of this card’s design, we were cautious with how much violence to depict as we planned for a general audience. We also did not want to gratuitously depict violence against protestors and activists simply to elicit sympathy. We also chose to abstract the language and use generalized symbols on the protestor’s banners and flags to avoid

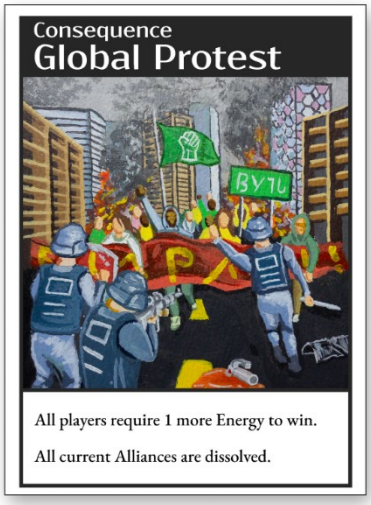

Figure 5 - Visual design of "Global Protest" card

suggesting to the player that the protest was occurring in a particular country, which may have biased their views on its legitimacy or importance.

"Nuclear Fission" offered a different issue: how to reflect the conflicting perspectives on the viability of nuclear energy as an alternative to fossil fuels in our construction of positive imagery for renewable resources and negative imagery for fossil fuels. We debated whether it fell into the positive or neutral category and were hesitant to lean into the high-risk aspect of the visual design out of the desire to avoid being alarmist. We opted toward a more neutral path, using a night scene to add a sense of gravity to playing the card and deployed warning tape to indicate that risk was present.

Figure 6 - Visual design of "Nuclear" card

"Economic Sanctions" and "Climate Accord" presented a similar challenge: how to use illustrations to connect the in-game purpose of these cards to real-world policy decisions without drawing links to specific countries which might bias the player. "Economic Sanctions" uses the familiar color schemes of a globe of Earth but depicts an arrangement of unfamiliar landmasses that do not map to Earth's continents. "Climate Accord" depicts the circle of flags associated with bodies such as the United Nations but

uses solid colors to avoid suggesting the flags represent a specific set of real-world nations. Our approach is not intended to depoliticize *Energy,* but to broaden the political context beyond specific national bodies, conflicts, or relationships.

Figure 7 - Visual design of "Economic Sanctions" and "Climate Accord" cards

We made these visual design choices while conscious of how they contribute to the construction of *Energy*'s ludic borders, with the goal of encouraging players to bring their ideological views into *Energy*'s gamespace, while also working to inform and shape those views after entry.

4.4 *Energy CG* & Mesocosmic Games

In *Playing Nature: Ecology in Video Games*, Alenda Y. Chang offers the idea of the mesocosmic game: a type of game existing, "between field experiments and laboratory conditions, which replicate select aspects of the surrounding world.[38] Chang is interested in game's capacity for representation, particularly in relation to environmental

[38] Alenda Y. Chang, *Playing Nature: Ecology in Video Games*, Electronic Mediations 58 (Minneapolis: University of Minnesota Press, 2019), 19-20.

issues, and how players experience that representation as real or not real. *Energy* operates in this space, adapting and simplifying facets of our present day climate crisis — the distribution of different energy sources, the need for technological investment for renewable resources to rival the output of fossil fuels, and the consequences of failing to address the environmental issues in a timely manner — while working at a scale that encourages players to take their gameworld decisions seriously, while not directly connecting the consequences of their actions to the state of the real-world environment. I find it useful to think of *Energy* as a mesocosmic game in Chang's configuration: that is, a game that offers "an ideal way to characterize the subtle negotiations that take place between human and nonhuman actors and technological assemblages during play, while also taking into account diverse situational and interpretive contexts."[39] Chang highlights the negotiation between the aspects of the real-world carried by the human player and the "nonhuman actors and technological assemblages," which I see as representations of the game designer. This negotiation carries many similarities with the type of negotiations I describe as occurring at the ludic border between the player's real-world identity and the gameworld roles afforded by gamespace. Chang's articulation of the mesocosmic also argues "that games and scientific experimentation are cut from the same cloth," which informs my approach to observing gameplay and using game design for empirical study.[40] I'm interested in this approach both as a way of thinking about experimentation as a modality of gameplay, as well as the orientation of games and game design toward empirical study to broadly consider the influence of play on ideological expression.

[39] Ibid, 20.
[40] Ibid, 20.

Chang offers an interpretation of Bogost that understands the effectiveness of a game's procedural rhetoric as partially dependent on the beliefs and identities the player brings to the game.[41] Chang invokes the language of "transmediality" to assert the ways in which mesocosmic games, through their representations of ecology and the environment, are particularly suited for engaging player's real-world beliefs and interests.[42] *Energy* also draws on Bogost's concept of procedural rhetoric in the ways it makes arguments about how decisions and power are arranged, how environmental issues might and should be approached, and the moral value of certain decisions in relation to energy policy. As players play the game, these arguments emerge as the game rewards or punishes different decisions. Drawing on the constructions of procedural rhetoric and mesocosmic games, I approach *Energy*'s rules as an embodiment and representation of my perspective on the relationship between energy policy and environmental futures that rouses players to express their own ideological perspectives on these issues.

4.5 Locating the Borders of *Energy CG*

Encounters at the border of *Energy* occur as the player first views the game box, cards and other components, and rulebook. Design elements such as the shared "Pollution" meter and collective "Consequence" cards, visual design and artwork, and the possibility for both competition and collaboration through the "Economic Sanctions" and "Energy Alliance" cards, are the primary factors that shape the player's movement through the game's border space from the standpoint of design. During the empirical

[41] Ibid, 65.
[42] Ibid, 66.

study discussed in chapter 5, I observed this encounter occurring in two phases: first, during the initial reading of the rules and glancing at each card; Second, when the actual in-game actions associated with each aspect take place for the first time. These two phases represent the two types of encounters with rules and playfulness that McGonigal outlines, which were discussed in at the beginning of section 3.2.[43] While McGonigal distinguishes between "digital" and "predigital" games, my research suggests that in the case of *Energy*, and likely other tabletop games, the act of playing is vital in terms of in introducing the rules, playfulness, and design of the game to the player, and thereby is part of the gameworld identity formation that occurs when crossing the ludic border. I explore the participants experience with the second phase of crossing the ludic border in section 5.3.

Energy also aligns with the distinction between *rulespace* and *playspace*. The *rulespace* of *Energy* is the restrictions that regulate the cards players have access to and when they can play them, the value and effects assigned to each card, and the point systems of "Energy" and "Pollution" which together structure the win/loss conditions. These restrictions limit the player's range of options during gameplay, forcing them to develop logics of decision-making particular to *Energy*.

The *playspace* of energy constrains the consequences of causing "Pollution" by containing all of the stakes within the game to the gamespace. Reaching 20 "Pollution" and triggering "Ecological Collapse" simply results in losing the game. The "Consequences" cards, caused by reaching certain thresholds of "Pollution," simply result in losing energy or being forced to discard a card from your hand. The

[43] McGonigal, *Reality Is Broken*, 26.

consequences of positive actions, such as performing “Carbon Recapture,” are similarly constrained to gamespace, simply reducing the point value of in-game “Pollution” meter and causing no real-world effect. The playfulness of *Energy* is the total constraining of the consequences of all decisions to the systems of the game.

The overlap of *Energy*’s *rulespace* and *playspace* produces a gamespace and ludic border that allows for a range of ideological expressions within the game and allows for experimentation without overtly encouraging it. I have designed *Energy’s* ludic border to engage positively with pro-environmental beliefs through the visual design of the cards. While fossil fuels are punished with relationship between the “Pollution” mechanic and “Consequence” cards, depending on the other player’s decisions it is still possible to pursue a heavy “Fossil Fuel” path. If only one player uses “Fossil Fuel” cards while everyone else gravitates toward “Renewable Resource” cards, the “Fossil Fuel” player is likely to win. Similarly, if other players try to take responsibility for the “Fossil Fuel” player’s decisions by skipping their turn to reduce “Pollution” through the “Carbon Recapture” mechanic, the “Fossil Fuel” player once again takes the advantage. From a game balance perspective, this is offset through “Policy” cards, but remains an important pathway for certain ideological expression to be preserved during the cross into *Energy*’s gamespace.

Chapter 5: Empirical Study

5.1 Motivation and Research Questions

5.1.1 Overview & Motivation

To better understand and evaluate the presence and influence of ludic borders on decision-making in game worlds, I performed an empirical study using *Energy CG* to compare player's self-reported beliefs about the environment with their in-game decisions. This empirical study was carried out at the University of Maryland College Park (UMD) campus. During each session, participants completed a questionnaire, played two games of *Energy* with each other, completed a second questionnaire after playing, and held a group discussion regarding their experiences playing. Participants were aware of the purposes of the study at the outset and the methods of obtaining data were made transparent.

This empirical study is motivated by two intertwined areas of inquiry. First, the extent to which players express their beliefs about the world when making decisions within a context that signals "game." Second, how game design techniques alter the possibilities of ideological expression within the setting of gamified experiences.

These areas of inquiry emerge from the increasing use of "gamification" as a method of deploying game design techniques into spaces beyond the realms of art and entertainment. As "gamification" includes the use of game mechanics to govern professional and political environments, it has become increasingly urgent for researchers to understand how individuals respond ideologically to the affective space of a game. If the experience of gameplay, or the presence of certain game elements, inhibit, distort, or provoke the expression of an individual's ideological values, then "gamification" carries

significant consequences when implemented in professional, political, or civic spaces. Further, research by game studies scholars such as Mary Flanagan and Ian Bogost suggests that our experiences playing games not only provide a source of entertainment, but also instruct us in social and cultural norms; their work highlights both how individuals play games and the methods used by game designers to construct arguments through their game's systems.[44] If player ideologies are informed by games, I am also interested in the reverse; how players express personal beliefs and their ideologies during gameplay. This research approaches these areas of interest from the perspective of comparing a player's asserted beliefs with their decision-making while playing *Energy*.

I was particularly interested in using a game I designed for this study because it gave me the flexibility to see how slight changes in the design could impact participant responses. Before completing this study, I informally beta tested *Energy* with several groups of people and observed different modalities of play emerging. As I refined the game design throughout the testing period, I noticed changes in the way people were playing and patterns emerging and shifting as new components, such as the artwork and "Energy Alliance" cards, were added in later iterations. By designing my own game, I was able to use a method where participants played two different versions of the game with slight adjustments particularly geared toward my core research questions.

I chose an environmental theme because it is a salient topic in public consciousness that many participants would have existing beliefs about. This increased the likelihood that users would have a strong ideological perspective on the game and therefore have particular beliefs to express. Using a topic that participants felt neutral or

[44] Flanagan, *Critical Play*; Bogost, *Persuasive Games*.

uninformed about risked a lack of real-world beliefs to observe in relation to in-game decisions. Further, the average person does not have the power to influence energy policy at the national scale and *Energy* simulates the set of decisions normally inaccessible to them. Finally, environmental issues are created and solved collectively, which allowed for a game that incorporated both competitive and collaborative aspects, increasing the range of design elements I could observe players interacting with.

I designed *Energy* as a tabletop card game to better observe and encourage player interactions during the research sessions. I believed the physical distance of virtually playing a video game together would be detrimental to the collecting observational data and increase the complexity of the research methodology due to the need for screen recording and webcams to capture both player expressions and gameplay data simultaneously. Further, I believed not being physically present with each other would decrease the likelihood that players would directly respond to each other during gameplay, undermining my ability to assess the impact of collaborative and competitive mechanics in constructing the ludic border. Finally, prototyping and producing several iterations of a card game proved less time consuming than a video game, which was an important factor giving the time constraints of completing this study.

In comparison to a tabletop board game, I do not believe the choice of a tabletop card game would influence the results of the study. While I am considering including a board in future iterations of *Energy*¸ the board primarily serves as an organizing structure for players to quickly communicate game state to each other. The inclusion or removal of a board in *Energy* does not influence the gameplay affordances I consider in this research.

5.1.2 Research Questions

Several core research questions guided the empirical study:

R1 How do game design elements such as visual design and competitive or collaborative mechanics influence the extent to which players express their ideological beliefs during gameplay?

R2 Does familiarity with crossing ludic borders, interpreted as the frequency an individual plays games, influence the extent to which players express their ideological beliefs during gameplay, and if so, how?

R3 Does playing games about a subject matter influence a player's beliefs about the subject?

Question R1 considers how the decisions of the game designer contribute to the construction of the ludic border and its influence on how individuals form identities and express beliefs while playing games. Question R2 examines the role of a player's real-world identities and behaviors on their crossing of the ludic border. Question R3 is situated alongside research that analyzes how games shape and influence a player's beliefs beyond the boundary of the game.

5.2 Methods

5.2.1 Recruitment

Research sessions were open to any adult participants, defined as individuals at least 18 years old, with speaking and writing proficiency in English that were available to come to University of Maryland College Park's (UMD) campus during the research

period. Each session was organized beforehand and held in a private lab space on UMD's campus. I targeted recruitment toward UMD students as well as my personal and professional networks. Sessions were conducted with groups of three to four participants and held for approximately 90 minutes. Groupings of the participants was based on mutual availability.

5.2.2 Participant Profiles

14 individuals participated in the research. Ages ranged from 20 to 55, with a mean of 29 and median of 23. 8 participants identified as female and 6 identified as male. All participants identified the United States as their National origin. Table 1 describes the participant profiles in full.

Table 1 - Participant profiles

Demographic	Response	Percent	Number
Age	18-24	57.1%	8
	25-34	21.4%	3
	35-44	0.0%	0
	45-54	14.3%	2
	55-64	7.1%	1
	65+	0.0%	0
Gender Identity	Female	57.1%	8
	Male	42.9%	6
Education (Highest Degree Obtained)	High School	50.0%	7
	Associates	7.1%	1
	Bachelors	28.6%	4
	Masters	14.3%	2
National Origin	United States	100.0%	14

5.2.3 Procedure Overview

Each research session was conducted on UMD campus with groups of 3-4 participants over the course of approximately 90 minutes. At the beginning of each session, I described the purpose of the research project and outlined the procedure for the session. Each participant completed a written consent form and I responded to any questions or concerns raised about the procedure. I provided a Demographic Questionnaire (Appendix A) which participants completed before being provided the Pregame Questionnaire (Appendix B). After completing the Pregame Questionnaire, participants played two full games of *Energy CG* together while I observed and tracked their gameplay decisions. After completing two games, participants completed a Postgame Questionnaire (Appendix C) and joined with me in a short group discussion about their experiences.

5.2.4 Pregame Questionnaire

The Pregame Questionnaire asked participants about their experiences playing games — how frequently they played games and what types of games they played — as well as their beliefs about energy policy and environmental issues. These questions were asked prior to playing *Energy* to establish how participants thought of themselves before being influenced by the game. In addition, asking participants to articulate their views about the environment and climate change served to surface their beliefs to the forefront of their mind. I chose this method to increase the likelihood that participants would directly consider their beliefs in relation to the game, as opposed to imagining themselves as neutral.

All questions were formatted either as multiple choice or select all that apply style prompts. The questions about environmental beliefs were asked on a five-point scale to increase data consistency. Responses to the Pregame Questionnaire were particularly geared toward discussing Question R2; Participants responses about their beliefs were compared with the gameplay data produced during the Game Sessions to assess the alignment between self-reported beliefs and in-game decisions. In addition, participants responses about their gaming habits were compared with the gap between their beliefs and in-game decisions to assess the extent to which frequent gamers diverged from their beliefs in comparison to non-gamers.

5.2.5 Game Sessions

After individually completing the Pregame Questionnaire, participants were introduced to the rules and gameplay of *Energy*. After outlining the rules of the game, I showed them examples of each card excluding the "Consequence" cards. The viewing of the *Energy*'s visual design began their encounter at the game's ludic border. Cheat sheets were provided to help clarify the rules and I acted as the dealer and answered questions while the participants played.

Each group of participants played two games while I observed and recorded their gameplay. I used a game tracking sheet to record each card played and used 360 cameras to record audio and video data of participant's reactions and conversations throughout the game.

Collaborative game elements acted as a variable to distinguish game 1 and game 2 during each research session. During the first game, the "Energy Alliance" card was

removed from the deck; Ten copies of the "Energy Alliance" card were added in during the second game. Participants were alerted to this change, making it clear that cooperation became a possibility before they started playing the second time.

Observing the Game Sessions provided qualitative data for the discussions of Question R1. I did not reveal the artwork of the "Consequence" cards during the initial explanation of the rules to allow for observation of the participant's candid reactions to this aspect of *Energy*'s visual design when the first "Consequence" occurred as a result of their gameplay decisions. I only included the "Energy Alliance" card in the second game to observe whether participants played differently when collaboration was and was not formally allowed by the game mechanics.

5.2.6 Postgame Questionnaire

After playing the game twice, participants responded to the Postgame Questionnaire which asked about their experiences playing. The Postgame Questionnaire asked if their views on the environment influenced their decisions while playing or if their views had changed as a result of playing *Energy CG*. In addition, the questionnaire asked how participants felt about diverging from their beliefs while playing.

The Postgame Questionnaire contained a mixture of multiple-choice questions with space for participants to write 1-2 sentences to explain their answer. Participants responses provided self-reported data for the discussions of Questions R1, R2, and R3.

5.2.7 Group Discussion

Finally, I held a short group discussion with the participants asking about their motivations for certain actions such as using the "Carbon Recapture" option (skipping their turn), accepting or rejecting "Energy Alliance" proposals from other players, and intentionally pushing the group to a "Pollution" threshold that triggered a "Consequence." Participants responses to my questions and each other supported the discussion of Questions R1 and R2.

5.2.8 Hypotheses

I formulated the following hypothesis to investigate the presence of ludic borders in *Energy CG* and the game design elements and player characteristics that influenced the construction of the border:

- H1 Participants will be more likely to play in pro-environmental ways, regardless of beliefs, after viewing the visual design of the "Consequence" cards.
- H2 Participants who frequently play games of any type will be more likely to diverge from their self-reported beliefs when making in-game decisions.
- H3 Participants will be more likely to diverge from their self-reported beliefs in Game 2 compared to Game 1.
- H4 Participants will report that their real-world beliefs were influenced by playing *Energy*.

I use the phrase "pro-environmental" as a shorthand to refer to participants who responded to the Pregame Questionnaire in ways that asserted an overall belief in climate change, a desire to reduce the use of fossil fuels, and belief in alternative renewable

resources. I determined this stance by calculated the average each participant's responses to Pregame Questionnaire questions 4, 5, 6, 7, and 9. Each question was asked on a 5-point sale with the first response corresponding with a value of 1.0 and the final response corresponding with a value of 5.0. Participants with average between 1.0 to 2.4 were considered "pro-environmental" in the context of this study. Out of 14 participants, 13 averaged between 1.0 to 2.4 and 1 averaged at 2.5 or above. This indicates a selection bias due to convenience sampling that may influence the results of the study. As most participants expressed ideological beliefs that leaned in favor of *Energy*'s arguments about energy policy and environmental issues, their response to the game's ludic borders reflects those perspectives. Players with beliefs in greater conflict with the game they are playing may respond differently in ways not fully represented in this research's findings.

5.3 Results & Discussion of Findings

5.3.1 Duration of Crossing

Observational data from the game sessions suggests that participants adapted to *Energy*'s gamespace over the first few turns of the game, supporting the idea that crossing the ludic border of a game is a process that can last throughout early gameplay as an individual develops an understanding of themselves in relation to the game and other players. During 100% of game sessions, the first card played during Game 1 was always a "Fossil Fuel" card. When asked to reflect on this move, participants noted that they simply played the card that gave them the most "Energy" to start, but once they had to place "Pollution" tokens in the center of the table as a result, they felt the game got more serious. Participants #6 and #7 in Research Session 2 specifically noted that, after

the first few turns of the game, they could see how it reflected real-world systems, which increased the feelings of guilt about straying from their beliefs. Participant #3 in Research Session 1 stated that the extent to which their ideological beliefs influenced their gameplay shifted over the first few turns; they reported an initial decline in the influence of their beliefs as they felt a pro-environmental stance was not conducive to winning, however, they felt guilt about straying from their beliefs rise as the "Pollution" numbers began to rise in game.

5.3.2 Elements of Visual Design

Observed player decisions and reactions after each group drew their first "Consequence" card suggests that the visual design of the "Consequence" cards increased the degree to which players aligned their decisions with their real-world beliefs. In Game 1 of Research Sessions 2, 3, and 4, participants played exclusively "Renewable Resource" and "Policy" cards in the three turns after drawing the first "Consequence" card, which aligned with participants self-reported pro-environmental beliefs. The one exception was a participant that also self-reported uncertainty regarding their belief in climate change and neutrality toward ending dependence on fossil fuels; This was the only participant who averaged above a 2.4 in the "pro-environmental" questions of the Pregame Questionnaire. In Research Session 1, the first "Consequence" card was drawn during the last turn of Game 1 which prevented observation of ensuing player decisions as the game ended.

In two of the four Research Sessions, the artwork of the "Consequence" card was specifically commented on when the card was first drawn. Participants articulated that

they felt upset and guilty about their decisions after seeing them visually reflected in the "Consequence" card.

I interpret the consistency with which player decisions aligned with their beliefs immediately after the first "Consequence" card, along with the expressed sentiments regarding the visual design, as the seriousness of the artwork disrupting the playfulness of the game and drawing out real-world ideological expressions. The moment of viewing the card's illustration of the destruction produced by pollution increased the sense of connection between what was happening in the gameworld and real-world.

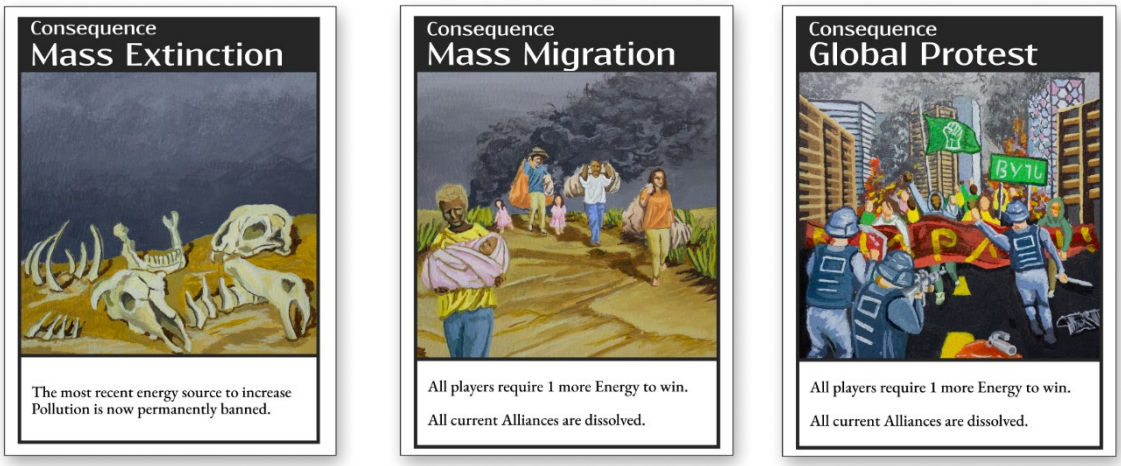

Figure 8 - Examples of "Consequence" card visual design

5.3.3 Responsiveness to Other Players

Participant reflections during the group discussions suggest that the expression of ideological beliefs does not happen independently of other players; Other player's decisions reinforced or disrupted the extent to which each individual aligned their decisions with their beliefs. 10 out of 14 participants (71.4%) directly stated during group discussions that the extent to which their decisions aligned with their beliefs was influenced by the choices of other players (Table 2). The following were common patterns of behavior expressed by participants:

- Feeling bitter and slighted by other players targeting them with “Economic Sanctions” or taking advantage of their “kindness” (interpreted as skipping their turn to reduce “Pollution” and having another player immediately use a “Fossil Fuel” card causing “Pollution to go right back up), as a result they began straying from pro-environmental beliefs and simply played to win
- Feeling that the other players were not working as hard to keep “Pollution” low, as a result they gave up on doing so themselves and departed from their pro-environmental beliefs and simply played to win
- Feeling responsible for other players’ behavior; as a result, they began skipping their turn to counteract the “Pollution” another player was causing
- Feeling frustrated with players who they felt were selfishly increasing “Pollution,” as a result they changed their playstyle to prevent the selfish player from winning
- Feeling peer pressure by other players who played toward pro-environmental beliefs, as a result they began skipping their turn more frequently

Table 2 - Postgame Questionnaire Responses

Postgame Questions	Response	Percent	Number
Influence of personal beliefs (Q1)	Strongly Influenced	28.6%	4
	Influenced	28.6%	4
	Slightly Influenced	7.1%	1
	Did Not Influence	35.6%	5
Different perspective afterwards (Q2)	Yes	64.3%	9
	No	35.6%	5
Decision-making process (Q3)	Played to win	50.0%	7
	Winning + Beliefs	35.6%	5
	Played to beliefs	14.3%	2
Comfort diverging from beliefs (Q4)	Uncomfortable	35.6%	5
	Fun	35.6%	5
	Neutral	28.6%	4

5.3.4 Acclimation to Ludic Borders (Frequency of Crossing)

Participants with greater acclimation to crossing ludic borders showed a greater likelihood to diverge from their beliefs during gameplay. In this context, I define acclimation to crossing ludic borders as the frequency participants self-reported they played games on a 5-point scale. I assessed the extent to which a participant diverged from their self-reported beliefs by performing a correlation analysis between their average "Pollution" per turn and their responses to the question: "Which statement most accurately describes your beliefs regarding the use of fossil fuels?" I compared "Pollution" per turn instead of the number of "Fossil Fuel" cards played to recognize that players may have felt that a card such as "Natural Gas," which only produces 1 "Pollution," is closer to their beliefs than "Coal," which produces 3. However, "Pollution" per turn also includes "Pollution" caused by the negative outcomes of the "Nuclear" card.

When the correlation analysis included all 14 participants, a weak positive correlation coefficient of 0.22 was calculated. However, when the analysis was constrained to participants who reported that they played games daily or weekly, a weak negative correlation coefficient of -0.16 was calculated. When correlating participants who reported playing games less frequently — either monthly, yearly, or never — a stronger correlation coefficient of 0.40 emerges. This data suggests that frequent gamers who are accustomed to crossing ludic borders have greater tendencies to define their gameworld identities in experimental ways that diverge from their real-world beliefs, supporting Hypothesis 2 (H2). In contrast, individuals who less frequently play games are more likely to hold onto their beliefs when they enter gameworlds.

Table 3 - Correlation analysis of participant gaming frequency and average "Pollution" caused per turn

Gaming Frequency	Correlation Coefficient
All	0.22
Daily & Weekly	-0.16
Monthly, Yearly, & Never	0.40

5.3.5 Collaborative Game Elements

Observed changes in participant behavior between Game 1 and Game 2 of each Research Session suggests adding in the "Energy Alliance" card, which formally allowed for cooperative gameplay, influenced the extent to which participants aligned their decisions with their beliefs. Notably, participants increased their use of "Policy" cards over "Energy" generating options such as "Renewable Resource" and "Fossil Fuel" cards. In addition, games lasted longer as players spent more time negotiating relations with each other instead of racing toward victory.

Table 4 - Comparison of Game 1 to Game 2 participant decisions

Decision Type	Game 1	Game 2	Change
Renewable Resource	42%	34%	Decrease
Fossil Fuel	25%	21%	Decrease
Policy	16%	26%	Increase
Atomic	5%	6%	Increase
Skip	12%	14%	Increase
Turns per game	12.3	19.6	Increase

Looking at use of the "Energy Alliance" card in particular, 11 alliances were proposed over the course of 4 games, several resulting in successful collaborations. However, in 0 games were all participants willing to collaborate and 0 alliances won games. I interpret this as suggesting that collaboration influenced player behavior, particularly in the uptick of "Policy" card usage in comparison to "Energy" generating cards, but in despite of the important role of alliances, questions of trust and teamwork prevented cooperation from being the focus. I observed players consistently orienting more strongly toward the competitive elements of the game than the collaborative elements, and desiring victory for victory's sake but only expressing interest in collaboration when it offered a competitive advantage. Put another way, the design of *Energy's* border encouraged players to use collaboration in service to competition.

5.3.6 Influence on Beliefs

Responses to Question 2 of the Postgame Questionnaire suggests that the majority of participants had their real-world beliefs influenced by playing *Energy* (Table 2). In

response to the question: “Did playing *Energy* influence your beliefs about fossil fuels or renewable energy?” 9 out of 14 participants (64.3%) responded in the affirmative. Of the 5 participants who said their beliefs were not influenced, 4 explained that they believed the arguments made by *Energy* were already aligned with their beliefs. The final participant did not share any reflection on why they were not influenced by *Energy*. In consideration of Research Question 3 (R3) and Hypothesis 4 (H4), I interpret this data as strongly suggesting that games have the capacity to influence player’s real-world beliefs.

Chapter 6: Design Recommendations

Based on the observations detailed in chapter 5, I see several design approaches available to game designers wishing to construct ludic borders with particular characteristics. “Serious” and realist aesthetics can lend gravity to the game through connections to real-world people, places, events, or systems. Based on player behavior following the initial “Consequence” card, visual aesthetics are potent material for counteracting the playfulness of reduced consequences. Put another way, “serious” visual aesthetics can increase the likelihood that players will approach in-game decisions as they approach real-life decisions, even if the stakes of the game are constrained to the particular gamespace. In contrast, light-hearted aesthetics that depart from realism can serve to disconnect the consequences of in-game decisions from aspects of a player’s real-life, which can increase the likelihood that players will form experimental identities that depart from their real-world ideologies while playing.

Collaborative and competitive game mechanics can distort player ideological expression. Observational data suggests players are highly responsive to each other and that competitive game mechanics are particularly potent for motivating players toward in-game decisions that provide feedback loops for successfully gaining advantages or achieving victory over other players. The competitive drive can overwhelm ideological belief, leading a player to diverge from their beliefs to pursue victory. Designers should cautiously consider where competition is deployed in their games when desiring players to retain their real-world identities within gamespaces.

Players take time to cross the ludic border and games functionally have a “warm up” phase as players fully pass into gamespace through the comprehension of the rules

and playfulness of the game. I have previously described this as a *character creation phase* and it is an important aspect for *when* a player's real-world identities align or diverge from their in-game decisions occurs. Designers would benefit from thinking of their game as having a beginning phase that makes temporal space for this crossing.

Based on the observations from this study, I made several changes to the design of *Energy CG*. The most significant was a shift in the language and game mechanics of the "Consequence" cards; in the next iteration of *Energy*, these cards were divided between "Global Consequence" and "Local Consequence" cards. "Global Consequence" cards operate similarly to how "Consequence" cards did during the version played for the empirical study. The newly added "Local Consequence" cards have smaller penalties that affect individual players instead of the entire group of players; "Local Consequence" cards are drawn each time a player causes any amount of "Pollution." Beyond increasing the difficulty of the game, this change influences the design of the ludic border by more closely modeling real-world systems as well as producing individual negative feedback loops for players "Pollution" oriented decisions.

In addition, I changed the abilities of the collaborative and competitive cards "Energy Alliance" and "Economic Sanctions" to encourage more intentional use of these game mechanics as players respond to each other's decisions. In the next iteration of *Energy*, the "Energy Alliance" card offers a positive feedback loop by reducing "Pollution" if an alliance is successfully formed and allowing all players who joined the alliance to draw two extra cards. This provides another layer of encouragement for collaborative play, reducing the frequency that the competitive drive overwhelms ideological stances. The "Economic Sanctions" card changes to a stacking effect that

reduces the value of “Fossil Fuel” cards, prevents uses of “Atomic” cards, and prevents the ability to draw new cards as the number of times a player has been “Sanctioned” increases. In addition, players can reduce the stacks of “Sanctioned” on themselves by skipping their turn and using “Carbon Recapture.” This change allows the competitive aspect of “Economic Sanctions” to directly target and punish behavior relating to “Pollution,” as opposed to the general negative effect of having cards discarded. My intention is for this change to discourage players from using “Economic Sanctions” against the player they believe is most likely to win, even if they are doing so through “Renewable Resource” cards.

Chapter 7: Conclusion

7.1 Limitations and Future Research

The primary limitations of this research study are related to the scale of empirical data obtainable in the timeframe of the research. This research was limited by the number of participants and they time able to be allotted for each research session. Without funding to offer compensation for participating in the research and the limited timeframe in which the research was completed, I was only able to recruit 14 participants for 90-minute sessions. This limited the total number of games I was able to observe. In future research with more participants and more time with each group of participants, I would observe participants playing more rounds of *Energy* to examine consistency of results over more games. In addition, I would test how altering design elements besides the additional/removal of the "Energy Alliance" card influenced player behavior. Finally, I would mix up groups of participants to examine how players behaved differently when playing with other groups of people.

As a small-scale study focusing on a single game, more research is needed to support broadly extending the theory of ludic borders. Observational data on games other than *Energy CG* is needed. Future research might consider the differences in how ludic borders are constructed between multiplayer and single-player games, tabletop and video games, and different genres of games. In addition, future research might examine specific examples of "gamification," "gamefulness," and "metaverse" for the presence of ludic borders to assess how well the theory extends to gamified experiences and virtual worlds that are not traditionally considered games.

Expanding the study size should also consider ways to overcome the selection bias present in this study. The research findings of this study may have been influenced by the majority of participants expressing ideological beliefs in alignment with the arguments made by the game's design. The sample of participants in this research study was a result of convenience sampling of university students and individuals in the personal and professional networks of the researcher who were available during the limited time frame during which the research sessions took place. Future research might investigate player responses to games which make ideological arguments they deeply disagree with.

Lastly, future research might more closely relate the theory of ludic borders to research on political and cultural borders. Research on the migration across national borders could meaningfully inform the conception of ludic borders. Further, I am interested in how persistent gamespaces, such as MMORPGs, produce sentiments of belonging that might be related to conceptions of citizenship. Further research is needed to bring literature on political borders, migration, and citizenship to bear on the theory of ludic borders.

7.2 Concluding Comments

In this research study, I have introduced the theory of ludic borders as a lens to examine how the boundary which demarcates gamespace from the real-world is a design product that acts upon the player in particular ways beyond increasing motivation. I have examined how game elements such as visual aesthetics and collaborative mechanics influence the construction of the border, and how characteristics of the player, such as the frequency of which they play games, influences their crossing. Based on observations of

research participants playing *Energy CG*, I have compared the extent to which player's remain true to their ideological beliefs upon entering gamespace to assess the impact of the crossing ludic borders on decision-making. I have observed that both choices by the game designer and characteristics unique to each player are important factors in the degree to which players make decisions that align with their ideological beliefs in gamespace. Based on the observational data gathered in this study, I offer several design recommendations and outline several design changes I made to *Energy CG* to construct a ludic border more aligned with my intentions. In future research, I plan to expand the theory of ludic borders through observational study and game design practices with the intent of assessing the implications of extending game design techniques across professional, political, educational, and social spaces.

Appendix A. Demographic Questionnaire

Participant ID Assigned: _____

Age: _____

Gender Identity: _____

Education (Highest Degree Obtained): _____

National Origin: _____

Appendix B. Pregame Questionnaire

Participant ID Assigned: _____

1. How often do you play games?
    - Several times a day
    - Several times a week
    - Several times a month
    - Several times a year
    - Never

2. Where do you frequently play games? [Check all that apply]
    - Tabletop (Board games, card games)
    - ARG (Alternate Reality Game)
    - Console (Xbox, Playstation, Nintendo)
    - Mobile (iOS, Android)
    - PC (Windows, MacOS)
    - Other

3. What genre of games do you most frequently play? [Check all that apply]
    - Role-playing
    - Shooters
    - Strategy
    - Puzzle
    - Survival & Horror
    - Simulation
    - Sports
    - Party
    - Sandbox

4. How confident are you that there is an ongoing climate crisis?
    - Very confident
    - Slightly Confident
    - Neither confident or unconfident
    - Slightly Unconfident
    - Very Unconfident

5. Which statement most accurately describes your beliefs regarding economic dependence on fossil fuels?
    - I strongly agree that economic dependence on fossil fuels should be reduced

- I agree that economic dependence on fossil fuels should be reduced
- I neither agree nor disagree that economic dependence on fossil fuels should be reduced
- I disagree that economic dependence on fossil fuels should be reduced
- I strongly disagree that economic dependence on fossil fuels should be reduced

6. Which statement most accurately describes your beliefs regarding the pursuit of international agreements to globally transition from fossil fuels to renewable energy?
    - I strongly agree that governments should pursue international agreements to globally transition from fossil fuels to renewable energy
    - I agree that governments should pursue international agreements to globally transition from fossil fuels to renewable energy
    - I neither agree nor disagree that governments should pursue international agreements to globally transition from fossil fuels to renewable energy
    - I disagree that governments should pursue international agreements to globally transition from fossil fuels to renewable energy
    - I strongly disagree that governments should pursue international agreements to globally transition from fossil fuels to renewable energy

7. Which statement most accurately describes your beliefs regarding the use of fossil fuels?
    - I strongly agree that the use of fossil fuels should be ended
    - I agree that the use of fossil fuels should be ended
    - I neither agree nor disagree that the use of fossil fuels should be ended
    - I disagree that the use of fossil fuels should be ended
    - I strongly disagree that the use of fossil fuels should be ended

8. Which statement most accurately describes your beliefs regarding the uses of nuclear energy?
    - I strongly agree that nuclear energy should be utilized
    - I agree that nuclear energy should be utilized
    - I neither agree nor disagree that nuclear energy should be utilized
    - I disagree that nuclear energy should be utilized
    - I strongly disagree that nuclear energy should be utilized

9. Which statement most accurately describes your beliefs regarding the use of renewable resources?
    - I strongly agree that renewable resources are a viable alternative to fossil fuels

- I agree that renewable resources are a viable alternative to fossil fuels
- I neither agree nor disagree that renewable resources are a viable alternative to fossil fuels
- I disagree that renewable resources are a viable alternative to fossil fuels
- I strongly disagree that renewable resources are a viable alternative to fossil fuels

Appendix C. Postgame Questionnaire

Participant ID Assigned: _____

1. To what extent did your personal beliefs about energy resources and the environment influence your gameplay decisions? Please explain in a few sentences:
    - Strongly influenced
    - Influenced
    - Slightly influenced
    - Did not influence

_____

_____

_____

_____

2. Did playing *Energy* influence your beliefs about fossil fuels or renewable energy? Please explain in a few sentences:
    - Yes, I have a different perspective on renewable resources, fossil fuels, and the environment after playing *Energy CG*
    - No, I do not have a different perspective on renewable resources, fossil fuels, and the environment after playing *Energy CG*

_____

_____

_____

_____

3. What best describes your decision making process while playing?

- I played to win
- I played to win, while staying as close to my beliefs as possible
- I played as close to my beliefs as possible

4. What best describes your experience playing in relation to your beliefs about the environment and climate?
    - It was uncomfortable to diverge from my beliefs while playing
    - It was part of the fun of the game to diverge from my beliefs while playing
    - I did not feel any particular way when diverging from my beliefs while playing

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