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### Designing Analog Learning Games: Genre Affordances, Limitations and Multi-Game Approaches


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Designing Analog Learning Games: Genre Affordances, Limitations and Multi-Game Approaches

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## Introduction

The *Lost & Found* games series (2017—present) is a product of iterative design of “games for learning.” The goals of its design are twofold: design gameplay that promotes the teaching of religious legal systems and make that experience an engaging play and learning experience. The authors are professors of game design and development at the Rochester Institute of Technology (RIT). Owen Gottlieb specializes in games, interactive media, and learning and Ian Schreiber is a game designer from industry. This collaborative project involving faculty at RIT and a number of other universities and dozens of graduate and undergraduate students has produced two tabletop games, *Lost & Found* (a strategy game) (Gottlieb & Schreiber, 2017a) and *Lost & Found: Order in the Court—The Party Game* (Gottlieb & Schreiber, 2017b) as well as a digital prototype of the strategy game for the iPhone.

You may be asking, “Why teach games about religious legal systems?” Gottlieb's research and design work includes learning games in the areas of religion and culture, and he set out to develop games that would expand learners' understanding of religion and law. This goal is born out of combination of factors, most prominently, the relationship Gottlieb noticed during research between religious legal systems and game systems—both are rule-based systems. It was also obvious that there is a lack of knowledge in the public about religious legal systems. Though Gottlieb had found Jewish legal systems fascinating in graduate school, he knew that outside of specialized schools, most people knew little about them. At the same time, he watched increasing coverage in the news of “Sharia law” and was dismayed by how little people actually understood about religious legal systems; systems that must be understood in context. For example, few people understand that religious legal systems have been critical throughout history for promoting what evolutionary biologists and

anthropologists call the “prosocial” aspects of religion (Wilson, 2013), such as collaboration and cooperation. Religious legal systems were key for promoting community sustainability and governance, and dealing with tragedy-of-the-commons situations. With the goal of promoting better literacy around these topics, Gottlieb set out to build a team to develop games to address these concerns. Schreiber joined the project soon after Gottlieb arrived at RIT and the two have collaborated closely since.

This essay explores what we discovered about analog games and game design during the many iterative processes that have led to the *Lost & Found* series, and how we found certain constraints and affordances (that which an artifact assists, promotes or allows) provided by the boardgame genre. Some were counter-intuitive. What choices would allow for the modeling of complex systems, such as legal and economic systems? What choices would allow for gameplay within the time of a class-period? What mechanics could promote discussions of tradeoff decisions? If players are expending too much cognition on arithmetic strategizing, could it alter the characteristics of those trade-off discussions? Could the designer devise a game system that promoted consideration not just of the difficult decisions made in a community that has to balance the needs of the community with individualized needs, but could they help find a way for students to discuss legal reasoning as well? The design examples in this essay provide a case study in the exploration of these questions as well as the resulting published games.

#### Game Mechanics, Core Mechanics and Learning Mechanics

We begin with a few definitions of terms used throughout this essay. Game mechanics can be defined in a number of ways; here we refer to an action the player takes that has an effect in the game system. Following Fullerton's definition, core mechanics are “the actions that a player repeats most often while striving to achieve the game's overall goal” (Fullerton

2014, 210). Learning mechanics is a term coined by Plass et al. (2011). Plass and colleagues tie core mechanics to desired learning activities in the following way: “Learning mechanics are patterns of behavior or building blocks of learner interactivity which may be a single action or a set of interrelated actions that form the essential learning activity that is repeated throughout the game” (2011, 4). It is this notion of “essential learning activities” that we concentrate on in our investigations with *Lost & Found* in this essay. Plass and his colleagues further note that designers should ensure that learning mechanics maintain mental effort, but they must not introduce extraneous cognitive load (roughly, how much simultaneous thinking a player has to do) nor unnecessary confounds (such as mechanics in a mathematics game that stresses motor skills over mathematical problem solving). Games and Learning scholars are also aware that games for learning should be wrapped in curriculum such as direct instruction, or discussion to contextualize the gameplay, and reflection of various points of play (see for example, Squire 2010; Bauman & Games 2011). Learning games are to be understood as part of a broader curriculum (Hays 2005; Sitzmann 2011).

Those who are consciously designing game mechanics aligned with essential learning activities have often focused on a disciplinary approach (Barab, Ingram-Goble & Warren 2009). For example, in history games for learning, learners must examine primary sources, hear multiple points of view, and ask challenging questions (Gottlieb 2015, 2016, 2017; Mathews & Squire 2010). In mathematics, learners apply mathematical principles to solving problems, such as in *Noobs vs. Leets* (Plass et al. 2012) in which determining angles in geometrically arranged puzzles helps to free imprisoned allies. In *Environmental Detectives*, learners gather environmental data in the field (Klopfer & Squire 2008).

In the *Lost & Found* series we sought to have players perform trade-off behaviors based on cases generated from cases implied and referenced in religious legal systems, specifically laws relating to torts (damages and liability) regarding lost and found objects. We chose these laws because they include resource management and aspects of cooperative living, suggesting a strong fit with Euro and hobby game mechanics. The games take place in Fustat (Old Cairo) in the 12th Century, where these law codes and texts were written. The look and feel of the games were designed to evoke the cultural milieu of that time. This milieu is important for context as part of curriculum developed for the games. Moore (2014) makes it clear that religion can only be understood in context, and that context is critical for teaching about religion in the public.

#### Drawing Characteristics and Mechanics from Euro and Hobby Game Genres

For designing *Lost & Found*, we were confronted with the tasks of designing a model that would place players in trade-off decision making and provide adequate systems modeling the laws, set in historical and cultural context. Because games in these genres often use resource advancement and resource circulation systems, mechanics for collaboration, historic themes, and time constraints (which would be important for use in a variety of learning environments), we looked to Eurogames (which include games such as *Catan* [Teuber, KOSMOS 1995], *Carcassonne* [Hans im Glück 2000], *Bohnanza* [Rosenberg, Rio Grande Games 1997], and *Puerto Rico* [Seyfarth, Rio Grande Games 2002]) and the broader Hobby Game genres, including other games such as *Cosmic Encounter* (Eberle et al. , Eon Games 1977) and *Pandemic* (Leacock, Z-Man Games 2008).

The term “Eurogame” as understood by Woods refers to a set of generic characteristics found in post-war, non-direct-confrontational German-style tabletop games which blossomed more widely by the early 2000s (Woods 2012, 78—79). We sought to use particular

characteristics for Eurogames, as we knew some would not serve our design goals. We did not restrict ourselves to non-confrontational mechanics, nor did we divorce theme from mechanics, a characteristic which historically, has been common in Eurogames, though there are more recent examples of Eurogames with stronger themes, e.g., Spiel des Jahres nominees *Terraforming Mars* (Fryxelius, FryxGames 2017) and *T.I.M.E. Stories* (Chassenet & Rozoy, Space Cowboys 2016). We designed the events of the game primarily around tort laws, and the win states such that they relate to underlying principles of the laws. We did include certain elements common to the Eurogame genre that we felt would assist in bringing our model to life. These included: resource accumulation, resource management, and distribution systems; the presence of elements of chance that can be mitigated; and constrained play time (Woods, 2012, 108—16). We also drew from the broader category of “hobby games” (Woods's term) or tabletop games—card and boardgames from a variety of genres including the Eurogame. This gave the design team a broad palette of mechanics to choose from, in order to craft the most effective game possible.

Below, we discuss a selection of the characteristics and mechanics that we drew from these tabletop genres in the process of building a playable game model of the legal system.

#### Emphasis on Advancement Over Destruction

Eurogames provide a variety of examples of mechanics and systems for players to deal with different kinds of resource management, be it accumulation, distribution, combination, or other means to strategize and use resources toward goals and win-states (Woods 2012, 84—88).

Players often build toward victory, rather than racing along a track or destroying their opponent's pieces. We felt that players building rather than tearing down was a fitting metaphor for a legal system created for the purpose of allowing families as well as broader society to thrive.

In addition, in Eurogames the primary goal is often layered over a variety of sub-goals with resources, and it is this layering that provides depth of play from a set of relatively simple rules (Woods 2012, 99—102). In *Lost & Found*, while the primary goal is to accumulate resources and use those to fulfill the requirements on responsibility cards, the game has a number of secondary goals, including survival of negative random events, hand management to prevent forced discards of key resource cards, and negotiating with other players.

#### Chance Elements/Imperfect Information

The game state in many Eurogames has imperfect information, and makes use of random elements that are mitigated by player choice (Woods 2012, 110-111). While the game may present some uncertainty that allows for less skilled or younger players to feel they have a chance to win, it also gives the perception of rewarding players for skillful choices. As a game designer, Schreiber suggests that the element of luck may also have a psychological effect, allowing player to blame the random element for their losses while claiming superior skill as the reason for their wins. This element of chance is particularly important given various learning environments, in which the players may have widely varying degrees of skill at tabletop games.

In *Lost & Found*, we gave players a closed hand of cards to allow for concealment of information from one another, and used several decks of shuffled cards as random elements. The mitigation of randomness was controlled through careful balance of player resources: there are just enough resource cards for players to collectively draw the entire deck once, and just enough required costs in the game to absorb the resources. While the order of card drawing varies from game to game, through repeated play a group of players has enough information to work together to meet most or all of their goals if they plan carefully as a functioning team.



### Constrained Play Time

Play time of Eurogames is usually constrained and predictable with a given number of players (Woods 2012, 115), as opposed to many games with wide-open play time (consider, for example the potential length and lack of end-state in a typical *Monopoly* [Magie & Darrow, Parker Brothers 1933] game). In the Eurogame genre, this is a practical consideration for games played by families or other groups that have limited and delineated times for this leisure activity, as the games give some guarantee that they neither end too quickly, requiring the group to find another game to fill out the time, nor continue so long that some players are forced to drop out mid-game (Woods 2012, 62). In the case of *Lost & Found* we were conscious of limiting play time so that the game could be used reliably in settings such as public programs, during class time, or in after-school programs. Constrained play time was an important criterion in the design.

### Collaborative Mechanics, Tightly Wrapped Theme

*Pandemic*, as Rachel Wagner has noted (Wagner 2017), is the closest model for our collaborative mechanics. In *Pandemic*, players work against the game system to defeat spreading plagues. In *Lost & Found*, the collaborative parts of play require players to collectively enhance the community through bringing new structures and skills to the community. Players also must work together to address natural disasters and community crises. Wagner also notes that unlike the Eurogame genres that most often divorce theme and mechanics in favor of abstracted mathematical strategy puzzles (with historical theme as an afterthought or visual aesthetic theme), *Lost & Found* tightly wraps the theme of the laws and the decisions related to the laws with its mechanics. Wagner aligns *Lost & Found* more closely with *Pandemic*, though *Lost & Found* also draws from Eurogame mechanics. By combining these and other mechanics, which

we detail in the following section, we worked to build a playable game which modeled the tensions within the legal cases.

### The Play of *Lost & Found*

In *Lost & Found*, each player takes the role of a family in a small village, and has a personal objective of fulfilling at least three of their own family responsibilities. Meanwhile, the players must also collectively complete at least six communal responsibilities. If the communal responsibilities are not completed by the end of the game, all players lose; otherwise, each player who completed their family responsibilities wins. In this way, any combination of players (including none or all) can win together. Players can thus choose to work together to build an ideal society, or individuals can attempt to secure their own win and let others fend for themselves, or an individual can even go so far as attempting to win solo by sabotaging others (at their own risk); one of the core design features was to showcase cooperative play while still allowing transgressive play, emulating the kinds of choices people make regarding legal systems.

There is a deck of event cards, with one card played on each player's turn. Some events are positive, giving players more resources. Other cards require the players to come together, spending resources or otherwise taking penalties for the greater good, in order to avoid a disastrous effect. Still other cards present ethical dilemmas to one or more players, taken directly from Jewish law (*halacha*); these allow players to choose to break the law for their own personal gain, follow the law even if it is to their detriment, or even go above and beyond the law at greater personal cost. Breaking or transcending the law acts as a reputation system for the game: at the end of the game, players face reckoning for their deeds, which may result in gaining or losing additional family responsibilities, modeling the community discovering theft or appreciating assistance for neighbors.

The event deck also acts as a timer for the game: when the deck runs out of cards, the game ends. In the case of a five-player game (the maximum supported), each player gets a total of six turns, and can only contribute to a single family or communal responsibility each turn. To win, then, a player must spend half their turns completing family responsibilities, and one of the communal responsibilities should be completed every round, on average.

Completing responsibilities requires that players spend resources in the form of *dinarim*, the game's currency. Players draw cards each turn that are worth some amount of *dinarim* each. On each player's turn, after resolving a law-based event, they must decide how to allocate their cards: toward completing a family responsibility for themselves, or a communal responsibility that helps everyone. The game is balanced so that the income players receive from cards is sufficient to meet all responsibilities, if players coordinate together; however, income distribution is random, so some players may get more resources on a given turn while others get fewer.

As an added complication, some of the resource cards are considered lost by someone else, and found by the player who draws them. While a player can use someone else's goods to complete their family responsibilities, this is considered breaking the law (equivalent to stealing). A player is instead legally required to care for the card until they can return it to its owner, but returning it is sometimes impractical or otherwise requires waiting some turns. Meanwhile, a player can only hold a certain number of cards in their hand, and must discard down to their hand size maximum at the end of a turn, making it a (sometimes severe) burden on them to care for lost objects.

When a player completes a family responsibility they are rewarded through additional resource cards or options to use their resources more efficiently. While this is a personal

benefit, players could make the case that this helps them to more effectively help the community on future turns. Communal responsibilities, on the other hand, reward all players: some protect from negative events or reduce the cost of family responsibilities, and all of them reduce the cost of certain other communal responsibilities (allowing the players to “chain” together communal purchases in the proper order for greater resource efficiency, which was influenced by the design of *7 Wonders* [Bauza, Repos Production 2010]).

As such, the primary mechanics featured in this game are a variety of trade-off decisions. Mechanics such as accrual toward a goal (a common trait of Eurogames), resource management (which features prominently in both Eurogames and American-style hobby games), a fixed set of resources and events that are drawn in random order (the presence of randomness mitigated by player planning and skill is a hallmark of Eurogames), and a tragedy-of-the-commons style choice of striking the balance between helping oneself at the expense of the community and *vice versa* (a rarely explored mechanic in tabletop games of any genre, most similar to *Crisis* [Bouboulis & Tsantilas, LudiCreations 2016] which the authors discovered through communications with the editors of this essay). Layered under these are a number of other mechanics: hand management, trading and negotiation with other players, and the bonus chaining and combo mechanics of the responsibility cards (all of which are found in hobby games in general, including Eurogames).

We now turn to the evolution of the game system as it exists in the release version, implications for curriculum development, and the gleanings that have led us to two games with different learning mechanics, both designed to support and be supported by distinct curricula, two games that can also be used in concert.

In Depth: Selection of Key Decisions in the Design of *Lost & Found*

What follows is a case analysis and drill-down on a selection of key design decisions and paths we followed in the development of our model of legal systems in *Lost & Found*. Through illustrating these design paths, we show how we moved from our initial theoretical suppositions through the iterative design process to a functioning game complete with learning mechanics focused on essential learning activities. We then discuss the implications of those decisions for designers approaching generation of learning mechanics, specifically for a game dealing with humanities subject matter, including legal reasoning, history, and ethical debates and decision making.

**Figure 12. A selection of cards from *Lost and Found* (2017).**

[See McFarland & Company, Inc. publication for image]

We conclude with suggestions for a more contextualized understanding of learning mechanics and essential learning activities out of which to design learning mechanics, as well as the kind of curricular considerations that may require to support those mechanics.

### **Early Stage Design of *Lost & Found***

As noted before, the goal of *Lost & Found* is to let players engage with religious laws that help hold society together. Given the importance of curricula mentioned above, it is also critical that learners discuss and reflect upon those game experiences. Our initial approach to the design of the game's core mechanics was to create a game-based model of legal systems that would allow players to make trade-off decisions. Because laws are essentially rules, we theorized they would translate well to mechanics, and the lost and found object laws of Maimonides' *Mishneh Torah* (our initial base text) are succinct, which led us to a resource generation approach. Many laws we studied involve a person's responsibility when finding a lost object or animal, and those items could be considered resources that have value. The initial gameplay, therefore, had a strong element of resource generation and manipulation so that players would appreciate having

resources and feel a real sense of loss if those resources were later taken away through accidental loss.

Because we did not want the game to focus entirely on resources and wealth accumulation, we added a reputation system, in which players did not merely contend with resource management but also their standing within the community. This included both a voting mechanic where players could rank one another (so that a resource-starved player could still do well in the game if they made a lot of allies at the table), as well as a model of the broader community consisting of non-player-controlled characters (NPCs) that would observe and react to player actions that either benefited those players at the expense of the community, or vice versa.

At this point, *Lost & Found* was primarily a heavy resource-management Eurogame, focusing on numeric systems that underlie the laws. Our greatest challenge at this point was determining the victory condition. What did “winning” mean in this context? We knew that wealth accumulation on its own was not sufficient, as the purpose of the laws was not to allow people to achieve wealth.

### **Acts of Meaning**

When the goal of laws is to strike a balance between benefiting the individual and the community, what does it mean for an individual to “win”? Our game design team ultimately came up with the concept that if players are individuals in a village community, winning should involve the players living a meaningful life. This led to a search for sub-goals, or “acts of meaning,” a term coined by team member Alex Lobl, which became the players' victory conditions. These acts of meaning went through several iterations, becoming “Responsibilities” (team member Bruno Rocha's contribution) in the final game. For an extended discussion of this process and Lobl and Rocha's contributions, see Gottlieb (2017).

From this work on win states, it became clear that the most important choices players were making revolved around balancing the needs of the individual with the needs of the community, and “winning” involved striking a proper balance. The ability for learners to articulate that there was a natural tension between individuals and a community arose as another learning goal. The process of designing win-states and determining objectives helped us to articulate and clarify additional learning goals for our players. It also provided a means of linking the thematic content to the resource generation mechanics that were modeling the case law. Players were not simply managing resources, but doing so for a set of values often in tension: the flourishing of family and community.

### **Simplification and Abstraction**

At this point, the game was playable and the win states were well defined. There were multiple overlapping systems, including resource generation of multiple resource types, random events that caused objects to be lost or found, and a reputation and social status system. The complexity in the game was due to the inherent complexity of the underlying legal systems and community dynamics that we were modeling. This presented a problem: the game as originally designed was meant to last 16 turns, and each turn took about 45 minutes, for a total play time of 12 hours! Internal playtests typically only lasted one or two turns and we did not complete a single play-through to the end during this phase of development. Obviously, for a game meant for public play in a variety of environments, this was far too long, and we began the process of simplifying the mechanics. But what was essential and what could be safely removed? Every removal of a mechanic would streamline play, but at the cost of potentially losing elements of what we were trying to teach. There was a natural tension in the design between the desire to make the game more elegant and streamlined, and the desire to create a high-fidelity simulation with deep meaning.

One of the first simplifying breakthroughs the design team implemented was to revamp the resource system. In earlier versions, there were many kinds of resources and resource generators: cows that produced milk that could be processed into cheese, sheep that produced wool that could then be spun into garments, and so on. Family and communal responsibilities required specific resources to complete, which motivated player coordination and heavy trading, but keeping track of these separate resources involved a great deal of extra gameplay complexity and bookkeeping. We then collapsed everything to a single resource of *dinarim*, and gave all resources a cash value as the number of *dinarim* that each was worth. As we would see in future simplifications, this had the property of adding a layer of abstraction to the game (everything is put in terms of a single resource) but at the same time this removed some of the simulation elements (there were still cows that were worth 6 *dinarim* and milk worth 2 *dinarim*, but cows no longer produced milk—there was now no connection between resources). Abstraction was a tradeoff with the benefit of more elegant play and the downside of loss of simulation elements. We felt this was overall a positive change, and continued looking for other places to simplify.

To achieve a better understanding of the game's systems, we created a resource flow diagram, similar to those described by Dormans (2009). Every resource or object in the game was drawn in a rectangle; the rectangles were connected with arrows based on the mechanics that allowed players to convert one type of resource to another. This allowed us to simultaneously see just how complicated the game had become, and also visually identify the gameplay loops by seeing where the arrows created circular paths. This method also allowed for us to tell which resources and mechanics were central to the game (those that had many



connections to other elements of the game) and those that were peripheral (those with only one connection, or none at all).

From this diagramming and analysis, we identified that the core gameplay loop focused on carefully managing and allocating resources that were used to complete family (competitive) and communal (collaborative) responsibilities, which in turn gave the players additional resources. The reputation system and NPCs were entirely different systems with few connections to the central resource management, and were removed from the game entirely. We retained events in the game that posed challenging trade-offs, and in some cases, ethical decisions (family vs. community) based on case law, but we redesigned the events to relate back to the core game loop. After this streamlining exercise, the game's play time was reduced to 90 minutes (and eventually reduced further to about 45 minutes), while still retaining the essential learning activities: challenging trade-off decisions. As we continued working on the game, we still had to be aware of when to add new mechanics to improve or expand the learning potential of the game and when to remove existing mechanics to reduce play time or non-essential complexity. The team members acknowledged during and after this process that resource diagramming was a powerful tool for managing complexity and play time, and one that greatly enhanced our understanding of both the game's systems and the interrelationships between them.

It is often necessary when working with modeling complex systems to have a digestible model that can be used in a variety of learning environments. This is especially true with a game that can be played out-of-the-box as opposed to heavy simulation or partial play of a simulation. Long playtime and high-fidelity complex systems models can take many hours to play. In our case, we required play time under an hour, which mandated the kind of simplification described

above. The trade-offs that the design team faced in this process have implications for the kinds of curricular approaches necessary in the deployment of the game.

### **Evolving Analysis and Observations**

At this point in development we had a playable tabletop game that fit into a reasonable play time period, and one that generated trade off behaviors by the players—interesting decisions that they had to consider such as whether to expend their own resources to follow the law and return lost animals to other players, or whether to break the law and take resources for their own families. Owen Gottlieb and colleague David Simkins turned to external research, conducting observations and semi-structured interviews with a small number of teen players to generate some early stage preliminary social sciences data.

Simkins noted in his analysis of recorded participant observation that the shift from play into discourse for reflection required particular moderation and scaffolding. While some of the discussion by the students included emotional and humorous reactions to losing animals, the discussions did not move into the implications of the law until guided by moderators in reflection discussion. Simkins suggested the opportunity to explore mechanics that moved directly into player discourse (also referred to as “talk-practice”—a term in cultural anthropology for spoken utterances which can be used as evidence) about tradeoffs. In addition, in an external design review at the Games+Learning+Society Conference in 2016, colleague Trent Hergenrader noted how discourse around resource management in Eurogames can center on the verbalization of arithmetic strategizing. Another consultant, Scott Nicholson, suggested how more roleplay-oriented play might change the discourse. Simkins and Gottlieb also noted some of this kind of arithmetic strategizing in talk-practice in the field recordings.

Schreiber and Gottlieb returned to the design studio to analyze these observations and to determine what we could learn about learning mechanics, specifically those used for eliciting

trade off discussions. In managing play time, we noticed that the level of abstraction required also changed the representational nature of play. Players could discuss the value of the objects (in *dinarim*) without always noting the meaning of the object. This was not always the case (for example, with the player who concentrated on the loss of his sheep), but other times, players could converse in the arithmetic of the *dinarim*. It appeared that the abstraction necessary for reduction of playtime may have necessarily downshifted the representational nature of the talk-practice of the players. Salen and Zimmerman describe the “constitutive rules” of a game as the underlying mathematical structures of the game. For example, *Snakes and Ladders* without the illustrations is a grid with numbers instructing movement, determined in concert with the rules (Salen & Zimmerman 2003, 129—133). We hypothesized that the constitutive rules around resource management can also intensify as the systems are further abstracted. This could lead to talk-practice among players that centers on the abstraction—such as discussing the arithmetic calculation to move toward win condition rather than the modeled action of returning someone's object. Again, this can be modulated or interrupted through educator-moderation including reflection as part of the necessary curriculum (it is important to remember, as discussed earlier, that all games for learning require curriculum).

While we had centered on trade off decisions by players, aligning with our essential learning activities, we had concentrated on the legal and communal system modeling rather than the talk-practice generated by those systems and trade-off decisions. This led us to ask the question suggested by Simkins: could we develop mechanics that would move players directly into discourse about the law and its meaning and context? Might the tabletop mechanics themselves have boundaries or limits at which player discourse naturally shifts to abstracted discussion (the “maths”) and away from representational discussion (the “meaning”)? While we

would address this through educator moderation and reflection discussions, this presented an exciting design challenge that would eventually lead to the second game in the series.

#### *Order in the Court: Experiments with Direct-to-Discussion Mechanics*

While we knew we could reach representational-level discussions of trade-offs through moderated reflection, we wondered: might we be able to design mechanics that could avoid the issue of abstraction, developing game mechanics that would immediately launch players into discussions of the reasoning behind the laws? This would move player talk-practice beyond the trade-off decision making in the cases to the meta-stage of understanding why the law may have been written as it was. Such a shift in approach could potentially work in concert with the strategic game, either played independently or in tandem. Could we develop mechanics that could quickly move into the meta-legal while maintaining engrossing play?

This time, we aimed for players to ask questions about the law and its meaning such as “why is the law the way it is?” and “how does the law find a balance between protecting individuals and protecting society?” These questions would likely not have been elicited directly from a systems-based abstraction of the laws. We felt that this was a higher bar for discussions than the kind of reflection on trade off decisions that discussion moderation could elicit, and offered a deeper level of discussion.

The *Mishneh Torah* includes highly specific cases and therefore could often be oriented toward particular cases as illustrative of broader notions and legal concepts, such as preventing undue burden on individuals while demanding individuals be inconvenienced for the betterment of the community. We sought to look to the specificity of these cases to attempt to elicit processes of player reasoning toward the underlying principles. If we did this through storytelling, we could achieve talk-practice on the topic of legal principles.

From these discussions and approaches, we developed a party game called *Order in the Court*, in the style of *Apples to Apples* (Kirby & Osterhaus, Out of the Box Publishing 1999) and *Cards Against Humanity* (Dillon et al. Cards Against Humanity LLC 2011). As with *Lost & Found*, we developed the game over dozens of iterative design, playtest, and analysis cycles. In *Order in the Court*, players take turns as judge, drawing a card with a court ruling or verdict on the front of the card and an explanation on the back. The explanation provides context and meaning to the laws, which can often appear arcane, especially when out of context. We carefully designed the “rulings” to slightly obscure the principles underneath them, enough to provide challenge and afford opportunities for humorous interpretation. The judge reads the ruling (the law from *Mishneh Torah*). Players then draw story cards and compete for the judge's points by constructing a story using their cards to explain how the ruling may have come about. Early stage internal playtesters were immediately engaged in discussion of the possible meanings of the laws. In an early version of the game, we awarded points for both humor (or judge's preference) and also points for the player with the story closest to the explanation provided on the backs of the cards. We had a breakthrough when we removed the second point structure. Players moved more fully into humorous play, yet almost always asked for the explanation afterwards. The removal of points appears to have enhanced player curiosity: following this direct-to-discussion mechanic with no mandate to inquire, players asked to hear the background of the laws. This requires formal investigation to draw conclusions, but points toward an area of research to open.

We are still at early stages of inquiry into *Order in the Court*. It seems clear that *Lost & Found* and *Order in the Court* have different curriculum requirements, with guided discussions in the former to shift discussion to reflection upon the representational aspects of tradeoff

decisions. For the latter game, the curriculum would need to refocus on the specifics of the cultural milieu, as the first game spends more time on fidelity of imagery for architecture, objects, coins, and setting, as well as a variety of communal and family responsibilities, all based in the law. While the illustration and graphic design can do some of that work in *Order in the Court*, the first game may actually be of assistance in setting the geographic and time stage. We intend for our research moving forward with other team members including Simkins to examine interactions with various curriculum choices. We also hope to explore the possible interactions between the two games' systems.

### Conclusion

Through our design work, we came to understand that there were certain aspects of genre restriction regarding player behaviors, prior to curricular or facilitated scaffolding. While games for learning are understood to always require curriculum, the player behaviors without curriculum we believe, allowed us to see tendencies of play that could help in constructing curriculum. One example is where player behaviors would require reflection in order to move from abstraction to depth. In particular, this could be seen in the heavy arithmetical strategizing that can dominate certain resource management mechanics from Euro-style games. While trade-off discussions can still take place, resource management abstractions can lead to more time in discussion on the arithmetical side of the trade-off discussion. With discussion and reflection prompts, the trade-off contexts can be emphasized. Some of the Euro-style conventions are not as bounded as they appear when played without facilitation.

We found that as designers, we were also making trade-offs between what we term high-fidelity modeling of processes and lower-fidelity modeling. Some elements of the high-fidelity modeling included community cooperation in addressing crises, disasters, and the resolution of events of lost and found objects. The higher fidelity model of the strategy game also included

the aesthetic accuracy of objects, garb, and architecture of the time and place. The lower-fidelity model of the party game allowed for fast-to-legal-discourse play, but does not simulate processes of collaboration or event resolution. In the party game, players talk and hypothesize about the law, discussing the law at a meta-level. For the later game, the curricular scaffolding would likely need to provide more detail of the historical and cultural milieu and discussion of the time period.

Just as the strategy game aims for players to have to make trade-offs and often the party game “Explanations” reveal trade-offs in the legal system, we as designers had to make trade-offs. We made trade-offs between mechanics. We made trade-offs in terms of genre conventions.

History and legal systems are complex. Given the need to explore and model complex procedural systems as well as evoke discussion and reflection about the legal processes, we believe that more than one game and set of genre mechanics can allow for that approach. Using more than one game, each complementing the other, and eventually wrapped in a multi-layer curriculum could address a complex layered topic such as 12th century medieval legal systems of North Africa. Coming at the topics from multiple directions with multi-modal game mechanics and genres seems it could provide a pathway to eliciting a broader spectrum of essential learning behaviors. This approach may be most fitting for learning in the humanities. We intend to continue to explore these topics in further research and encourage other designers to consider the possible benefits of the use of more than one game for exploring rich layered subject matter.

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