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# Historical Simulations as Problem Spaces: Criticism and Classroom Use

[Jeremiah McCall](#)

## Part I: Historical Simulations as Problem Spaces: Some Guidelines for Criticism

The concept of **problem space** is a highly useful tool for studying historical simulations, teaching history, and using the former to help in the latter. Simulation games are interpretations of the past designed as problem spaces. In this sense, a historical problem space borrows and extends upon two existing concepts. In the field of educational and cognitive research a [problem space](#) is a mental map of the options one has to try to reach a goal, the various states. There is no implication of physical space. In contrast work by some scholars of video games, most notably [Jenkins and Squire](#), discuss video games as contested spaces: here there are certainly problems, but the space itself (or rather the representation of it) becomes critical. Extending from these established concepts a historical problem space has the following features:

- Players, or in the physical world, agents, with roles and goals generally contextualized in space
- Choices and strategies the players can implement in an effort to achieve their goals

- The outcomes of choices and strategies (especially their success) are shaped by
  - The affordances of the space (which can include quantifiable resources, cultural frameworks, psychological tendencies, etc.)
  - The constraints of the space (which can include finite quantifiable resources and scarcity, cultural frameworks, psychological tendencies, etc.)

That simulation games represent problem-spaces is in some respects just a more sophisticated articulation of the basic core of game-ness. By most definitions games require players, conflict, and a quantifiable outcome. Players have affordances and constraints embodied in rules. What a historical simulation game does beyond this basic game-ness, however, is craft a virtual problem space that represents to some degree a real-world one.

The problem spaces in simulation games are subject to some particular constraints. One of the most important is the constraint of quantification. Simulation game programs, as computer games, must be reducible to 0s and 1s—this is the only language through which a CPU can receive orders. Consequently, all elements of a historical simulation game, including agents and their motives, must be expressible in mathematical terms. My favorite example of this is the happiness metric found in many city-builders.<sup>[1]</sup> This takes a very imprecise real-world concept and transforms it into a precise number that can be increased or decreased in precise ways (often through food, housing, jobs, taxes, and amenities) that have a precise effect on the city population (generally determining whether immigration or abandonment occur).

Happiness, productivity, popular unrest, attack and defense strength, espionage effectiveness, cultural influence—no matter how qualitative the concept in the real-world, if it's an actual mechanic in a game, it is strictly quantified. Additionally, problem spaces in simulation games, however open-ended they might appear, are closed. To function, these games must be working, closed systems, completely operational once the player joins the mix. As expansive as a game might be in its treatments, it will impose arbitrary limits on its subject. These limits begin with the roles and goals of the player, decisions that shape the entire design. Finally, and perhaps more problematically for critical scholars of video games, simulation games are, as games, teleological in their focus. The quantifiable gameplay elements and mechanics all, in a tightly designed game any way, factor directly into whether the player achieves their goals.

There has been excellent discussion on [Play the Past](#) about the appropriateness of, and methods for critiquing simulations historically. Teasing out the ramifications that they are interpretations in the form of quantifiable problem spaces can provide some important insights on this issue. It suggests considerations for rigorous and meaningful criticism that is holistic and sensitive to the medium. First of all, just like any other interpretation of the past, simulation games will select certain aspects of the past as their theme and not others. This is true of all historical interpretations—after all an interpretation that includes everything is not an interpretation at all. To be playable and appealing, a game needs to have a set of core mechanics that are tight and cohesive, modeling one overarching system well. Consider the standard genres of simulation games that have developed over time: city builders, nation management, trade, war, diplomacy, politics, etc. Though there is always room for crossovers and new genres, the existing genres of successful simulation games point to a constraint that a compelling game—just like a focused narrative or analysis—must focus on some things and neglect other things.

Because simulation games must function as a set of working systems, however, the choice of problem space, or more specifically the choice of whose problem spaces to represent necessarily locks the game into certain portrayals of the past. Other media are not subject to the same constraints. One could easily conceive of a textual narrative/analytical work, for example, that devotes time and space to a variety of viewpoints and agencies. Still, no narrative or analysis covers all or even most viewpoints, and all are

subject to authorial predilections. Most importantly when considering the difference between simulations and these media, written texts are not quantitative rule sets executed by a computer to simulate a historical problem space. Even if writers wish to analyze the past in terms of problem spaces, they are free to select a variety of roles and goals that may have at times only tangential relationships. Further, they can select affordances and constraints that do not always form a complete system, and digress on important philosophical and practical comments in ways game designers simply cannot. The game designer must think in terms of a complete, working, simplified system in ways the writer does not. Not that there is anything wrong with this: a goal of most game designers is to entertain and interest players and focused games fare better than those with tacked on elements that do not contribute to the whole.

All this may seem fairly obvious, but there is an important point of criticism here that is not always fully appreciated. When trying to understand why an element of a simulation exists in the way it does and what it suggests about attitudes towards the past—whether why *Colonization* codes native peoples the way it does, why *Civilization* does not deal with social issues in cities, or why *East India Company* does not represent the tensions between English and Indian customs—one needs to consider holistically the problem space selected by the designers.

First off, one must consider the roles and goals of the human players set out by the design plan. Certainly in the real world there can be many agents in a problem space with different roles and goals that complement, conflict, or altogether bypass one another. Simulation games, too, can represent multiple agents with varying roles and goals. In single-player games these additional roles are handled by the program's artificial intelligence routines. In multi-player games human players take on additional roles.

Generally speaking however—and I welcome examples where this is not the case—simulation games, especially pleasurable and/or commercially successful ones must commit to a very small set of roles and goals, often one role and one goal. Even where roles and goals differ and conflict, they tend to be set up as binary opposites or at least draw from the same well of constraints and affordances. So both sides may want to hold a territory or win an election, one group may want independence while the other wants centralization, the city ruler wants profits while the citizens want material niceties, etc. This is in large part, again, because games must be closed functioning systems: each part must connect to every other part. So a game cannot represent roles and goals well that do not fit into the core choices, affordances, and constraints of the chosen problem space. Therefore the commitment to a particular articulation of a problem space will shape every other aspect of the game and any analysis of an element of the game, not least of all an agent, must consider the framework of the problem space.

Let's apply bits of this theory to a concrete example, [Hegemony: Philip of Macedon](#) by Longbow Games, a real time strategy game that combines elements of grand strategy, strategy, operations, and military tactics. The player assumes the role of Philip of Macedon—or more strictly speaking a divinely omniscient version of Philip—the mid-fourth century BCE king of a fragmented collection of Macedonian tribes and cities. The goals of the player are to extend Philip's hegemony, his political and military authority over the territory extending from Illyria in the west, to Thessaly, northern Greece, and the Peloponnesus in the south, to Thrace and Ionia in the east. This is essentially accomplished through a series of military actions with moments of diplomacy scattered in between. The player can levy a variety of historically appropriate units—from phalanxes to peltasts, from light cavalry and heavy cavalry to archers—by selecting a controlled urban center and drawing from that center's population to raise a unit. Each unit has a level of morale, food supply, and initiative, and each unit has different uses in battle. Heavy infantry close into hand-to-hand combat, peltasts throw javelins, yield ground, then regroup for another throw, heavy cavalry mount formidable flank and rear attacks but are overwhelmed when attacking well-formed heavy infantry at the front.

Now, consider the portrayal of slavery in the game. When one defeats an enemy unit, the survivors can

be captured and enslaved. If the survivors are not captured within a short time, they will escape. Slaves can be used to work mines, perform general construction tasks, and transport food supplies. Left untended it is possible for slaves to escape. Now, this is a reasonable sketch of aspects of slavery in the ancient world, not least of all the matter-of-fact nature of a system we find repugnant today. Slaves in the game become a commodity, a valuable source of cheap labor and it is not unreasonable at all for players to initiate battles in the hopes of gaining more slaves for mines and building projects.

Suppose, however, one wanted to criticize formally this historical representation of slaves. One might start by noting that these slaves have very little agency. Granted, they have the goal of escaping in this problem space and can do so if left unattended for too long. This goal does little more than add a constraint to the player's problem space, a reason to take care attending to slaves and spending resources on watchtowers. This is not much of a depiction of agency at all, and slaves become nothing more than affordances, resources for the player to exploit in the game. This sort of portrayal might inspire the comment and critique that even enslaved people had agency beyond escape, the ability to make choices and have a degree of ownership over their lives despite the horrible constraints of their status, as has happened in the historiography of American slavery over the past century. First slaves were not studied, then slaves were studied as victims, whereas more recent scholarship considers slaves as agents while still recognizing their oppression.

Why does the game not portray the agency of slaves? **How Longbow defined the primary problem space, the human player's problem space, is a critical answer.** For the player Philip king of Macedon is the role with a goal of uniting Macedonia and building a Balkan empire. With this role and goal driving the articulation of the problem space, depicting slaves in the game as affordances is fully understandable. One could attempt to flesh out the slaves' feelings about their situation and abilities to act, but it is difficult to see how that would fit into the mechanics of this particular problem space, the one the designers chose.

It is important to note, however, that saying a portrayal of ancient slaves, native Americans, Hessian mercenaries, railroad barons or any other agent or aspect of the past, takes the form it does because of the problem space is not meant to be a tactic for ending discussion or defending an implementation (one could imagine such a chilling effect: "why are they portrayed this way? Because the problem space demanded it. Oh ... okay, so what's for lunch?"). It is meant to focus criticism on a game holistically and consider how the affordances and constraints of the simulation game medium and the interests and goals of a game's creators (their concerns, assumptions, hopes, attitudes, what have you) shape a game's interpretation of the past. At the risk of being too meta, but in all seriousness, one really needs to consider the problem space of the game designers when considering the elements of the simulation they designed. Once the commitment has been made to make a commercial simulation game, as opposed to any other medium, the affordances and constraints of conceptualizing history as problem spaces place great pressure on the final product.

Still, it is not the historian's job to assign blame either. At no point in the process of identifying problems of historical interpretation in a simulation game should the goal be to blame a game designer for somehow failing to get "the facts straight" (whatever that means) or for intentionally misrepresenting the past. These designers have their own goals, and they are generally different from those of the historian. More importantly, intentionally engaging in anything approaching blame locks a historical analysis onto a track of subjectivity that makes it difficult to get any real analytical and explanatory understanding of a situation. Ronald Syme, a master historian of the late Republic and Early Empire once pronounced in reference to Cicero "It is presumptuous to hold judgement over the dead at all, improper to adduce any standard other than those of a man's time, class and station."<sup>[2]</sup> I suggest, as historians, that sentiment also applies to understanding why a historical game takes the form it does. The goal should not be to assign blame but to understand how the past is represented in games that suggest they are about historical

topics and why it is represented in the ways they are. This requires understanding the medium and its constraints and affordances, the audience and its expectations, the designers and their goals, and the ways these and other factors shape how knowledge of the past is transmitted from that past to our living rooms.

So, what kinds of questions might one ask of a simulation game as a problem space and what kinds of meaningful criticisms/evaluations can be made? A few, necessarily incomplete suggestions:

- One might meaningfully question why the particular main roles and goals for the game were selected in the same way one can meaningfully question why certain generations of historians privileged one set of topics and questions over another. Indeed meaningful answers to such questions can be given based on careful research of prevailing ideas at the time. Simulation games, for example, tend to be inclined to issues of domination whether in political, military, or economic forms – discussing why this is continues to be a lively debate.
- One absolutely should question whether the roles and goals selected for the players are historically legitimate. In other words, do they reflect what our evidence suggests were some important roles and goals in the past? There is little question that Philip wanted to dominate the Balkans. In other cases, such as *Colonization* where the goal, as stated on the [Firaxis page](#) is for colonists to “negotiate, trade and fight as they acquire great power” one might very well explore the cases in the past where this articulation of goals was and was not valid. That’s a great conversation to have, and it has great bearing on the validity of each element in the game’s interpretation of the past.
- One can rightfully question why each and every element of the game is portrayed as it is. But these questions should not be divorced from the consideration of the problem space as a whole, especially the historical roles and goals conceptualized by the designers. A thorough critique of why slaves are mere tools in *Hegemony*, happiness is the defining metric for success in *CivCity: Rome*, Indian culture is not represented in *East India Company*, or any other element in any game, should consider the goals set out for the game and the supporting game mechanics to be compelling.

So, suppose that one accepts the roles and goals of a game as historically valid goals, *i.e.* goals that reasonably represent what good evidence suggests motivated some peoples of the past. That might well mean that a thorough challenge to the portrayal of some historical agents in the game could only be made by suggesting:

1. the agents could not reasonably be conceived to play that role in the problem space from the point of view of the player, the primary agent
2. what more legitimate roles the agent could have played in the game that would mesh with the system incorporating the player’s roles and goals in the problem space. Considerations of this sort need to be very aware of the developer’s presumed goal to create a playable, enjoyable, and commercially viable game.
3. (a variant of b) what roles and goals non-player agents in the game could have played that would have worked in a system centered on the player’s role and goals.

So challenging the portrayal of slaves in *Hegemony*, if one accepts the historical validity of the role and goals (which I do), would require suggesting how slaves could have been portrayed more complexly and validly within the defined problem space, how they could have had a greater portrayal of agency through expanded roles and goals.

This certainly can be done. To give an example, consider *Rome: Total War*’s portrayal of the political agents of the Republic and their connection to Roman imperialism. In the main campaign mode, the game begins with the premise that the player is the head of one of three Roman family factions: the Julii, Scipii (*sic*), or Brutii (*sic, not a Roman family name*). As the leader of this faction the player is in charge

of one or two Italian cities, the core of its territory—the game AI operates the other factions. The player can construct buildings in each city that improve its economy, happiness, and growth rate. The player can also construct various buildings in each city that produce military units. These resources facilitate the player's diplomatic and military campaign against the other ancient powers of the Mediterranean. The senate of Rome, a computer controlled agent, also issues missions to the player. When the player successfully completes missions her family's reputation within the senate increases. Failing to complete the senate's missions, may cause the player's family to be branded as rebels and forced into civil war against the Roman senate.

From the initial cut scene in the campaign it is made clear that, ultimately, the player's goal is to take over Rome itself (i.e. take the city and defeat the senatorial faction) and rule the empire singlehandedly. This is a highly problematic and ahistorical representation of Roman families, the Roman senate, and Roman politics in the Republic. The game begins in 270 BCE, the early Republic, but Roman territory is divided into the fiefdoms of the three families. Each family is Roman in name only since they are able to declare war and peace, form treaties, and trade as political entities independent of Rome.

Historically, Roman aristocrats as agents pursued political careers and competed against one another for prestige and power in the name of serving the Republic. Powerful institutions and attitudes regulated the competition for centuries so that no one agent could become too powerful. In the game, however, political offices have no official military and political functions, but are simply awards. The clearly established long-term goal is to overwhelm the Republic.

The critique could continue. It becomes a substantial, holistic criticism when one considers that the game designers clearly intended this to be a game about military strategy and tactics, with some elements of high level diplomacy and management: these are the hallmarks of the *Total War* series. The designers certainly could have kept the player in the role of a Roman military commander bent on campaigning and fighting, and not and not misrepresented Roman politics, politicians, the government, and the senate in this way. By starting the game in the Empire, for example, when it is more reasonable to think of a single political and military head, this portrayal could have been avoided. Or the game designers could have put the player in a vaguer role as one directing the operations of the Roman armies, an elected consul, or even the senate itself.

So one cannot as easily explain the choice of representing Roman politics this way in terms of the demands of the problem space and the historical inaccuracy becomes more striking. It becomes necessary to move outside the game design itself and consider what external factors (modern cultural assumptions and misunderstandings, design deadlines, demands of game-ness) shaped the inaccuracies.

On a final note, I'd simply like to reaffirm that simulation games are human interpretations of the past subject to certain constraints, as sources and media they should be considered holistically, and this can be done by thinking in terms of problem spaces.

## **Part II: Problem Spaces and The History Class**

When it comes to the history class, there is significant educational value to studying the past in terms of historical problem spaces. This is not to say that students should come to view the past exclusively or mostly in terms of problem spaces. It is simply to suggest that problem spaces provide an excellent framework for achieving certain goals in a 21st century history education.

First, consider the extent to which the past can be meaningfully explored in terms of its problem spaces. Albeit with a healthy sense of skepticism and intellectual humility, it is not unreasonable to frame aspects of the past in terms of these features:

- A variety of players with roles: we would term them actors or agents, but the idea of the past being full of people who had choices, made decisions, played roles, and mattered is certainly well within the norm for historical sensibilities.
- Players with goals: This one is a bit trickier. Games clarify goals; life obscures them. Or to look at it another way, goals for real life agents can often be manifold, unclear, conflicting, unreasonable, and unattainable. We must always be aware of that when considering the past as a problem space. That does not mean, however, that the idea of agents with goals is a meaningless simplification. Surely one of the foundations of explaining individual human behavior, if not group behavior, is considering the intentions of actors, and this is based on the recognition that humans do seek goals.
- Players and actions in physical space: One of the points I made in [Gaming the Past](#)<sup>[3]</sup> is that teachers and students too easily and often forget that humans in the past (and present) operated in physical, spatial contexts. Even the most intellectual/emotional/spiritual of goals is embodied in a physical and spatial context. Understanding that context helps understand agents' roles, goals, choices, affordances, and constraints.
- Players with choices and strategies: Granted, philosophers can argue about whether anyone really has any choices whatsoever. Pragmatically speaking, however, historians speak in terms of choice and decisions. Furthermore, we as humans act and comprehend the world in terms of the choices we and others can make (even when we feel victimized and assign all the choice-making to those who seemingly harm us).
- Affordances and constraints: Agents in the past (and present) have opportunities and roadblocks, abundances and scarcities, talents and weaknesses, access and exclusion. These affordances and constraints shape their choices, goals, and roles.
- Spatial context: it is worth repeating. Human motives, goals, and actions are physically contextualized as are many of the affordances and constraints that influence these things. The psychological, the emotional, the spiritual, and the intellectual play critical roles, to be sure. Human goals and actions, however, cannot be severed from their environments and remain fully comprehensible.

An important qualifier. Even when one role and set of goals are the subject of analysis (say Pliny's goal to rehabilitate the financial condition of his province, Bithynia, Pankhurst's goal to gain suffrage for British women, or my goal to say something interesting and useful here for readers) each agent in a problem space will have his/her own goals, choices, etc. To the extent that anyone interpreting the past must select which roles and goals to address, the problem space approach to history is necessarily simplified. But, and this is very important, **so are all other approaches**. Simplifying reality is a necessary part of the process of historical analysis and interpretation.

Why use the idea of problem space as a framework for studying, teaching, and learning about the past? It provides, some useful ways of thinking about the past that can be very helpful to modern students. These are just a few suggestions of possibilities:

- It promotes the agency of humans while recognizing constraints, an important life lesson. One of the goals of history education should be for students to understand how factors shape and promote certain actions and outcomes over others, how everything is hardly ever equal, and how everything is contextualized.
- It teaches to contextualize actions within space rather than divorcing choices from their real-world context. Humans in the past and present do not make decisions in vacuums. Learning to consider the context for decisions and actions before considering the decisions and actions is critical to studying human behavior.
- It fosters flexible problem solving and critical inquiry as students consider why actors made the choices they did, what else they could have chosen, and what the likely results of those other choices might have been (all of which is important counter-factual reasoning). It undermines the

perennial problem of viewing the past as pre-determined. Training flexible problem solvers like this should be a goal high on the list for history teachers. These are the thinkers that can see many sides of a problem, analyze different possibilities, and, hopefully, come up with excellent solutions.

- Related to the previous point, it allows history, as it should, to speak even more to the needs of the present as a place of challenges and opportunities.

Though simulation games are superior tools for studying problem spaces, one certainly can effectively analyze a historical problem space without recourse to actual gameplay. Since I'm new to this practice myself, let me offer a test case from a recent class. I wanted to apply the framework of problem spaces to analyzing the historical evidence for Roman cities and particularly the governorship of Pliny (quick historical background: Pliny was specially appointed to be governor of Bithynia in NW Anatolia by the emperor Trajan in 110 CE. His assignment seems to have been to set affairs in order in the province, which had suffered from financial mismanagement among other things). This was for a pair of ninth grade ancient world history classes at Cincinnati Country Day School. The basic instructional procedure was to assign as homework for a couple of nights notes on a healthy set of the letters Pliny wrote to Trajan while governing the province—these letters are incredibly important for the insights they give into provincial administration in the Empire. The next day I introduced students to the concepts of problem spaces by comparing a problem space to a game (my students were veteran sim players at that point and had played *CivCity: Rome* for several weeks). I stressed that historical problem spaces could be compared to simulation games to make the concept easier to understand but that in no way should we take the baggage of entertainment or triviality often associated with games and apply them to problem spaces. Then I suggested we apply this idea of problem space to Pliny's governorship. The class was divided into groups of 3-5 students and all had access to a digital worksheet with space to make notes on the following: role, goals, geographical setting, types of choices available, affordances (I didn't call them that at first, but got there quickly), and constraints. I indicated I would start the class off by giving some background biographical information on Pliny. Then they would take that information, what they knew about Roman cities from prior readings and what Pliny's testimony suggested to fill out the chart and Pliny's problem space (according to our normal practice, they had to cite the location of the evidence they used for each point).

After more than a decade teaching high school history, here are the features of the exercise that struck me immediately:

- *Comprehension*: even those who sometimes struggled with the challenge of making sense of primary sources and organizing a variety of historical evidence reported their sense that they understood Pliny and his world better than they normally understood many topics we explored. I submit this is because they had to visualize a real world space and fit various components and evidence together into that space. Ideally this is what should happen with historical interpretation all the time, but history teachers well know that this ideal is often not achieved. It is too easy for evidence and facts (such as they are) to get divorced from one another and appear meaningless, particularly when one lacks a deep background in a subject.
- *Engagement*: problem solving is inherently engaging. In the classroom, where problem solvers may be intimidated by concerns of failure, deterred by a lack of interest, etc. the problem solving drive kicks in most readily when the problems are clearly presented, require thought and effort to solve, but are within the reach of students with the resources they have and the scaffolding of the teacher. This exercise fit the bill. I also submit there is something inherently game-like and creative about the whole process of figuring out a problem space because one deals with potentials and options, not fixed outcomes. In a sense, perhaps, it is like creating an avatar in a role-playing game.
- *Usefulness of detail*: This was a big one. I have shied away from providing detail for detail's sake my entire career and, though of course other teachers may not have had this problem, I had yet to find any compelling reason to recite Pliny's political career prior to 110 CE. Until this exercise.

When the goal of students is to reconstruct and fill out a problem space, biographical details that might have been mentioned and lost in other forms of instruction become potentially critical points for establishing a player/agents role and goals. A problem space methodology provides a critical relevance to otherwise less meaningful details, and this kind of relevance is very useful for real learning to take place.

- *Flexibility and Creativity*: Historical imagination requires individuals not only to understand the evidence for what did happen but also to use that evidence to consider what could have happened. To be able to reconstruct a world of possibilities requires creativity and flexibility far beyond that fostered by the rote examination of what did happen and the simple acceptance of standard explanations for why it had to be that way. Again, this is the kind of powerful thinking a 21st century history education should foster: ending not with how things are but considering how they can be.

Hopefully readers will readily draw connections between the use of the problem spaces concept in the history classroom and the problem spaces defined by simulation games. Here, I want to touch very briefly on a key link between simulation game play and the study of problem spaces. Leaving aside for a moment the important cognitive work of critiquing the interpretations of simulation games, what reasonably valid simulation games offer most of all to students of the past is the ability to explore problem spaces from the strategic, if not emotional and intellectual, perspective of a player/agent in the space. Simulation games are particularly good at modeling choice in problem spaces. When students play and critique simulation games, they can actually make choices within a problem space and see how they are resolved. It takes the exercise from the disembodied hypothetical to the virtual, multimedia, personal application – potentially a much closer analogy to the reality of the past problem than regular classroom media. Of course we must be very careful when using simulation games to help students study problem spaces. The games will tend to focus on one set of roles and goals in the problem space and it is essential to remind students that there are many roles and goals. This is the same problem we face, however, with any source, any interpretation of the past. The advantages make the exercise of exploring problem spaces through sim games worth it—but handle the games with care.

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[1] On this point, see my [essay](#), “The Happiness Metric in CivCity: Rome and the Critique of Simulation Games.” ↵

[2] Ronald Syme, *Roman Revolution* Rev. Ed. (Oxford: Oxford University Press, 2002), 146. ↵

[3] Jeremiah McCall, *Gaming the Past: Using Video Games to Teach Secondary History* (New York: Routledge, 2011). ↵

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