For Better or Worse: Game Structure and Mechanics Driving Social Interactions and Isolation

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"Stay Aware of Your Surroundings"

In the game *Pokémon Go*, players are tasked with collecting virtual pets that are tied to real-world locations, inevitably resulting in millions of people going to places and doing things they hadn't done before. When the game first launched in the summer of 2016, the news media had a steady stream of human interest stories to keep them busy. Gamers were flooding public spaces, and counter to stereotype were going outside and being social.

Among the more colorful anecdotes were the two men who walked off a cliff in San Diego, trying to capture rare Pokémonsters. Authorities suspected alcohol was a factor (Kaur, 2016). In Toledo, Ohio, two players broke into the local zoo after hours to grab critters near the tiger cage (Victor & Mester, 2016). In Duvall, Washington, citizens chased creatures near the local police headquarters at night, prompting the police to post on Facebook "We have had some people playing the game behind the PD, in the dark, popping out of bushes, etc. This is high on our list of things that are not cool right now" (Batiot, 2016).

What these stories have in common, besides a slightly Darwinian flavor, is the immense power games can have over human social behaviors. For better or worse, the systems of games incentivize ordinary people to make choices and behave in ways they otherwise wouldn't. Sometimes the result is learning, fun, and community. Sometimes the result is danger and loneliness.

That's the heart of this chapter: good and bad social outcomes are the inevitable consequence of some designs, even when those consequences are unintended. To make this point, the chapter lays out a theoretical groundwork from

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computer-mediated communication and references a series of empirical research examples. I make the case that games have real community effects as the result of what we can call “social architecture.”[1]

I’ll start by making six assumptions and then go on to present a series of supporting examples.

Laying out the Groundwork

Assumption #1. Online communities are real.

There is now a long-standing and broad base of findings demonstrating that the interactions people have online result in real, tangible communities. Moving well past the original aspirational work that argued that an imagined community required only to share identity (Anderson, 1991), researchers in both the qualitative and quantitative traditions have demonstrated at length that game communities are vibrant and real. Ethnographic work has shown that relationships can become deep and be sites of meaning and identity (e.g., Nardi, 2010; Pearce, 2009). Groups form within the formal structures of games (Williams et al., 2006). Survey and experimental work has shown that vast numbers of players meet and form real social ties that move back and forth from the “real” world (Williams, 2006a; Yee, 2006).

Assumption #2. Online systems, including games, have code-based rules that enable and restrict behavior.

This is a deeply (sometimes literally) structuralist argument that may rankle some, especially those who study or focus on human agency. However, the supporting evidence is strong. As we will see throughout this chapter, aggregates of people react predictably to rules. Yes, people have choice and agency, but because of the way systems are created, the only means of exercising their voice (Hirschman, 1970) is often by quitting the system. This structure/agency tension exists in many fields, but in some places, it’s more widely accepted that structures are where researchers should focus. For example, in urban planning and architecture, it’s well understood that the placement of garages and porches and the spacing of sidewalks and parks have a profound impact on community interactions (Caragliu, Bo, & Nijkamp, 2011). It follows that you can take the same people and put them in different neighborhoods and get different levels of community.

In business research, Williamson’s (1994) and Bain’s (1986) industrial organization (IO) model posits that knowing the structure of a system will inevitably explain the conduct of the people in it. Rather than focus on agency, they focus on incentives

[1] Note that programmer Hintjens (2016) uses this term as well, but in a different way. He is referring to the best practices for building an online community independent of social science, as built up by anecdote. The use here is tied to SIDE (Postmes, Spears, & Lea, 2000) and SIP (Walther, 2006) theories, as well as to the experience of game-based practitioners like Kim (2000) and McGonigal (2011).

and rules. For example, when looking at tax evasion, their approach would examine the tax code and wealth distributions to predict how much cheating is likely to occur. This doesn't mean that cheating is good or acceptable in their world view—far from it. It simply means that focusing on the moral choices of the individuals misses the larger structural forces that encourage or discourage that particular behavior. Moreover, if we want the bad behavior to stop, we are better off focusing on the structural issues rather than the story of the individual wrongdoer. In this framework, while individuals may vary, in the aggregate peoples' behavior is predictable when we look at the system's laws and norms.

Lessig's foundational book *Code* (1999) makes the case that the code of a system effectively *is* its law. If a game developer has coded that you can fly, you can fly. If she wrote in that you can't talk to that group over there, you can't talk. According to Lessig, code "will present the greatest threat to both liberal and libertarian ideals, as well as their greatest promise. We can build, or architect, or code cyberspace to protect values that we believe are fundamental. Or we can build, or architect, or code cyberspace to allow those values to disappear. There is no middle ground. There is no choice that does not include some kind of building. Code is never found; it is only ever made, and only ever made by us" (p. 6).

Assumption #3. Developers control that code by virtue of their framing of the world through the lens of the mechanics, dynamics, and aesthetics (MDA) approach (Hunicke, LeBlanc, & Zubek, 2004; Sellers, 2006).
MDA is a design approach that suggests that game "mechanics" create a set of options for a player. Mechanics are the "various actions, behaviors and control mechanisms afforded to the player within a game context" (Hunicke et al., 2004, p. 3). Hunicke et al. give the example of shuffling or betting in card games. If we add or subtract shuffling, we can expect players to behave systematically differently. Another example is the common tank/damage dealer/support class structure found in RPGs. These mechanics create the dynamics within which players act. If the developer decides to change the rules, players will inevitably act differently. For example, if the developer makes support classes more valuable, more players may select them. Conversely, players in now-rarer classes may be more appreciated as they become scarcer.

There's a critical extra component to this assumption about MDA, and it's that developers are explicitly not social scientists. Their goals are usually to create a fun game and/or to make one compelling enough to incent players to spend money to play. Those goals are not particularly in line with or opposed to community outcomes. Community goals are rarely on developers' radar when conceiving, coding, and QA testing a game. Developers, therefore, will code their games with mechanics that may have subtle or massive social effects on the players and will frequently be unaware. Having attended the past 15 years of the Game Developers Conference, it's become clear to me that only a minority of developers are aware of, let alone focused on, the sociological implications of their MDA choices.

Assumption # 4. Some MDA and code choices lead to predictably good social outcomes and some to bad.
There are a handful of consultants and developers who focus on social mechanics. A leader in the space is Amy Jo Kim, who early on wrote the go-to manual for developing smart online communities (Kim, 2000). In her book *Community Building on the Web*, Kim lays out an exhaustive set of criteria for coding up compelling, healthy communities. She draws on dozens of real online community case studies in games and even in e-commerce. Without explicitly meaning to, she is often tapping the same thinking found in foundational work in political economy. For example, Ostrom's Nobel Prize-winning insights on the nature of trust in communities (Ostrom & Hess, 2007) may as well have been baked into Kim's advice to developers. After studying a lifetime of successful and failing communities around the world, Ostrom laid out a set of eight criteria found in every strong community. One of those criteria is that successful communities regularly have means of resolving conflict that are cheap and easy to access. When they don't, members suffer. Listing out all of Kim and Ostrom's suggestions is beyond the scope of this short chapter, but they are highly recommended for developers and for researchers looking for mechanics and criteria that will predict community levels.

Assumption #5. Computer-mediated communication theories and findings are consistent with structuralist frameworks.
Although there are dozens of theories that describe the behaviors of humans interacting in electronic environments, none have been so consistently supported as the social identity model of deindividuation effects (SIDE) theory (Postmes et al., 2000). This theory suggests that individuals entering a system are unsure of how to behave and readily take their cues from external sources. Arriving at a party, we look to others to see how we should behave. Is it a quiet, reserved affair or a loud dance rave? We will likely follow suit with the crowd rather than choose based on our own mood. According to SIDE, the fewer cues we have, the more we'll rely on what few we're given. And, according to Postmes et al., the online world is typically cue-scarce. Compared to the party, we are usually missing the cues of dress, body language, sound, and smell. This leads us to rely heavily on the system's cues to figure out how we should behave. One of the more extreme applications of this general idea is Yee and Bailenson's "Proteus effect," (2007) which suggests that in online games and virtual spaces, we will flow into the shape and identity we're given. If we are playing a tall character, we're more likely to act confidently, reflecting our impression of the social power of height in the real world. Consistent with this, others have found that color or group associations will shape players' behaviors (Pena, Hancock, & Merola, 2009).

Assumption #6. Individual-level social outcome measures are a good way to track these processes.
Evaluating any system requires a well-theorized set of metrics or variables. Evaluating the impact of mechanics on social outcomes means we should use measures that get at an individual's costs and benefits, but within a larger social context. In particular, when looking at the positive or negative impacts of game play, social

capital is an appropriate framework. Social capital (Coleman, 1988) is made up of the emotional and practical resources we draw from interactions with others. As extended by Putnam (2000) and codified into scales by Williams (2006b), it's broken into two related pieces: exposure to new ideas, people, and resources (bridging social capital) and deep social and emotional support (bonding social capital). Research on multiplayer gaming has tended to find that games are better at providing bridging social capital than bonding, though bonding can increase over time (Williams, 2006a).

Assumption #7. The combination of all of these building blocks is social architecture.
Collectively, the design and system code that shapes player behaviors—filtered through our human social psychology—can be thought of as "social architecture." "Architecture" conveys the potential for purposeful creation and construction. The architect builds a house and may or may not understand the full impact, but there is no question that there is a cause and effect. Obviously, architectures that generate higher levels of social capital, community, or positive well-being are normatively better than those that depress those things or even cause harm.

As an example, I was involved in an experimental project with MMO players to test the social impact of voice communications versus text-only chat (Williams, Caplan, & Xiong, 2007). In a controlled experiment of raiding guilds, we compared several text-only guilds to another set to whom we gave headset mics and free software to talk to each other. The text-only groups had drops in their social capital outcomes, whereas the voice-enabled players were insulated from the drops. The social architecture had a direct and large effect on the social outcomes.

The larger implication of architectures is that in the hands of highly aware developers, it is a tool of immense power and even control. In the hands of unaware developers, it's just as powerful, but rather than being a tool of control, it simply generates unintended consequences. Those consequences include social and financial outcomes for both players and developers (good and bad). The next step for researchers is to establish that this is happening regularly and then to gain an understanding of what kinds of architectures tend to lead to what kind of social outcomes.

Meta–Level Analysis

Analytics companies are now consuming and processing vast amounts of game telemetry data, typically to improve the marketing spend of developers, especially in the mobile and free-to-play sectors. One company, Ninja Metrics,[2] specializes in social data and has presented meta-level findings that speak directly to the question of whether game mechanics impact community outcomes. In a series of presentations at Game Developers Conferences (Williams, 2015, 2016), I have outlined the

[2] I am the lead data scientist and founder of the company.

measurement and results from an analytics system I designed to examine player networks. Data are ingested into a cloud-based system called Katana, which first assembles networks from log data. For example, if players A and B are in a group, or chat, a network edge can be drawn between them. With all such edges, the entire community graph can be drawn and then tracked over time. The Katana system generates a metric called "Social Value," which measures the impact of one player on her network neighbors (*Social Value: Finding the true influencers in social games and mobile apps*, 2013). By following behaviors over time, it tracks whether player A's actions are causing some of player B's actions. For example, when player A is present, player B may play longer than when she is not present. The metric of Social Value credits some of player B's behaviors to player A. Then, examining the entire roster of players, some can be seen to be more influential and some to be more followers. As I reported at GDC, the metric has been validated with nearly one billion player accounts and found to be 85% accurate across more than 20 game titles.[3]

The meta-level implication of this metric is that all of the Social Value can be aggregated for a title and compared to the Asocial Values of the same population. In other words, if we look at all of the individuals' playtime and compare the purely socially driven with the rest, we'll know how much play overall is the result of community rather than noncommunity forces. For example, if a game has 30% Social Value and 70% Asocial Value, it means that overall 30% of the play is driven by community and social forces, while 70% is driven by other forces—presumably the game play and marketing.

I have presented a compiled version of the meta-level results as broken down by four large comparative categories: mobile single player, mobile casual, PC hardcore multiplayer, and MMOs. These four categories range from low to high on their social architectures. For example, the single-player titles have no interactions within the game, and so any social element is relegated to out-of-game interactions such as personal conversations or Facebook posting. On the other end of the spectrum, MMOs are the most heavily socially architected with deep player group mechanics and interdependence; players progress faster with others compared to staying solo. The hypothesis was therefore that as we move from the asocial to the more social, we should see the percentage of social play increase, which is indeed what the data show (Table 1).

Given that this is the compilation of more than ten games, but not hundreds, it is a decent early meta-level indicator that game mechanics indeed have a direct and systematic impact on community and social outcomes. It also suggests that systems with more social architectures lead to higher levels of social play. And, those systems with lesser architectures lead to lower levels of social play. If we equate social

[3] Accuracy was measured by comparing the prediction of influence with the downstream actual influence. For example, if player A is forecasted to cause player B to play for an extra 10 min, player B's behavior can be checked. To address the lack of control condition, the more stringent test was applied: cases where player A quits the game were examined. In these cases, player B's play should be *reduced* by that same 10 min. Comparing those predictions versus actuals yielded the 85% accuracy rate.

Table 1 The percentage of social play across different genres and platforms

Category	Meta-level percentage of social play
Mobile single player	6
Mobile casual	28
PC hardcore multiplayer	30
MMO	60

play with positive outcomes, then we have a recipe for which kinds of games are potentially good and bad for social outcomes. Of course, this is not bulletproof causality; there is always the potential confound that perhaps more social players will self-select into more social titles. However, even in large-scale MMO research, the consistent finding is that the systems tend to amplify existing personality types, with extraverts faring well and introverts faring comparatively poorly (Caplan, Williams, & Yee, 2009). The as-yet unanswered question is whether those same introverts would fare *even worse* if placed in games lower on the social spectrum above. What's becoming increasingly clear, though, is that the systems drive behaviors, as the following example shows.

It's the Economy, Stupid

Game economists have taken the precepts of regular economics—markets, price indices, rational choice models, etc.—and applied them to game worlds (Lehdonvirta & Castronova, 2014). They find that players generally do the thing that is in their best interest, whether that's choosing the more fun choice, avoiding drudgery, or buying the less expensive version of two equal things. I was part of the first test of this idea in game research (Castronova et al., 2009), and it was foundational in driving me toward a structuralist approach.

In the study, we'd been given access to player logs of *EverQuest 2*. To my knowledge, this was the first time researchers were able to peer behind the curtain and get truly unobtrusive data directly from a developer. We had both survey data on the players and matching behavioral logs for 9 months of play. That means we saw every action, interaction, and transaction in that time period. Like many MMOs, *EverQuest 2* is "sharded," meaning that when one copy of the game world gets too populated, the developers simply create a copy and flow players into it. That sharding process happened to occur in our study window, allowing us to model a unique natural experiment. We'd started by measuring all of the macroeconomic indicators for our server, including market baskets, inflation rates, etc., and then suddenly, an entirely new and empty version of the game appeared. This is roughly the equivalent of studying the USA, and then suddenly a copy of the USA appears floating in the Pacific, with free instant teleportation to it for anyone who wants to relocate.

What this enabled was a natural experiment and a pure test of the structuralist approach. Were the players in our game server unique and local, or were their outcomes utterly predictable given the game's social architecture? Would players leaving our copy and combining with new players in the empty version establish their own unique patterns or perfectly copy the existing ones? We found the latter (Castronova et al., 2009). After an initial period of people joining, all of the indicators approached and then matched all of the first server's numbers. In other words, the structure leads directly to a predicted series of behaviors, which generated a predicted series of outcomes. As someone who likes human agency, I'll share that this was unsettling. I like to think of myself as a unique snowflake. And well, we all are, but we also gather into uniform snowbanks given a set of rules and an architecture. What's more unsettling is that these effects may be happening by accident.

Unintended Consequences

With a few notable exceptions, developers are—generally speaking—not aces at social science. At their most unaware, they create social systems with unintended outcomes. Two of the more celebrated misfires occurred in multiplayer games.

As detailed by a now-famous story by Dibbell (2001), the early MUD *LambdaMOO* was a pioneering game bringing together players from all over the world into a text-only "space." The code of *LambdaMOO* allowed immense player creativity and control, with the ability to change their surroundings, their abilities, and even some of the rules of interactions. It was extremely open social architecture, but like any text-only system, it was relatively low on social cues. One player known as Mr. Bungle used this open system to perpetrate the equivalent of a violent virtual rape of another player. This action caused widespread anger and anxiety across the community, in addition to the trauma inflicted on the victim. This was clearly not the intent of the system's designers, who struggled with their positions of authority. Bouncing back and forth between the extremes of total fascistic control or total anarchy, the developers were a microcosm of the challenges faced by all game makers. They just wanted to make a fun game, yet found themselves in the role of the state, with all of its responsibilities and consequences. I've often analogized game developers as wardens of a game park, just without any zoology training. It's simply not their area of interest. Ultimately, these developers chose the control route and unilaterally banished the offending player. It's one of the more blunt examples of Lessig's "code is law" statement—the player simply ceased to exist.

In the second instance, Blizzard Entertainment, creators of *World of Warcraft*, accidentally unleashed a killer plague on their population (Coppola, 2007). Players encountering a particular boss had to use its virus against it while staying alive and curing each other. However, the developers forgot to limit where this virus could function. As a result, players teleporting into the game's major cities discovered that they were fatally infecting the other players. Most were doing so gleefully, chasing others around. Although most players found the inconvenience minor and the incident funny, it certainly wasn't what the developers had in mind. It was a reminder of how powerful a game's code can be, even when the designer didn't intend it.

Last Thoughts

Architectures can be positive or negative and can be tools of control or liberating and socially enabling. On the positive side, we have designers like McGonigal, who see the immense potential for growth and happiness. "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. . .to be happy, resilient, creative—and empower us to change the world in meaningful ways" (McGonigal, 2011, p. 14). On the negative side, Lessig warns us of the kind of futures that are possible as dystopic science fiction becomes everyday fact: "Each new generation of system code would increase the power of government. Our digital selves—and increasingly, our physical selves—would live in a world of perfect regulation, and the architecture of this distributed computing—what we today call the Internet and its successors—would make that regulatory perfection possible" (Lessig, 1999, p. xiii). That's only one flavor of negative. Many others have written about the potential for addiction and loneliness in games where the designer certainly would have preferred positive outcomes (e.g., Elson & Breuer, 2014; Griffiths, 2014).

It's therefore up to us, those few nerds, students, researchers, and developers weird enough to read books and chapters like this. We need to build up an understanding of the implications of code and social architectures. We need to communicate them, translated from our researcher geek argot of p-values and Neomarxism into something every day, simple and direct. What we cannot do is simply sit back and assume that games are good for us, or bad for us. They are not natural or inevitable. They are the direct result of choices. Assuming they are "just there" is a path for talking heads and reactionary politicians. Our job as citizens, scientists, and players is to be honest and unmerciful as we analyze systems, laying out which enable and harm communities and individuals. It may be fun and games, but it's also critical media literacy with policy implications. Without solid research and advocacy, there will be only luck and the profit motive guiding the social outcomes of the literally billions of humans who are spending increasingly large parts of their lives in games.

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