Introduction

Multiplayer games can help build a player’s social support network. What would game design look like if our goals included reducing loneliness, decreasing toxicity and boosting a player’s positive connections with others? This paper looks at how we might use economics, an often dehumanizing and antisocial discipline, to support prosocial design goals.

What’s at stake

A multiplayer game can impact our player’s social health. By designing poorly, we can do great harm. The two most likely negative outcomes are loneliness and toxicity.

The loneliness epidemic

Loneliness is a significantly studied phenomenon in medical and psychological literature. It is a kind of social pain that is known to have physical, emotional, and mental consequences under prolonged exposure. Loneliness has been medically associated with all-cause mortality, depression, and more. In aggregate, chronic loneliness is estimated to shorten lifespan by an average of 15 years.

Loneliness causes stress in humans broadly, relating to feelings of vulnerability, and can also provoke scarcity mindset, in which a host of negative outcomes occur. Scarcity mindset is a stress-induced “tunnel visioned” state that causes short term thinking associated with long term net negative outcomes.

There is some evidence that heavy game use is significantly positively correlated with loneliness in youth, though further study on this subject specifically is needed. Increasing research is also showing the connection between heavy smartphone use and loneliness and social isolation. When we combine the...
known severity of the consequences of loneliness with the connections shown between games, technology, and loneliness, it becomes clear that this is a pressing issue worthy of careful consideration and problem solving.

Further amplifying the urgency of this problem is that increasing life expectancy is exacerbating loneliness. In a dark reinforcing loop, advancing age makes us more likely to be lonely, while it is known that loneliness poses particular health risks to the elderly. As the median age of the world population increases, so too will the seriousness of the loneliness epidemic. There’s an opportunity to be seized as ever increasing numbers of older people play games.

As is further explored in our appendix “Towards an action-based framework for mitigating loneliness”, we can rely on the heavily validated UCLA Loneliness Scale to provide a baseline measure for what we mean by loneliness (see more in appendix subsection “defining loneliness”).

Toxicity

It is a truism that people are mean to one another on the internet. There’s a growing recognition that toxicity in an online community stems in large part from weak social design combined with weak enforcement of positive social norms.

At the root of much toxicity is the misdirection of our human need to belong. When humans lack membership in healthy, eudaimonic organizations, they experience stress and seek to rapidly remedy the situation, often in long-term sub-optimal ways. They may fearfully lash out at others, imagining that putting others down helps them rise in status. They join tribal groups who use their shared pain to wreak havoc in the world in an attempt to control their feelings of fear and loneliness. Being a troll can fill an absence of purpose (as we will describe below, purpose is a core component of conquering loneliness) and this feels better to many than the isolation of not belonging. Toxicity is a rational (though naive and self-defeating) short-term strategy that emerges in the face a lack of human connection.

We often think of toxicity as bad people taking advantage of a poorly hardened design. (There is a small amount of truth to this theory; a tiny percentage of players are sociopaths.) As a result, we attempt to treat the symptoms of trolling and griefing with ever-increasing moderation or community management.

However, we are learning that a badly designed social system actively generates toxicity, often at a rate that will inevitably overwhelm the human resources aimed at controlling it. The systems can inadvertently isolate people in closed-off loops where their fundamental social needs are ignored. In toxic systems every new user is potentially rewarded if they adopt toxic behaviors.

Increasing social support networks as an overall solution

The broad solution to the bulk of both of these issues is to design systems that build relationships between players: preventing fire, rather than creating fire which must then be fought. If people are thriving, with strong social support networks, shared goals, and opportunities to grow, they’ll be less lonely. And they’ll be less likely to act out in toxic ways.

The grand project of prosocial game design

There are numerous pitfalls facing designers who seek to increase their players’ social capital. These are organized into at least three major categories.

- **Psychology**: Humans require a series of well-documented steps in order to build friendships. You need the right sized groups of people, in correct density environments, engaged in mutually dependent reciprocal activities. If these psychological requirements are not met, players will always
fail to form relationships. This topic is covered in detail in the 2016 Project Horseshoe report “Game design patterns that facilitate strangers becoming ‘friends’”.

- **Logistics:** Human beings have rigid limits on how many relationships they can maintain and how long it takes them to form new ones. When we try to put players together into groups online, there arise numerous logistical challenges in satisfying all the spatial, temporal and psychological constraints. This topic is covered in detail in 2018 Project Horseshoe report “Design Practices for Human Scale Online Games”.

- **Economics:** Online games are built upon an economic foundation of resources: their creation, transformation, trade and consumption. Almost all social systems interact with these economic systems. However, common economic practices (and their underlying theory) often unintentionally incentivize asocial or antisocial behavior. In particular, many of the key elements required by the psychological and logistical aspects of friendship formation are systematically undervalued within common economic practices.

### Prosocial economics

This paper focuses on the final category: economic aspects of prosocial game design. We’ll cover the following topics:

1. The fundamental need for economic systems when designing multiplayer games;
2. The challenges inherent in applying economic theory to prosocial systems;
3. An approach to using economics by first defining prosocial values and goals;
4. Prosocial economic design patterns;
5. Dark patterns of economic design that sabotage prosocial systems.

### Part 1: Economics & Games

#### Game designs always have an economy

When folks who have taken a course in micro or macro-economics think of economic design in a multiplayer game, they immediately imagine things like supply and demand, auction houses or player-to-player trade. And these are indeed classic economic systems. However, game design uses the term ‘economics’ in the broadest sense of the flow and transformation of resources, value, and incentives for player behavior.

First let’s discuss how game designers treat their economies, and then we’ll get into what we can learn from the study of economics.

#### A game designer’s definition of game economics

Almost all game systems that manipulate player incentives, acquisition of resources, or use of those resources, can be examined with an economic lens.

The practical version tends to take the shape of something similar to Joris Dorman’s definition of an ‘internal economy’.

#### The internal economy

When we build a game, we create a cartoon world that players agree to mostly operate within. Nothing
within the cartoon world is real but we can still build meaningful relationships between virtual objects that give players an interesting system to manipulate.

The economic operations involving the creation and manipulation of endogenous value in the cartoon world are known as the internal economy.

**Boundary between the real world and the game world**

There's limited permeability of the boundary between the real world and the cartoon world. You can think of this as the designer writing out the import / export laws for their bubble of play. For example:

- A designer might specify that you add virtual resources to the game by spending real world currency.
- Or they can specify a time-based limit to the rate at which progress tokens can be earned.
- Or players might go outside the official rules of how to play the game and share tips and spoilers that they did not earn directly inside the game. They might find ways of transacting in real world currency for in-game goods against the developer’s policy. There is always a black market.

**Elements of the internal economy**

We have a variety of economic elements within a game. Many of these come to us via computer science and systems theory, not directly from traditional economics. They were subsequently adopted by game developers looking to name the nuts and bolts of game development they’d been refining for decades.

- **Tokens**: Within this world, there are tokens that act as goods, products, or currencies. A token can measure or quantify almost anything, including abstract concepts such as attention, time or value. Properties of tokens can themselves become tokens (it’s tokens all the way down).
- **Sources**: There are operations within the world that produce new tokens, sometimes connected to resource sinks.
- **Pools**: There are pools that store quantities and types of tokens.
- **Sinks**: There are operations, usually connected to locations or objects, that take tokens out of circulation.
- **Transforms**: Some operations transform tokens in number or type.

Then there are agents who operate mechanisms made out of these elements.

- **Players**: Human agents who have various permissions for triggering different transforms, sources and sinks.
- **Black box**: Computer agents or systems which also trigger various transforms, sources and sinks. Often the player’s job is to understand the systems of cause and effect hidden inside the black box.

With this relatively simplistic set of building blocks, a designer can model most economic flows within a game. This includes complex or emergent phenomena like various feedback loops, ownership (just another property of a token), or trade.

**Economics drive game balancing**

In additional to being the structural foundation that all systems design in a game rests upon, economics also impact player behavior via incentive structures.

- We can ask questions such as: why does a player want a particular weapon in the game?
- And then we can instrument and trace the flow of resources in the game.
- And formulate a theory that the weapon has a utilitarian value in helping the player accomplish some other goal, such as killing a key boss.
• And decide if the boss killing isn’t happening as frequently as we want, and so choose to make the weapon drop slightly more frequently.

This flow exemplifies classic metrics-based game balancing. And it is nearly impossible to do efficiently without spreadsheets and graphs tracking all the relationships of elements within the internal economy.

**Economic systems are everywhere in games**

Once you start looking, you’ll see economic systems everywhere. Consider the following common game system through the lens of game economics:

- **Leveling systems**: XP points are tokens that emerge from the source of killing enemies and are in turn transformed into various skill tokens once they accumulate to a level cap in the leveling pool.
- **Items**: A weapon is a token that enables the player agent to perform various transforms on the pool of enemy health tokens in order to generate XP tokens they own.
- **Chat**: The chat channel has a budget of attentional and time resources it consumes with each text message token. Players generate the tokens and transform them into knowledge or relationships. If the pool of attentional resources is consumed by too many messages flooding in, there’s no attention left to process the messages and the information is lost.

**Part 2: Challenges of applying economics to social systems**

The thought that first came to mind when investigating the topic of ‘prosocial economics’ is that we should see what real-world economics has said about related ideas. Sadly, traditional real-world economics does not map perfectly to game economics. There’s been some impressive work exploring the overlap, but both the methods and goals of the two disciplines can be quite different.

**In games, scarcity is a design choice**

Economics is predominantly concerned with the central Economic Problem, namely

- **Limited resources**: There are limited resources in the world;
- **Unlimited needs**: Greedy humans have essentially unlimited needs for those resources.

This leads to economists spending most of their time trying to answer a few big questions:

• What goods and services do you (as a society) produce?
• How do we produce them efficiently from our limited resources?
• How do you deliver them?
• Who gets them?

Right off the bat we can see there are some critical constraints that aren’t shared by game economics:

- **No scarcity**: We usually don’t have limited resources unless we have deliberately decided to limit them. We can create as many virtual goods as desired whenever we want. Player attention and cash are the few limited resources we care about.
- **Virtual goods**: Our goods and services operate in a cartoon world. We can imagine them to be whatever we desire -- even infinitely transforming -- as long as they fulfill their role in the internal
economy or satisfy the player’s psychological needs. The movement of goods is not an issue unless we want it to be one.

- **Digital ownership**: Anyone can own a given item if we allow them to. Just because Bob has the Magic Sword of Smiting doesn’t mean you can’t have one as well.

**Economics only recently has embraced psychology and computation**

Economics is an ever-evolving discipline, but it has theoretical foundations that reach back to at least the 1700s. The influence of older ideas and models continues to this day. For cross-disciplinary spelunkers, there’s simply a lot of economics history that needs to be parsed through in order to distinguish a modern, validated idea versus an ideological fossil.

**Poor integration with psychology**

Psychology wasn’t a thing, so early economic models of human behavior are problematic. Here’s just a few head scratchers.

- **Homo economicus**: The most common behavioral model assumes that humans are atomic individuals who operate rationally and selfishly. We know now that humans have limited attention, are contextually altruistic, are highly tribal, and exhibit a wide range of irrational cognitive biases.
- **Individuals are the best judge of their needs**: We know from more modern research that much of relationship formation and short-term valuation is obscured in order to foster long-term, mutually beneficial support relationships. Our brains are not conscious of the base psychological processes driving some of our most pressing needs and are thus unable to value relationships rationally.
- **Weak social modeling**: Most economics models ignore basic human behavior such as friendship networks, affiliation networks, limits on cognitive resources (ex: attention) or altruism. Highly nuanced and layered group behavior is bundled up into cartoon-like institutional entities (The State).

Interesting areas of investigation include behavioral economics, which is starting to grapple with a few of these issues using piecemeal experiments.

**Recent adoption of computational models and data collection**

Modern economics study (since the 90s) has increasingly used computers to test more complex models. However, these build incrementally on early work that was limited by the data collection and computing capabilities of the time. Where game developers essentially have a panopticon that records every possible player interaction within our cartoon worlds, economists are usually desperately making do with any data at all.

- **Reliance on proxies**: Often economics studies can track poor fidelity aggregate data (macroeconomic values) or smaller quantities of shallow data divorced from context (pricing or purchasing logs). They are forced to create proxies of scavenged proxies when attempting to describe the real world.
- **Weak sampling**: It is expensive to sample everything in the real world, so data is lost. Individual actions are often lost and there’s no way to get detailed or complete historical trails of underlying data.

In games, metrics and processing complex models is relatively cheap. We may gain more from studying game theory (especially iterated computational simulations) and some microeconomics. It is not currently obvious what macroeconomics offers beyond general rules of thumb.
The practice of economics erases many of the social phenomena we are interested in examining

Economics embraces reductive utilitarianism and posits you can put a price on anything. Once you make this critical assumption, there are all sorts of wonderful things you can do with prices, buying, selling, etc. However, simply putting public prices on relationship interactions breaks them.

- **Transactional relationships**: We tend to be intrinsically motivated to connect to others and invest long term in a relationship where no extrinsic value is ever publicly admitted. When a relationship transitions into being an extrinsically rewarded transactional relationship, the relationship often suffers a catastrophic loss of value.

- **Undervaluing long standing social networks**. Human groups create public goods in the form of unmeasured relationships, social norms and cultural practices. These public goods are incredibly valuable in terms of individual health and happiness. Yet they are not readily measured by economic transactions. Economics in general struggles with public goods, and social public goods are even more invisible.

- **Over-emphasis of short-term measurable improvements**: Efficient production using measured inputs and outputs is an easily optimizable value. But it may or may not be a long-term benefit. Unmeasured factors (aka externalities) often dominate social systems long-term. Politics, weather, technological change. And when these drive catastrophic failures, the response is usually “Whoops, well, we never promised we were perfect.” And tragically, the same tools with the same underlying flaws are redeployed for the next round.

A historical vs an experimental focus

The practice of economics is as much historical mapmaking as it is a science. Economists are mostly poking at existing, highly complex socio-economic systems and attempting to accurately measure results. Interventions intended to bring about future results are as much guesswork as they are predictions of proven models.

- **Reliance on natural experiments**: Many large-scale macroeconomic theories are essentially untestable in laboratory conditions. Instead, there’s a tendency to look for ‘natural experiments’ and fit the models to the data. Most important natural economic situations occur rarely (ex: major recessions) and are burdened by confounding variables. To a degree, models based on natural experiments become an exercise in data mining, with incentives for overfitting and with limited opportunity to invalidate resulting models. Some journals encourage pre-registering of study results in order to reduce p-hacking and other poor research practices, but this is not yet widespread or mandatory.

- **Underpowered experiments**: Many economics experiments involve small groups (often college students in a class). Meta-analysis show that upwards of 50% of empirical economic studies results are not reproducible. And upwards of 80% overstate their effect size by 2-4 times.

- **Scope of experiments**: Certain emergent elements of economies (such as firms or tribes) tend to show up only in large populations that run for extended periods of time. Social systems in particular are heavily mediated by group size and the relationship formation process that drives social effects coalesces over 1000s of hours of real human interaction. Experiments done in a 45-minute classes or 3-hour labs are often poor analogues for long-term social economies.

In the last couple decades, there’s been an increased reliance on randomized trials (what game developers would consider a version of AB testing) and increased focus on confronting economics’ replication crisis. However, bringing scientific rigor to economics still appears to be a work in progress.

All this makes it a challenge to pull clear models out of economic literature and apply them directly to our
game designs. At best, some microeconomic theories seem to be generally true within given contexts. But like many design tools, these are subtle instruments to be wielded to craft a desired outcome.

**Political influence**

The practice of economics has increasingly become intertwined with the politics of governmental policy. Politics is as much a world of using the right rhetoric and building the right alliances, as it is about doing quality science with reproducible lessons.

Your typical theoretical economist will wait years, if not decades, before witnessing any policy changes that actively test their theories. And often the economists who are most successful are those that invest in the political relationships and rhetoric that makes their work palatable. This dynamic drives insidious corruption.

- **Scientist rhetoric**: With the dramatic success of physics in unlocking the atom, economics was seen as a comparatively unreliable practice full of quacks, poor predictions and fake math. In response, modern economists cloaked themselves in complex, yet non-verifiable mathematical models and public claims of being truth speakers. "The math says X" acted as a powerful appeal to logic and credibility...whether or not the math was ever right.
- **Ideology**: If economics is a design practice, what is the desired outcome being designed? More political creatures long ago realized that economics is a tool that can push a society towards a given set of social values. Various conservative and liberal political agendas regularly put forth economic policies intended to drive quite disparate futures.
- **Faux-economists**: Much of the popular discussion of economics is delivered by political talking heads who have very little academic understanding of its limitations. They use scientist rhetoric and ideological propaganda techniques to push their agenda to the public. This problem is further exacerbated when political entities fund economic research.

The political influence alone makes it incredibly difficult for those outside of economics to distinguish if shared lessons are reliable insights or heavily biased propaganda. The latter has deep, deep roots that are often invisible and unquestioned to the more devoted practitioners of any given affinity group.

**The conundrum of prosocial economics**

So, we are left with two conflicting thoughts after all our investigation

- **Economic design is required**: We must carefully design, build and balance economic systems when creating multiplayer games. To paraphrase Douglas Martin, the alternative to good economic design is always bad economic design, not no design at all.
- **Economic tools are poor**: The more academic study of economics gives us fewer reliable insights than might be hoped for. There's a slight overlap between the crafting of economics of the real world and the crafting of economics of virtual worlds. But what insights might exist are heavily obscured by poor modeling of human behavior, weak experimental tools and a two-century deep cesspool of political propaganda.

We are not equipped to immediately solve this conundrum. There is clearly a vast project, far outside the scope of this paper, where those educated in the field of economics and game design dig through the dismal wastes of economic theory. Perhaps there are intellectual treasures to be found. For those future seekers, we've tried to document many of our unanswered questions in the Conclusion.

For the rest of this paper, we track back to our domain of expertise, game design. As game designers we can apply a prosocial aesthetic framework that helps us use economics ideas (if not the full economics
discipline) to drive designed experiential results.

**Part 3: Reframing economics as a tool for expressing a system of prosocial value**

What if, instead of trying to treat economics as a science, we use it as a set of tools that support a design practice?

**Game design aesthetics**

A critical goal of game design is to create an **aesthetic** experience for the player. There’s some set of values the team is aiming towards creating.

- **Explicit values**: Teams regularly write down their project pillar or an “X statement”. For example, a team might decide to build a go-kart racing game that parents can play with their young children, with the hope that this will form warm family memories that will last a lifetime. There’s an audience, a desired outcome, and a set of values that the team works towards.

- **Implicit values**: Games also are designed according to unstated values. For example, a 4X strategy developer might recreate the genocidal values of colonialism. When asked if this was their intent, they claim to have not thought about the issue at all; they were merely mimicking the practices of the established genre. However, unexamined ignorance of inherited values still results in a game with those values. Ignorance does not create ideologically neutral games.

**Building, with intentionality, towards an aesthetic destination**

With this design perspective, we have no need for rhetoric of manifest destiny or inevitability of scientist math. Instead, we are humbly upfront that designers will do the following:

- Be explicit about their values.
- Make design choices to the best of their ability...
- ...In order to create a player experience...
- ...That supports their selected set of moral values.

**Measurable results**

Now, the process is not entirely arbitrary. Since we are dealing with real humans containing real temporal, spatial, psychological and material constraints, this is an engineering exercise. We are craftspeople doing hard, practical labor. Game design can never be a purely theoretical fantasy or exercise in hopeful hermetic elegance.

With clear explicit values, it is possible to measure the result on our players and judge the success of our work. The machine that we build for our players either achieves our aesthetic goals or it does not. And we can then tweak and tune our system rules accordingly so that future iterations might hone more closely to our ideals.

**Economic aesthetics**

Now let’s come back around to economics. What if we treat economics as a design practice instead of a
science? One that is also seeking to create an aesthetic outcome? To express a set of designer-selected values?

In popular culture, this perspective on economics is uncommon. It is more likely to hear claims that there is One True Way of building an economy. Much of this is your basic rhetorical polarization, where if no one seems to be listening, you shout your opinion more loudly and with less nuance. Some of it may purely be a result of the relative youth of economics as a science. For now, however, let’s put the One True Way on the backburner.

Let us entertain the thought that there might be many valid economy designs, each of which deliver a particular set of aesthetic values. Our goal as economic designers is to craft the systems that drive our selected set of values.

Again, just as in game design, this craftsperson framing does not mean we are allowed to dream up any old fantasy. There are truths and common emergent dynamics in economic systems. Trade creates value! It also destroys it by missing key externalities. Supply and demand generally work! For certain types of goods and certain types of markets. There are selfish agents within any sort of exchange economy, as well as altruistic ones.

What sort of world do we wish to build and how does the economy we design serve those values?

**Prosocial values**

We invite you to adopt an explicit set of *prosocial values* when you build your games and their supporting economies. These values include both experiences we want to build towards and outcomes we want to avoid.

**Positive values**

Prosocial play involves players behaving in a manner that benefits the community as a whole. It is composed of many designed systems that facilitate the following:

- **Friendship**: The formation and maintenance of healthy, meaningful friendship networks between players.
- **Thriving individuals**: The facilitation of individuals’ eudaimonic happiness. Individuals feel competence, volition, and relatedness, both for themselves and for their friends.
- **Altruism**: The promotion of activities that involve intrinsically motivated altruism and cooperation.
- **Positive group norms**: The spread and enforcement of shared altruistic social norms within and across groups.
- **Shared goals**: The definition and adoption of shared group goals. Players work towards those goals via mutual interdependence, and achieve feelings of purpose and meaningfulness.

**Anti-values**

There are also values we wish to avoid generating with our social systems.

- **Individual toxicity**: Individual toxicity is when poorly socialized individuals resort to antisocial behaviors in order to meet their internal psychological needs. These are expressed as grieving, bullying, sociopathy, narcissistic abuse and other ego-centric patterns that put the individual above the group. These behaviors often provide short term benefits to the egotist and poor outcomes for everyone else in the community.
- **Group toxicity**: Group toxicity is when intergroup friction (resource competition, enforcement of social norms, competing group identities) results in unhealthy interactions. While competition
between groups can motivate group performance, it also can breed damaging behaviors such as organized aggression, hate crimes or racism. There’s a growing movement in games (centered around community management) dedicated to fighting toxicity of all types in games.

- **Loneliness**: Loneliness is what a person feels when they want to be with other people, but cannot. This may be due to a sparse relationship network, or logistical challenges that prevent them from connecting. Loneliness is one of the key emotions we feel when our social support network fails. Like pain telling us the stove is hot and we should pull our hand away, loneliness tells us that our current social situation is untenable long term and we should seek out connection with others.

**Benefits of prosocial design aesthetics**

There are of course many potential values a designer might select. So why would we pick these specific prosocial values?

- **Support from psychology**: There’s a growing body of research that suggests these values result in happy individuals and groups. This research (like all incomplete science) will no doubt grow and change over time, but it is the strongest experimentally verified foundation we’ve found for improving the lives of our players.
- **Ethics**: Responsible social systems design requires an ethical core. Much like medical doctors, we are operating on human beings. Huge populations of humans, in fact. As ethical practitioners, we need our own equivalent of the Hippocratic oath. We should do no harm, and if possible, improve the social health of our players. The prosocial values listed are an attempt at creating a code of conduct that is a minimum ethical bar.

**Part 4: Prosocial economic design patterns**

The following is an incomplete set of economic design patterns. Like all design patterns, they provide the canny designer with early tools for supporting prosocial values in their game using economic systems. Be careful; patterns do not guarantee results. They are instruments to be wielded with skill, precision and craft. If you want to get the result you desire, each of these patterns benefits from a lifetime of intentional practice.

This set of patterns is by no means complete. There’s immense work to be done exploring and extending these ideas through hands-on practice and iteration with live game populations. But it helps to begin somewhere.

**Pattern: Friendship formula**

To start with, we need a richer psychological foundation to build upon than economists’ rational optimizer. A useful model for social systems design is the distinct process by which human relationships form. This contains elements of contextual **reciprocity** that are found in across multiple field: Social psychology, newer flavors of both economic game theory, economic altruism models (see Appendix) and behavioral economics. We can use the friendship formula as a key tool to design prosocial values into a game.

**Key friendship factors**

Though every friendship has a unique history, they all require several key factors

- **Proximity**: People must be able to interact with one another.
- **Repeat encounters**: The same people need to identify and interact with one another repeatedly. For example, matchmaking systems that match different strangers together are weak social systems because there will never be enough repeat encounters to facilitate true friendship formation.
- **Reciprocity**: People exchange resources with one another in the form of attention, conversation, gifts and support. One party makes an overture and the other party responds. This is an opt-in process at every stage. Successful reciprocity loops tend to increase in value and effort over time.
- **Disclosure**: As the relationship grows, people will disclose intimate information to one another. This helps build trust and fine tune mutually negotiated social norms.

**The accumulation of trust**

As the reciprocation process continues, the participants gain trust in one another. The higher the trust, the greater the strength of the relationship. Ultimately highly trusted friends form key long-term support networks in times of need. It is a blind investment for most people; with each short-term interaction, they don’t fully know why they are investing. Yet long-term the strong support network predicts improve health and a longer, more satisfying life.

**Accelerator of friendship formation**

There are additional factors that help friendships grow more quickly.

- **Similarity**: If two people feel they are similar to one another, they are more likely to initiate the friendship process.
- **Intensity**: If two people are in an intensely emotional situation due to high risk, large amounts of resources in play or time pressure, they are more likely to become friends.
- **Autonomy support**: Self-determination theory suggest that people who support one another’s autonomy needs (the need to feel like you are choosing your path in life) are more likely to invest further in the friendship.

**Pattern: Measuring trust**

A key metric of relationship strength is trust between two individuals. As trust in a community increases, support networks flourish. However, trust is typically considered an externality, a factor poorly measured or valued by economic systems. So it gets optimized out in the name of efficiency. By measuring trust, we help ensure that it is treated as a first class citizen alongside more material concerns.

**What to measure**

Trust is an internal factor that cannot be measured directly so instead we need to rely on proxies. These won’t be 100% reliable (and represent a major area for further discovery and research), but are a starting point.

- **First, measure pairwise bonds**: We’ll start by looking at player dyads. This is the most fundamental network connection and more complex network topologies can be derived from this data. There are two different (asymmetric) bonds for any given pair of player; the bond player A to player B and the bond from player B to player A. For simplicity, many proxies collapse this into a single symmetric bond.
- **Active time spent together**: One of the easiest symmetric bond proxies is simply tracking if players are in the same area together. Due to players being idle, it is usually wise to track time only if they are actively playing. This metric does not track the intensity of the trust, but merely the duration. Higher values of time spent together means your dyad fulfills the initial requirements of the friendship formula (repeat, serendipitous encounters).
• **Success together in high trust situations**: If your game has cooperative or team activities, you can track if various dyads are successful and how often.

• **Time spent talking positively**: In games with text chat, we can go one step further and track number of times that a player talks to another player using positive language. Tracking simple words lists with positive affect are a good baseline and there is more sophisticated language analysis available if necessary. There are versions of this technique that can be applied to vocal analysis as well to determine positive or negative tone. The nice thing about this metric is that it tracks asymmetric relationship bonds, where one person talks a lot or uses relatively more positive language than another. Time spent talking, especially on private channels is a sign of increased intimacy and is almost always correlates with high trust.

**Analysis and tuning**

Once you have these metrics, the development team uses them to tune the system. This is for the most part standard data analysis; you create baselines and then track to see if any of your design changes are impacting the baselines positively. Note that these metrics are not usually player facing for the reasons listed below in Challenges.

• **Total trust over time for each dyad**: Trust should accumulate slowly over hundreds or thousands of hours. Total trust is a reasonable proxy for overall strength of the pair’s relationship.

• **Rate of trust accumulation**: Large gaps in the accumulation of trust suggest a pause in the relationship. Humans have a limited budget of active relationships so it is very natural for someone to stop reciprocating with another player as the relationship fades. Gaps let us track the length of the relationship. As well as if the relationship is rekindled at some later point.

• **Create trust metrics for higher order groups**: Total trust can be aggregated from dyads and tracked for an entire guild. Or a cohort that comes in from a particular onboarding source. You can often correlate these with other variables like guild churn.

**Example**

In *Steambirds Alliance*, a cooperative MMO, we measure trust by a ‘togetherness’ factor. When a player kills an enemy, all nearby players also get XP for the kill (a positive sum resource as in Pattern: Positive Sum Resources below.) This event is tracked and stored on each player as a list of other players nearby that also got XP. We do initial tracking on the client and then send periodic lists to our metrics server. We post-process this data to generate various graphs.

So how would we categorize the strengths and limitations of this metric?

• **Symmetric bond**: Due to how XP is given we don’t know if one player has higher trust than the other. So this metric is limited to assuming that both players like one another the same amount.

• **Mixed trust**: We’ve got a weak tracking of “success together in high trust situations.” There’s some nuance. Players who are getting XP from fighting smaller enemies need lower coordination, so trust doesn’t need to be as high. But players who are getting XP from higher coordination boss battles are likely in a higher trust relationship. In the future we could split those two metrics and test if the increase in fidelity helps us better track useful behavior.

• **Actively playing**: We assume that when players get XP, they are actively playing (since inactive players don’t get XP) and they are working with others to blow up their mutual NPC enemies.

• **No accounting for freeloaders**: We don’t account for free-loaders or bots because we haven’t observed them being a meaningful population of players.

A mistake we made early on was looking primarily at metrics like retention and monetization. These simply don’t tell us much about what motivates players to play. If I were to build the game again, I would have implemented the togetherness metric for the very first private alpha. Player relationships are top-level intrinsic motivators and by only measuring them late in the process, we completely misunderstood
the state of the game we were building.

**Challenge: Avoid sharing pairwise trust metrics**

Imagine if your friends all had a trust score hanging over their head. And when you do some small things, you witness the number change. Your relationships would suddenly become transactional in nature with clear extrinsic motivators in the form of your willingness to make that number go up or down. And we know transaction relationships and extrinsic motivators reduce trust. Are you interacting with your friends because you like them and they like you? Or are you trying to make a stupid number move?

So never share detailed trust metrics with your players. Trust, like many social variables, if revealed to the observed subject as an operationalized metric irrevocably changes the subject’s behavior. You’ll ruin the validity of your metrics and likely degrade the relationships between your players. (This is also one of the reasons why ‘likes’ in social media end up being a source of toxicity and in general a very poor practice.)

**Challenge: Sharing group health**

You can, if needed, share some high order group health information. The best practice here is to keep it vague, heavily delayed and multi-dimensional so that the underlying metrics cannot be easily gamed. A common use for group health information is to drive positive behavior by directing players towards a few key activities that developers know will improve overall social capital. Think of directives that are broad like the Ten Commandments so that players maintain agency and localized judgement. Avoid suggesting highly specific (and thus identifiable and gameable) activities.

**Challenge: Trust differs across social contexts**

Individual trust exists on top of a bedrock of group norms. For example, a pickup basketball team is a high coordination, moderate trust group. Players know that within the context of the basketball court they can trust one another to play according to the social norms (the rules) of pickup basketball. If you only sampled this social context, you might imagine that everyone playing is in a deep relationship with one another.

Yet, this relationship is contextual. Outside the basketball court, two players might never talk. When you create your proxies for trust and social capital, it is worth taking into account context. The more rigid and proscribed the rules of group coordination, the less actual trust is required for players to work together. And your metrics of trust may not travel to other portions of your game.

A way around this is to track multiple trust metrics in multiple contexts. High trust dyads in multiple context should be treated as having stronger relationships than those with high trust metrics in only a single context. Note that one of the more interesting to measure contexts is family bonds or mate bonds. These often have large impacts on behavior but are rarely perfectly visible from inside the game.

**Pattern: Positive sum resources**

Positive sum (also called non-zero sum) resources are a key economic tool for ensuring cooperative play.

**Zero sum resources**

Material resources in the real-world are zero sum resources. If I own a piece of pie, there is one less piece of pie for you to own. If I consume that piece of pie, it is lost to you forever. This probably makes you irritable due to loss aversion. An economy of zero sum resources is a world of scarcity. The challenge economics attempts to solve is how we might split up these limited resources in an efficient fashion.
Inevitably this involves some form of competition either via trade, negotiation or warfare. All of these tend to reward (at least in the short-term) selfish strategies and their resulting social toxicity.

**Positive sum resources**

However, in digital worlds, resources are mere bits. Making more of a resource is free. If we found a positive sum digital pie, you could have a slice and I could have a slice and the pie would be undiminished. My getting a piece does not prevent you from getting a piece. There is no need for competition between two parties over a scarce resource. This area of exploration is connected to the software theory of agalmics: non-scarce resources.

There are a few natural positive sum resources, and correspondingly game systems based on non-scarce resources are -- scarce. Time, for example, is something that everyone experiences equally and simultaneously (it is also not transferable). Information is usually positive sum. If I read a book, you can too.

With code, we can make almost any resource positive sum. When a monster drops loot for one player, it can also drop loot for any other player that did damage. Whether or not players compete over a resource becomes a design choice, not a fundamental constraint.

When doing prosocial designs, positive sum resources are one of the first tools you should reach for.

- Watch people play and look for moments of competition or toxicity.
- Are there zero-sum resources at the heart of those interactions?
- Can you turn those into positive sum resources in a way that players are no longer incentivized to be toxic?

**Challenge: Building games around positive sum resources**

If you are new to game design, you might imagine that games require zero-sum competition or at least a sense of winning to be enjoyable. Luckily there are many classes of gameplay that work with positive sum resources

- **Coordination and cooperation activities:** Players with differentiated and limited capabilities can work together to accomplish goals larger than themselves.
- **Races:** You can still have competitive challenges where players try to do their best within some limited amount of time or a fixed number of moves. Most cumulative scores are an inherently positive sum resource where anyone can earn points independent of other players.

In general, almost any Player vs Environment (PvE) game is amenable to being redesigned using positive sum resources.

**Challenge: Infinite sources and imbalanced economies**

If everyone gets resources, how can we prevent our sources from generating too many resources and flooding the world with abundance? We often rely on scarcity to creating prestige tokens or tune the pacing of gameplay.

- **Per player caps:** Capping the number of harvestable positive sum resources per player restricts the flow into the world. A tree might be harvestable for apples, but any single player can only harvest the tree once.
- **Per group caps:** We can also cap total number of harvestable items per group. This helps prevent intergroup competition by ensuring each group has equitable resources.
- **Transaction costs:** Even with caps, the total number of items increases for each additional
resource receiving entity (individual or group) in the world. With cheap trade transactions between entities, it is possible to pool vast numbers of resources. A thousand players means a thousand times the items. However, you can prevent global pooling with large transaction taxes. Transport might be expensive, or you could charge a hard currency as a trade fee. This ensures that players are encouraged to use the resources locally vs globally.

- **Appropriate sinks**: Any flow of resources, no matter how large can be balanced with large enough sinks. Measure the rate that positive sum resources are coming into the world. In real world economics this can be a tricky thing to figure out. In a virtual world it is a simple metrics check. Then tune sinks such that an equivalent is sucked out. For example, you might find that 20,000 new Magic Coconuts are flooding into the economy each day. A decay rate of 24 hours ensures that this (newly) highly perishable good never accumulates more than 20,000 units.

It is important to internalize that as a game economy designer, you control the sources, the sinks and the narrative justification for why the world works as it does. Scarcity as well as abundance are aesthetic choices.

**Challenge: A human’s total relationship budget is a zero-sum resource**

We might imagine that relationships are also positive sum resources. Me being friends with you shouldn’t have any impact on whether or not I can be friends with someone else. The reality is complicated.

In a highly local context, when you consider a few people at a time, forming a new relationship creates a positive sum public good. This is shared between the people in the relationship and essentially creates value in the form of social support and improved coordination. It is often beneficial to make overtures to weakly connected players you encounter on a regular basis.

However, if you zoom out and consider the entire social network of an individual, they have limited social resources to spare. The social psychology concept of Dunbar’s Layers suggests that humans have a relatively strict budget on both the total number of relationships and the number of high strength relationships their brain can manage.

For someone with a full set of friends, investing in relationships in one layer pulls resources from from
other layers.

Like many social resources, this is a difficult-to-acknowledge trade off. By explicitly acting upon that ideas that total social energy is zero-sum, especially in localized small group settings, the relationship become codified and transactional in nature. And thus suffers a drop in trust.

**Pattern: Knowledge Resources**

Nobel Prize winner Paul Romer has looked at a specific form of positive sum resource known as a knowledge resource. By taking a particular set of scarce zero-sum resources and performing learned transformations on them, we can derive vastly more utility than if we had just used them naively. For example, wood might be burned in an open fire pit to create the desired resource 'heat'. However, if someone knows how to build a brick stove, we can burn the wood hotter, store heat in the stone and ultimately gain more heat from less wood. From this perspective, knowledge is positive sum resources that help dramatically increase the efficiency of using scarce goods.

A wonderful prosocial attribute of knowledge goods is that supply is determined by the number of clever people you have creating them. Since knowledge is research by clever people, the more clever people we have playing, the more knowledge we'll likely gain.

This is the opposite of most zero-sum scenarios, where having more people around drives increased competition for scarce goods. With appropriate design of your knowledge good economy you can make it so instead more smart players are an advantage, not a threat.

**Some examples of knowledge goods**

- **Player skill**: When players learn actual skills such as learning to execute a tricky fighting combo or defeat a complicated boss, they've acquired a knowledge good. In terms of interaction loops, this involves combining base level interaction (like jump in Super Mario Brothers) into compound interactions (such a using a double jump to get past a tricky section). Player skills, like most knowledge goods are teachable and create an economy of attention and narrative around passing skills efficiently onto other learners. Streamers traffic, in part, by showcasing their knowledge goods (they also foster parasocial relationships and acts as reference relationships, but that’s a whole other set of topics)
- **Technological process**: Conceptually similar to player skills, technological processes involve combine existing resources and tools using the right order, amount and methods in order to create more useful resources and tools.
- **Explorable spaces**: If you have maps full of unknown areas or hidden secrets, the act of exploring the space yields knowledge. You can share this information with trusted allies.
- **Spies and espionage**: Games like Eve set up competitive games, where knowing where and when an attack or resource transfer occurs makes the difference between success or failure. This adds a layer of trust and betrayal where sharing knowledge goods with the wrong people may result in your downfall.

**Challenge: What about virtual knowledge?**

Video games have a long history of creating tokens that represent real knowledge. Instead of actually training to gain the skill of fighting with a sword, instead players are awarded with a virtual token (or virtual skill in Jesse Schell’s terminology) that says they can now fight with a sword. Or at least perform the themed in-game action that looks like sword fighting.

Virtual knowledge is a straightforward game resource that we can choose to make positive sum or not.
Since it is just a token, our systems can trivially pass it around or give it to various players. As unlocks, items or whatever.

To make virtual knowledge more social, you need to build in some form of transfer mechanism between players. Real knowledge goods have an implicit transfer mechanism in the form of conversation, but that doesn’t work for virtual knowledge. In MUD of yore, the only way to learn a game skill was to approach a skilled player and ask them to ‘trained’ you. Usually for a fee or time. There were fun variations where an advanced player can only advance further if they manage to teach a newer player one of these virtual skills. These creates a tit-for-tat reciprocation loop where both players are getting something they need.

In general, when setting up transfer mechanisms, such as the one here with virtual skills, try to create a natural interdependency between players. Economic mechanisms that encourage players to seek out and interact with other players helps facilitate the friendship equation.

**Pattern: Voting Resources**

A specific form of positive sum resource is a vote. Each voter has an explicit ownership of their vote and there are usually rules to prevent vote selling. If more voters appear, using the magic of positive sum resources, they also get a vote.

Votes are then transformed via a decision mechanism (aka voting) that determines whether or not some course of action is taken. Voting is a social system for managing politics.

The important thing to note here is that we typically don’t think of votes as economic resources. They are often talked about as part of the domain of political science and most literature covers a handful of relatively conservative systems (plurality, ranked voting, etc). But once we reframe them in economic terms, we gain a large number of tools for manipulating and building novel prosocial voting economies.

**Example**

In the multiplayer VR game Beartopia, players could build various communal projects for their shared virtual village. However, there was a limited amount of public space and it was undesirable let anyone simply build what they wanted without buy-in from other players.

So we designed an obfuscated voting system themed as crafting.

- If a player did a minimum amount of work, they could harvest berries from a bush. Berries were a crafting ingredient used in various communal projects.
- Secretly behind the scenes, the crafting ingredients were considered to be positive sum voting resources. They were instanced per player. They were untradeable. They had a cap on how many could be accumulated.
- When a communal building project came up, players needed to pool their crafting resources to complete it. The was the equivalent of needing to vote for the project.
- The cost for large projects was determined by the number of players in the world. It was tuned so that it would require a substantial amount of participation by players the world to create long-lived objects that consumed public space.
- We also had short-term public objects that almost any individual could create. They might take a day of individual harvesting labor but also expire in 8 hours. Since these were not a lasting consumption of the public good (communal space), we could set the crafting thresholds lower. Thus allowing more individual control on short time spans. We wanted a system where individuals were empowered to make local changes, but you needed the political power of increasingly larger groups to make more permanent communal changes.
By putting expiration dates on most public projects, we ensured that with a lack of ongoing public attention, public goods would revert back to the public domain. This helped create persistent long-term shared goals for players simply seeking to maintain the status quo.

**Pattern: Interdependency of player roles**

One of the early lessons of the industrial revolution was that division of labor allowed workers to vastly increase their productivity at multi-step tasks. Groups of specialized workers working together were more productive than an equally sized group of generalists.

This pattern for organizing human resources has three interesting attributes that make it pervasive throughout social systems design.

- **Increased efficiency**: Functional interdependence is relied on economic incentives; the specialized players are more effective or efficient a certain types of resource acquisition or transformation. In other words, there are natural incentives readily obvious to the individual player that they should specialize in order to maximize their personal playtime.

- **Coordination required**: Interdependency leverages some form of process or skill (a knowledge good!) to coordinate all the players together. To gain the benefits of specialization players need to interact with others. And teach one another.

- **Trust-based**: Finally, it is a social system fueled by trust. Each member of the group needs to have trust that other members of the group will perform their roles according to the plan. There are downsides for the individual members if the group falls apart. Specialization has a substantial opportunity cost; such players are unlikely to be effective generalists. In the real world, if the societal coordination systems that let specialists (most game designers, apart from Jason Rohrer) work together failed, we would all starve.

**Challenge: High performance, specialized group activities scares new players**

Because there are strong penalties associated with the failure of high coordination activities, it takes a huge amount of group trust to pull off the most efficient (and complex) activities. One of the biggest fears of new players is that they’ll be required to engage in specialized, high coordination group performances. If they fail, their reputation with this new group of people is tarnished forever. Leading with high risk, high coordination activities generally will send folks running from your game.

So designers need to build a ladder of activities in their game, starting with low trust activities between generalists and moving towards higher trust activities between specialists. The following illustration from the paper The Trust Spectrum shows the basic progression.
Challenge: Turning people into replaceable cogs

One response from systems designers is to build systems that allow coordination between specialized players at lower levels of trust. The thought goes, “Since trust is rare and hard to acquire, perhaps we could get efficiency out of our specialized groups in more mechanistic and scalable ways”

In the real-world, we’ve seen this in a practice known as deskillling, where highly trained skills are turned into a series of rote actions that are simple to perform and teach. These deskillled actions are coordinated, not by trust, but by an algorithmic (often computerized) system. A very early version of this was the assembly line. These systems scale to larger groups and can make use of broader labor pools. If you only care about the output of the system, they can be quite attractive.

However, if you care about the experience of the players, there are a couple questionable things happening here.

- Deskillling removes the opportunity cost of specialization. There is no investment in a given role. Role switching cheap.
- There’s less trust required to coordinate. The simplicity of the actions plus the role of the computerized coordinator means that groups practicing together see less overall efficiency gain.
- Each worker becomes a low-trust cog that is easily replaced if they do not do their specialized role.

Deskillling systems are typical low trust systems that are helpful to new players. However, they are unable to facilitate the formation of high trust relationships.

Pattern: Shared Vulnerability

We know from psychology studies that shared pain acts as “social glue”: experiences of shared struggle create tight bonds of trust that yield greater social cohesion and measurably improved cooperation.

This can be harnessed in games through structuring experiences whereby players experience shared struggle early in the formation of a group. In many online games, players have discovered this organically and include it in their guild rituals.
Example: Guild Onboarding in Eve Online

When high-retention fleets were studied in *Eve Online*, a pattern emerged in the fleet manuals (often exceeding 80 pages) created by these high-functioning organizations.

One particularly high functioning fleet created a formula that was to be followed exactly:

1. Recruiter finds new recruits in a neutral zone
2. Recruiter gives everyone the same ship
3. Recruiter gives each new recruit a role that they understand. The intention is to make sure the recruit feels useful to the larger whole.
4. Specific behavioral instructions are given, for example: “A. Find this target, shoot it.” Then “B. Shoot targets of type N that approach.”
5. Some organizations specify redundancy in roles, so that there is no identifiable single point of failure in the mission.
6. Then the newly formed group is taken into combat with the specific intention that they will all die together.
7. After this happens, the recruiter explains that it was okay, and that it was a bonding exercise.
8. The recruiter also replaces all lost materials. The intention is to demonstrate support in a time of need.

This playbook of an experience creates high retention in groups through this mechanism of a shared memory and an establishment of interdependence, loyalty, and generosity.

Challenge: Formalizing Trauma

The risk of relying too heavily on this is that it creates downstream undercurrents that influence a game’s overall culture by grounding the bonding event in shared trauma. If these traumas are significant enough, they can convey lasting damage onto the social relationships of the group members. We can assume that most in-game traumas are far less significant than real world traumas, but these experiences fall into an unstudied place and it can become hard to determine how much pain is too much.

It seems possible to assume that the infliction of fear and experience of loss will have some repercussions on the group’s future dynamics. Further, the coping mechanisms that develop under crisis may not transfer to more peaceful contexts. Therefore, the shared trauma of an early experience may have to be continued thematically through the game (a game about war continues being about war) which then sets a dynamic across the experience that is hard to disrupt. The challenge then is to carefully calibrate the kind of shared vulnerability -- which is likely a very wide design space -- and manage a thoughtful transition to more peaceful forms of gameplay that amount to recovery therapy.

Challenge: Solidifying Out-Group Hostility

Because these mechanisms for bonding are explicitly successful within guild contexts, which are tribal contexts, it is not clear whether the benefits persist or are possible without a kind of enemy tribe. For combat-based games, this is highly effective, but it isn’t as clear how it would translate to a non-zero-sum shared massive environment. Out-group/inter-tribal hostility is a powerful design mechanism in and of itself that is of questionable prosociality -- being in a kind of “adrenaline” category of design mechanism that results in very high levels of comfort within established groups and higher isolation and discomfort outside of or between groups.
Pattern: Player-to-player Trade

Trade increases overall value by allowing exchange between players who own differentiated goods. By giving up something a player doesn’t need for something that players does need, both players in a transaction come out ahead. There’s a lot to say on this topic; many mistake this topic for the totality of economics. For a very brief overview, see the appendix on Trade.

From a prosocial perspective, the question we are interested in is “How does trade improve human relationships?”

- On a macro level, by creating abundance through trade, we theoretically can escape a world where poverty-level survival dominates our daily lives. Excess resources could then be invested in our relationships. The not dying from famine, war, disease, ignorance and other outcomes of extreme scarcity is nice as well.
- On a micro level, trade results in the reciprocal negotiation between at least two traders. As a result of this negotiation, people inevitably disclose their values with one another. And perhaps start to form a relationship. This style of trade is most common with ‘less efficient’, person-to-person barter systems. Though claims of efficiency depend on large part on what is being measured.

Challenge: Auctions dehumanize buyers and sellers

One of the great inventions of modern capitalism is the ability to boil down all of a person’s values into a single price on a commoditized good. A buyer can decide if they are willing to pay the price and the seller (by listing the price) automatically agrees to the subsequent sale.

Auction houses turn both the buyer and seller into low-trust, mechanistic entities. They can engage with a regularly updated listing of goods, quantities and prices and ignore the human on the other side. Humanity, in the form of face-to-face reciprocal interactions between people with names, histories, desires and culture, has been meticulously eliminated from the process. Too inefficient.

This results in immense improvements in material market efficiency. Selfish players clamor for such features in any game that includes trade. But it is worth asking if it drives the prosocial results that we desire.

Before you add a global auction house, consider the following ideas:

- Games don’t require material efficiency. We have enough control over our economies that we can generate abundance on demand if required. Consider, players regularly ask for infinite power or inventory and we don’t give them those things. Because we know scarcity is a design element that drives our experiential outcomes. Similarly, there’s no law of nature stating we must climb an inevitable ladder towards ever greater efficiency in order to satisfy infinitely selfish actors.
- Build barter or gifting-based trade system for friends: Barter systems are disliked because they put pressure on our limited trust and relationship budget. Negotiating prices with complete strangers can be time intensive and exhausting. And it takes away from time and effort spent with our core friends. However, bartering or gifting with friends can be a very enjoyable social activity. What if you can easily and cheaply trade with players who are within your stable friend circle? A more free-form version of the same idea is to allow theft and betrayal so that trade tends to happen within high-trust circles.
- Trade can be a specialized role that facilitates weak ties: Not everyone needs to trade with everyone to create large-scale, yet socially viable networks. Creating specialists trading roles that serve 150 to 500 people generates trade hubs that also serve as social hubs. These facilitate weak ties between denser, smaller friendship networks. Manage the density of trade hubs by culling those
that dilute the 150 to 500 person sweet spot.

**Pattern: Tying social metrics to business success**

One of the great challenges of social design is that many business owners feel that it is an expensive extra. Should game designers play political games and show how social design drives business outcomes?

**Find correlations with key business drivers**

- Split your population into higher trust and lower trust segments
- Look for correlations between trust and key business drivers like retention and monetization.
- In general, you'll likely find a very strong relationship. Intrinsic motivations, like social relatedness, are typically about 3X as strong a motivator than many of the extrinsic motivators found in more single player activities.
- Use these correlations to justify additional investment in prosocial game design.

**Challenges**

There are immense pitfalls that come from following this pattern. Profit motivated capitalism tends to be incredibly damaging to social systems design. See Dark Patterns below for examples.

**Part 4: Dark patterns of economic design that sabotage prosocial play**

Prosocial economics explicitly brings the tools of economics into social system design. And it promises to be an effective and scalable means of promoting societal values. This combination is a honeypot for bad actors. There is a future where the basic social technologies we’ve described in this paper will be used to create systems of immense evil, debasing the very aspects of friendship that we seek to elevate.

We’ve already seen some of these negative outcomes.

- Facebook coopting social networks in order to sell unfiltered political advertising to the highest bidder.
- China creating systems of social credit to survey and control those citizens who step out of a narrow range of acceptable behavior.

It is easy to imagine ideologically motivated governments, political parties and religious groups who co-opt the functionality of games to inject toxic tribal behaviors into the broader world.

Yet treating social systems design as a trade secret is also problematic. Again, the “alternative to good design is bad design.” To do good design, we need to grow a broad population of educated practitioners who are informed about both the craft and its negative outcomes. So that when things start going off the rails, we can identity and censure those who engage in dark social design patterns.

It is in the light of describing and enforcing ethical standards that we cover some of the darker patterns of prosocial economics.
Dark Pattern: Optimizing the system to improve proxy metrics instead of overall prosocial values

When a complex social phenomenon (such as trust) is measured with proxy metrics, it obfuscates much of its expensive-to-measure nuance. This is exacerbated by the tendency to select proxy metrics because they are easy to measure, not because they are high quality proxies.

Subsequently, it is common for optimizers and balancers to start to mistake the proxy metric for the original phenomena. And as they make the proxy go up, they end up inadvertently damaging the hidden nuance of the original phenomena. Sadly, that nuance often turns out to be the real value we were trying to preserve and grow.

There are many examples of this:

- **GDP**: In the real-world, you see governments optimize top-line GDP (gross domestic product). Over time, this proxy for economic growth and citizen well-being has become less correlated with these larger, more complex values. We see lower income segments suffering as small wealthy minorities accumulate the majority of newly generated wealth.

- **Togetherness in Steambirds**: In our earlier example involving Steambirds Alliance, the togetherness variable was an easy-to-implement proxy for trust. As implemented, it depends on us checking if players are ‘near’ to another player when an enemy is killed. If we wanted to boost our togetherness values, we could simply increase the radius we check for ‘near’ players. With a large enough radius, the togetherness metric would hit 100%. However, despite the number going up, we’ve lost all insight into player ‘trust’.

- **Viral installs on Facebook**: During the era of social network games, analytics teams optimized for increasing the virality of their games. ‘Virality’ was really a proxy for the complex social phenomena where a friend tells a friend about something they like and this trusted recommendation results in a highly engaged new player. In order to improve ‘virality’, social networks games began spamming friend lists with automated invites to games, often with minimal permission from the original player. These invites failed to trigger almost any of the important trust and reciprocation loops in the original phenomena. Instead, the spam damaged existing relationships and brought in low retention, unengaged new players. Pretty much all the games that seeded their audience with this distinctly low trust technique eventually failed.

**Possible fixes**

- **Cross functional teams**: Bringing multiple perspectives into the decision-making process ensure that a single perspective does not dominate.

- **Holistic metrics reviews**: Always return to the original prosocial pillars of the project and ask if your microdecisions and optimizations are still in-line with the holistic goals. What was the original intent of the proxies as they pertain to your prosocial pillars? Are you still measuring what you think you are measuring? It can be worth setting up a regular official review, but equally valuable is training the people making decisions in the field so they catch mistakes as they happen.

- **Player interviews**: One method of capturing nuance is to talk to players directly. If you are only watching dashboards, you only witness what you are measuring. In depth qualitative interviews with key players uncover new trends and behaviors. What do they care about? What motivates them? What new skills or organizational techniques are they now using? You can then follow up with quantitative metrics gathering to understand the scope and impact of those behaviors.
Motivational crowding is when a task that someone is intrinsically motivated to perform is instead encouraged with an extrinsic reward. As soon as the extrinsic reward ceases to be given, the person no longer wishes to do the task. Even if they were excited to originally do it for no explicit reward. The intrinsic motivation is said to be ‘crowded out’ by the extrinsic motivator.

Extrinsic motivators are much easier to put into systems. The game can dole out standardized rewards of commodity goods or currency and they can be triggered in a rote fashion upon the mechanistic completion of a well-defined task. For example, if we want to tell a person that their comment on a social media site was viewed and appreciated, we could add a ‘Like’ button and then report the total number of likes accumulated. We’ve turned a complex relationship into a tidy number you can watch ticking upward. Ding!

Intrinsic motivators are generally complicated and tied to an individual’s internal needs. Though intrinsic motivators are more effective, longer lasting and result in higher overall happiness of the person doing the task, they are far more difficult to design, measure and systematize.

The result is that designers tend to rely quite heavily on extrinsic motivators. And in the process, inevitably damage our intrinsic motivations. This is highly problematic in social spaces, since social interactions tend to be intrinsically motivated and involve nuances unique to each individual relationship. Whoops.

Personalize rewards

In this era of modern computation, there is no reason why we can’t be far more targeted and contextual with our incentives. By tracking where each person is on their personal journey through their game progression, through their acquisition of friends, through their micro actions we can create personal models for what they might desire.

Stop designing for populations of average players and start designing for the intrinsic motivations of the individual player. Even small shifts in this direction, such as facilitating activities based off the state of a player’s direct friend network, can have large positive impacts on engagement.

Scope of metrics and their impact as extrinsic motivators

Social metrics such as a ‘Like count’ can quickly turn into extrinsic motivators if you aren’t careful. Carefully scope how your metrics are revealed to minimize negative impacts.

- **Internal**: In general, most social metrics should be Internal, metrics that are only shared with the internal development team. This eliminates the dangerous feedback loop in which a person attempts to influence their own metrics.
- **Private**: Slightly riskier is a Private metric where you share a person’s information with just that person. This creates a feedback loop but it is limited to only that individual and they have full control over what they do with the information. This is especially important for sensitive information around reputation or facts that could be damaging to share without a foundation of trust.
- **Group**: One layer out from the individual are trusted friend circles or affiliation networks. We start to see social metrics generating politics, censure and other group dynamics. These are intense feedback systems that can result in unexpected results. This is known colloquially as drama. At this scope, we also start to see new intrinsic motivators based off status start to arise. Status-driven motivators can start to offset some of the motivational crowding. Of course, this only works for high status individuals in the group. Low status people who don’t see their public metrics move respond as if they’ve been shunned. This negative outcome is exacerbated by social anxiety.
- **Public**: The most dangerous metrics are public ones that are shared broadly. We get all the drama
of group interactions, but we also get in-group and out-group competition. Various tribal groups use sensitive information to engage in hate mobs, griefing and other forms of abuse. Popular status seekers, especially those with narcissistic tendencies, thrive in these spaces. Use public social metrics with immense care.

**Questions to keep in mind**

There’s no clear fix for this issue. Instead, I try to keep myself honest by asking several questions periodically.

- **Are you applying an extrinsic motivator to something that players would do of their own volition?** Many times, we apply rewards to activities out of habit. Pause for a moment. Does this social interaction really need a flashing reward screen with a loot drop of crafting materials or currency?
- **Can you build the context within which intrinsic motivation can take over?** Instead of mechanically telling players to do activity A for reward B, you can instead provide a space to do Activity A and highly visible affordances. Give players a small amount of room to stumble upon the activity. And pursue it if they want. Animal Crossing is a lovely example of this sort of constrained small space and intrinsically motivated activities.

**Dark Pattern: Replacement of prosocial values with selfish values**

The most likely source of corruption of a prosocial economic system is when it managed by an unreformed capitalist. An executive who believes in the selfish nature of humanity will tend to replace the core prosocial values with processes that are shortsighted and profit motivated.

**Economists (and capitalists who love economics) tend toward evil**

Those that practice economics -- and to a degree modern American capitalism -- are heavily invested in an implicit system of self-centered moral values. A well-documented phenomena is that economists behave more selfishly than other professions. They are less fair, less loyal, less cooperative, more prone to deception, and give less to charity. This appears to also impact executives who use economic framing of problems.

In part, this seems to be due to the field of economics attracting selfishly motivated people. But it also appears to be the result of indoctrination. The repetitive doctrine that humans are best modeled as selfish rational optimizers creates a set of selfish social norms that practitioners consciously or subconsciously follow. The act of studying economics makes you a morally worse human-being (by most definitions of morality.)

There is another possible cause for this selfish behavior, which is economists’ high exposure to commercial systems. The presence of currency itself, and the tracking of it and focusing upon it, seems to lead to rationalizations that justify selfish behavior. We see this in particular in games as a dimension of the above dark pattern, reliance on extrinsic motivators. Pure exposure to extrinsic motivation systems, of which accumulation of currency is one, seems to bend human behavior toward norms that justify maximization of that accumulation. It is possible that the persistent high exposure to game currency -- and as we have stated, almost all games have currencies and tangible economies of some kind -- has the same effect that exposure to economics has on economists.

**Values as identity**

These values are embedded at the level of personal and tribal identity, and so in groups they become
naturally amplified. When challenged, the result is a blunt dismissal of any information that disagrees with the existing world view and a re-entrainment in existing beliefs. One merely needs to read the responses to some of the studies on selfishness in economics to realize this is not an open-minded, self-reflective group. (My favorite is that claim that economics is perfect, it is merely all other fields of study that mistakenly train up altruistic, prosocial citizens)

A clash of values

When worldviews clash, those with the more power wins. A powerful executive, indoctrinated in the ways of selfish capitalism, is very likely to dismiss the prosocial value at the heart of social system design. A very difficult argument to win. Prosocial design presupposes an altruistic model of human behavior that has long been scrubbed from the selfish predator’s worldview.

We’ve seen this first-hand with companies like Zynga, where capitalist managers methodically and deliberately optimized delightful games about creativity and sharing (Farmville) into viral advertising engines that actively degraded relationships. Even in the face of their market crashing, at no point did they stop and question their selfish worldview. Instead they doubled down on burning out more players to maximize revenue extraction.

Potential alternatives

- **Be explicit about key prosocial values.** State prosocial design goals as key product pillars that are inviolable. Have someone who understands prosocial systems own and enforce these across the entire company.
- **Tie economic value to the maintenance of prosocial value.** Get the profit-minded forces at the studio on board with a win-win partnership. Use facts like intrinsic motivations being 3X as powerful as extrinsic motivations. Or the crowd-out effect of extrinsic motivations damages long term LTV. These can turn the selfish desires of executives into support for prosocial design. Align prosocial design with smart business design.
- **Don’t put business in control of prosocial systems:** Create an organizational firewall between those handling the prosocial systems and those directly driving profits. Acknowledge that your short-term focused business teams may not have the values, goals and mindset to properly grow and manage business critical social systems.
- **Hire prosocial executives that know the value of these systems:** Instead of fighting a losing battle with entrenched executives who have a long history of fetishizing selfish economic behavior, seed new teams with strong leadership who already buy into the mission of building prosocial games.
- **Ethics standards for social systems designers:** A longer term dream is to create ethical standards for social systems designers. Perhaps in the future we could build training programs for this deep skill set. And bind trained students to a set of ethical standards. There would need to be some form of censure as well if lines were crossed.

Conclusion

In conclusion, we have described:

1. All games with resources have economies.
2. Economies that do not consider their end aesthetic outcome devolve into antisocial patterns. Specifically, toxicity and loneliness.
3. Real world economics often undervalues or ignores prosocial behavior. It is challenging to apply directly to games.
4. There are a handful of prosocial economic patterns we can use as designers.
5. Economies, being motivational systems, are inherently subject to exploitation and dark patterns.

**Summary of Patterns**

Prosocial mechanical and economic patterns identified in this paper include:

**Measuring the Unmeasured**
- Measuring trust (quantifying social capital)
- Positive sum resources
- Knowledge resources

**Facilitating Connection**
- Friendship formula
- Player-player trade
- Shared vulnerability

**Facilitating Expression**
- Voting resources
- Integrating social metrics with business success
- Differentiated resources

**Further work**

This paper is intended as an initial exploration in the domain of prosocial economic game system design. Much further work is needed to explore, codify, and test these patterns and ones that may be discovered after.

Patterns that we identified but have not built out in this paper include: 1) group leveling, 2) friendship resource (differentiated resources), 3) incentivizing generosity, 4) nurture play, and 5) expressive orthogonality through fashion.

Further areas of interest uncovered by our preliminary exploration include:

- **Prosocial economic patterns**: Further expanding within the macro-patterns of prosocial design patterns.
- **Positive sum design**: Expanding the design patterns for non-scarce (positive sum) resource mechanics (game design without scarcity).
- **Public goods design**: Expanding design patterns around managing public goods, especially via decision mechanisms
- **Therapy**: Leveraging disordered personality behavioral archetypes and corresponding treatments for CBT-based (as one example protocol) game progression systems.
- **Managing social progression systems**: Scaffolding social skill development, and differentiating social skill development from meaningful relationship cultivation.
- **Transfer to non-game environments**: Transferring skills and social capital experienced in game environments outside the game environment (crossing the membrane).
- **Dark patterns**: Further exploring, and codifying, dark design patterns in extrinsic motivational systems, and their consequences;
Education: An open protocol of transparency and education regarding game-based motivational systems and economy design.

Ethics: Ethical rules for social systems designers as well as institutions who help promote those rules.

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Appendix I: Towards an action-based framework for mitigating loneliness

Defining Loneliness

A widely used instrument for detecting loneliness is the Roberts UCLA Loneliness Scale. First developed in 1978, it is estimated to have been used in 80% of scientific research studying loneliness, and has been found valid by multiple meta-analyses — so it makes a good starting point.

The original 20-factor Loneliness Scale has been condensed into smaller sets including the RULS-8, RULS-6, and RULS-3. We are primarily referencing the 1996 20 point scale, and distill from that scale some concepts sometimes referred to as “dimensions” of loneliness. These dimensions have been studied in medical research, but for our purposes we are proposing a conceptual framework of loneliness dimensions most relevant to game behavior:

1. **Exposure**: Relating to social vulnerability, exposure is feeling unsafe because one is alone. This often relates to the involuntary nature of the exposure, as contrasted with, for instance, solitude, which is a positive feeling of isolation rooted in its deliberate and voluntary nature. Exposure is a broad category of loneliness relating to index measures “I lack companionship”, “I do not feel part of a group of friends”.

2. **Ostracization**: An experience of social punishment, ostracization is the feeling of being “left out”, and especially being “shut out”, of one’s valued social group.

3. **Shyness**: A withdrawn state resulting from feelings of social isolation. The feeling that it is very risky to disclose oneself to others; a feeling that others will not understand you. Relates to “I am unhappy being so withdrawn”.

4. **Unfit/Outsiderness**: A feeling that one is around others but does not belong there. Belonging is a broad concept (discussed below), but “unfitness” relates to being in the presence of others with whom one does not feel connected. Relates to measures “People are around me but not with me”. Importantly emphasizes the presence of others who are not of one’s belonging group, with the absence of one’s belonging group.

Loneliness is a significantly studied phenomenon in medical and psychological literature. It is a kind of social pain that is known to have physical, emotional, and mental consequences under prolonged exposure. Loneliness has been medically associated with all-cause mortality, depression, and more.

Loneliness causes stress in humans broadly, relating to feelings of vulnerability, and can also provoke scarcity mindset, in which a host of negative outcomes occur. Scarcity mindset is a stress-induced “tunnel visioned” state that causes short term thinking associated with long term net negative outcomes.

**Kinds of loneliness**

As a creative empathy exercise, it can be helpful to identify distinctive, separate feelings of loneliness for which there aren’t English words:

- I have friends but I can’t count on any of them
- I have close family but they don’t understand me
- There are things I can’t share with my friends
- There are things I can’t share with my family
• There are things I can’t share with my spouse
• I have good friends but our group doesn’t have purpose
• I feel lonely and socially exhausted around my friends

These limited examples illustrate some of the complexities of loneliness, which represents a rich artistic space rife with subtlety and inner conflict.

Structurally, it can be helpful to think of two large categories of loneliness:

1. Emotional loneliness: Lack of an attachment figure
2. Social loneliness: Lack of social connection; social vulnerability; social isolation

It is important to note that not all loneliness is purely social or purely emotional; these are two separate dynamics that combine to produce the emergent sensation of loneliness. Emotional loneliness in particular is especially tractable in digital/fictional experiences; reading a book or taking care of a fictional animal can assuage emotional loneliness, even though these are solitary activities.

Amongst the more complex category of social loneliness, we can identify sub-categories as well:

• Affinity (sharing interests)
• Recognition (feeling known deeply by others)
• Belonging (feeling accepted): These can be split into Acceptance (feeling wanted and not judged) and Usefulness (filling a distinct need/role in one’s group)
• Companionship (feeling the presence of other social creatures)

When we are talking about prosocial game design, we are, in part, talking about game design systems that address the social pain of loneliness. By dividing loneliness up into its distinct constituent categories, we can more accurately aim experiences at assuaging specific target areas.

**What game designers need to know about loneliness**

From a game design standpoint, there are some important high-level takeaways:

1. There are multiple types of loneliness; it is not a single phenomenon;
2. Loneliness and isolation are distinct psychological problems;
3. Loneliness can be clustered within orthogonal sub-categories that must be independently addressed;
4. Loneliness is best thought of as a specific kind of social pain.

Prosocial design has a lot of interesting tools for tackling social loneliness. We have fewer tools for tackling emotional loneliness though this is a fascinating area of further investigation.

**Appendix II: The economics design lens**

Economics is one of many potential lenses, or perspectives for understanding a game system. As a designer, it is critical you can swap out lenses for examining a problem as needed.

For example, you can take a system like player chat and look at it via different lenses and learn something new from each.

• **Seen through an economics lens**: Use the tools of economics to assign values to relationships and track the time payments back and forth between chat agents.
• **Seen through a psychological lens**: However, we could just as easily look at chat from a psychological perspective and gain a set of insights that are impossible to capture with a purely economics lens. The emotional tone of a snarky response for example can be challenging to model with our simplistic set of tokens and transforms.

So what is the *economics lens* good for? It helps to think of the lens of economics in game design as having a couple basic superpowers. These end up also being its core weaknesses.

**Economic super power: Analysis and balancing**

Almost any game with a heavy systems focus benefits from using economics to balance or tune the systems to achieve a specific aesthetic outcome. There are several key steps in this process that build upon one another.

1. **Definition**: The economics of a system become visible the moment you start defining the exact tokens, source, sinks, etc. What you find out depends entirely on the quality of your definitions. And poor definitions result in weak insight.

2. **Economic analysis**: Once you’ve defined the components of the economic system, we can start interrogating why something is happening. The type of analysis you can do is limited to answering questions about resource flows and transformations. There are huge swaths of the gameplay experience that are hidden or only observable through secondary effects. For example, economic analysis can say little about a beautiful experience, but it can track the price and availability of that experience.

3. **Balancing**: Finally, an economic lens allows us to ask what-if scenarios, adjust our various defined economic components and then analyze and observe the results. You are always balancing in order to some overall aesthetic goal (in the Mechanics Dynamics Aesthetics sense of the term).

**Small errors accumulate**

Now, the clever reader will notice that the balancing step is built upon an unreliable stack. If your definitions are incomplete, your analysis will be flawed. If your analysis is flawed, the initial balance ideas will be impossible to verify. This is particularly challenging when your changes alter the very nature of the virtual world you are measuring. There less in common here with natural science than might be hoped. The iterative act of balancing an economic system in a virtual space can quickly turns into feedback loops where small errors accumulate.

Add in poorly modeled humans as key decision drivers and you can very easily design something that is a bit of a mess. Economies in games are often prone to inexplicable and unexpected exponential failures. We call these disasters by different names (ex: Mudflation, grindy, OP) but they are often failures of economic balancing.

**The predominance of toy-like economies**

So we punt and build toy-like economies that are trivially understandable (as is the case with most single player games). Or we build systems that are stable short term and a spiraling disaster only if left unmanaged (most multiplayer games). For multiplayer systems, we continuously micromanage them into some rough stability using god-like powers to shift the virtual world’s physics if things get too far off.

The bigger lesson here is that in practice, economic tools are essential yet unreliable design tools. Especially at scale. So we build systems that compensate and can be balanced despite the flaws in our tools.
Economic super power: Efficiently generating value through trade

Perhaps the single most meaningful insight that economics has added to the world is that trade generates material value for society at scale. The orthodoxy of economics may have poisoned a richer discussion of the topic, but kudos for the acknowledgement the historical practice and clarifying why trade is important.

Trade in games is mostly studied in the context of multiplayer games with player-to-player exchange of virtual items. For a primer, you should read Virtual Economies: Analysis and Design by Lehdonvirta and Castronova. Though designers have learned many lessons over hundreds of MMOs, it still remains a niche field of practice. In this modern era, many hyper focused, metrics-driven teams try to stamp out trade entirely due to the unmanageable chaos it creates. Once you introduce capitalism into your toy economy you’ve opened Pandora’s box of design challenges, both economic and culture.

The basics of trade

The basics go back to Adam Smith.

- Person 1 has access to resource A. But they know they really need resource B.
- Person 2 has access to resource B. But they know they really need resource A.
- So they trade with one another! Now they both have what they actually want.
- The magical bit: This was a positive sum exchange. Player 1 is happier and so is Player 2. Value has been generated from trade.

A drive for more efficient trade

This sort of basic barter certainly works, but the logistics are complicated to arrange. So we introduce an intermediate currency and use that to value both resource A and B. Now each person can just set a price for goods they are willing to buy or sell. As long as there’s a cheap way of sharing prices, any person can sell their low value goods to someone who values them more. And then take that excess money to buy the stuff they really want.

Trade scales

So why is this so interesting?

- Prices are set locally. The local agents determine what they value, so in theory you can just put a bunch of independent agents that know their own needs together in a common trade area and you’ll start to see market dynamics. The setting and sharing of an agent’s prices are a decoupling mechanism that allows the system to create somewhat scale free networks.
- With relatively little managerial oversight, a vast number of people can trade with one another efficiently. You do need some institutional protection or bad actors can start to sap profits through theft and extortion.
- Each iterative trade in turn generates enormous value across many of those participating in the market.
- That excess value is now possible to redirect into things like culture, leisure, research and moving beyond mere survival.

This process, when the right conditions exist, can be explosive. Huge amounts of material and human resources gain explicit value and are efficiently send zipping around in complex, somewhat self-organizing system that radically transforms everyone and everything involved. Capitalism, writ large, has according to
some metrics, resulted in some of the greatest increases in human health and stability history has ever
known.

**The inevitability of trade**

Trade has a degree of inexorable social physics to its emergence. Most large-scale societies develop it in
one form or another; though rarely to the degree of modern capitalism. We see this capitalist explosion in
multiplayer games all the time. The basic requirements for barter seem to be:

- Players can exchange goods,
- Those goods are differentiated and randomly distributed
- Players can negotiate relative value with one another.

Once barter is in place and the society is stable enough to create community standards, players develop
an emergent currency (usually some easily tradable item with a stable supply) This is then used to
facilitate efficient trade networks. In mere weeks or months there are merchant classes, black markets,
trade, commodities, trust networks and more.

Another perspective (a lens!) on economics is that it is a memetic virus that transforms a society and
distorts it to fit the functional needs of the virus as well as fostering the cultural values that help the virus
spread and thrive.

**Game developer superpower: Economic design tools available to
game developers**

Many of the practical issues that weigh upon real-world economics impact game developers less. Game
developers benefit from the following factors:

- **Large human populations**: A successful online game has many thousands of players. We can run
  experiments with real people without as much reliance on bad models or small samples.
- **Sources of new players**: We have access to new players who are more of a clean slate for testing
  out new ideas.
- **Rich data collection**: Our analytics can capture any economic or social interaction inside the game.
  Including rich historical streams of individuals or populations.
- **Control over most laws of nature**: We have full control over sources, sinks, transforms and any
  associated incentives. We can change the world to fit the model almost as easily as changing the
  model to fit the world. Players, math and time are still out of our immediate control.
- **Less politics**: Online games are benign dictatorships with voluntary membership. Though there are
  some checks and balances on performing radical economic experiments, there immense leeway to
  make changes.

**Appendix III: What does economics say about altruism?**

Most economics theory is based off the idea of a rational, self-serving actor. Economics is not wholly
ignorant of altruism. It merely is treated as a series of side theories that are not broadly integrated into
mainstream economic models or policies. It is worth mining these theories to see if any of them are
applicable to the design of prosocial economies.
What is altruism?

In economics, altruism can be defined as investment in public goods. These are shared resources or investments that benefit multiple people, not an individual owner.

Note that altruism and prosocial behavior in trusted relationships are not exactly the same thing. Altruism does not require trust, merely a shared public good. Though shared relationships at the heart of prosocial systems are almost always a public good within the local context of the relationship.

Onto the theories. We’ll start out with the earliest and most wrong theories and then progress to ones that slowly incorporate more experimental support.

Theory: Self-interest

If people are rational actors, when it comes to public goods, selfish people should act as free riders. Assuming most people are selfish, this would result in public goods being under provided for because most people free ride on the irrational contributions of a few. Examples of this include

- Environmental protection
- Public park
- Education
- Public health

However, people free ride less than expected. They are not purely homo economicus, the selfish man. Cases where they over invest according to self-interest theories include

- Paying taxes
- Voting
- Contributing to open source software

Theory: Incentivized prosocial behavior

Not willing to let go of the belief that people are inherently selfish, a variation of the self-interest theory is that people contribute to a public good are in fact getting paid. It is just in the form of non-obvious currency such as prestige. In practice, this doesn’t hold up since people donate charities anonymously.

Theory: Pure and impure altruism

We now get into outcome-based prosocial preferences. What if people inherently enjoy seeing the well-being of others, so they contribute to public goods? Imagine we gain internal utility (a ‘warm glow’) by helping others, so helping is intrinsically rewarding.

This also doesn’t match observed results. First, even when others are doing well and don’t benefit, people still donate. Second, such an intrinsic motivator would be a stable source of motivation. No matter what we should keep donating if there is continued need. But prosocial behavior decays with repetition. And people have this distinct tendency to punish the behavior of others. Which is a bit inconsistent with a purely altruistic motivation.
Theory: Inequality Aversion

What if we just hate inequality? Imagine that one’s relative standing in the leaderboard of income distributions drives people to reward those less well off and punish those more well off.

This one doesn't explain a lot of nuances about when and how people punish and reward others. Especially across different cultural contexts.

Theory: Reciprocity and Conditional Cooperation

Okay, what if who we are interacting with matters? Now the theories start to include some basic social psychology like reciprocity in their human models. And some interesting findings start popping up.

- Norm enforcement is intrinsically motivated: Expensive punishment of free riders is behavior that people perform even in the face of repetition. Almost all extrinsically motivated behaviors drop off with repetition. This is a key finding since it suggests that enforcement of social norms is an intrinsically motivated behavior.
- Altruism depends on perceived laziness: If someone sees a recipient as lazy, they tend to reduce donations to them.
- Reciprocity drives behavior: If you give a gift, the other party will often give one back. However, intentions also matter. Why someone does something impacts how the other party reciprocates. This is a big effect that also continues with repetition.

These observations also lead to the prediction that if more people act prosocially, an individual will be more likely to act prosocially. For example, one’s donation depends on the donation of one’s reference group. A 10% increase in donations by the reference group results in a 2-3% increase by the individual. So people are conditionally altruistic based off the social norms of the group.

Theory: Self-identity theories

A person ends up identifying with a reference group. And they’ll be more prosocial if two factors are true

1. The reference group thinks the action is good
2. The action is a valuable signal of the person's good traits as determined by the social norms of the group.

Theory: Frame effects matters

Now we start moving away from universal models of human behavior and begin to dig into the question of how context (aka the institutional environment) impact what someone decides to do. I think of this as economists discovering the importance of level design. There are a large number of studies on 'frame effects'.

- Do you have knowledge of free riding by others?
- Do free rider know they are being observed and by whom?
- Can you punish free riders?
- How strongly can you punish free riders?
- How were resources earned?
- Is the recipient a charity?
• Is the recipient a close friend or relative? A general group or a specific person?
• Is this your ingroup or an outgroup?
• Are the bad circumstances you are alleviating due to bad luck or poor choices?
• Did you form an agreement with the other party? Even if the agreement has no binding value, people rarely break them.

Additionally, the type of communication you have with the other benefactors of the public good matter. At this point we are starting to get really close to friendship formation and intensity as an accelerant for trust accumulation.

• Do you get to talk to the other person?
• Was it face-to-face? If so that results in a strong impact on altruistic behavior.
• Was it via a computer? If so there’s a much weaker impact on altruistic behavior.

Framing is another name for much of what we do as game designers as we set up contexts for players activities. There’s a wonderful exploration of reframing economic activity using game worlds in the book *Stealing Worlds* by Karl Schroeder.

**Theory: Monetary incentives in the world of frame effects**

Finally, we roll all the way back around to extrinsic motivators. But this time we are looking at ways that the system designer can create frame effects that alter an individual’s behavior.

• If the system makes an action cheaper or easier or slightly incentivized, the intervention can increase prosocial behavior.
• However, if you increase benefit too much extrinsic motivation 'crowds out' intrinsic and behavior drops.
• If monetary giving goes up, so does giving of time (complementary goods)
• Reliance on extrinsic motivators selects for selfish people.

**Theory: Heterogeneous populations**

At some point in all of this, someone raised their hand and says, “But what if different people engage in different strategies?” Individuals are heterogeneous; some tend to use one pattern of behavior while others use other patterns. A community is an ecosystem of agents, who depending on local conditions, take on different social roles.

• In some tests: 23-30% of the population always acts selfishly. No matter what. But 50% operate conditionally and are likely to behave altruistically if the right conditions exist.
• Presence of a reciprocal person causes other conditional people to reciprocate. Thus shifting the whole dynamic.
• Maybe teaching ethics helps create less selfish individuals. Economics hasn't studied this yet. (Students going into economics are more likely to be egotists already)