

# Free Will in a Deterministic System

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## Overview

What if I told you that the biggest philosophical debate in human history—whether we have free will or if everything is predetermined—has been asking the wrong question entirely? For thousands of years, brilliant minds have been arguing about whether you are the captain of your ship or just a passenger on a ride that was planned before you were born. I think I found a plot twist: using data from 1,200 animal social networks across 92 species (because animals do not overthink things like we do; guilty as charged), I have discovered that free will and determinism are not enemies locked in an eternal battle—they are dance partners moving to the same cosmic rhythm. On one hand, we have free will to make choices, and we do so with intention most of the time. On the other hand, we have biological tendencies, characteristics, skills, and varying resources that align with a deterministic system that encourages, rewards, and provides pathways in life that help us reach our best selves. Think of life as a massive escalator that is always moving forward based on structures way bigger than yourself, but here is the kicker: just because you are on the escalator doesn't mean you are paralyzed. You can still walk around, help someone who has fallen, start a conversation, or choose to be a jerk to everyone (though the deterministic system tends to punish that behavior). This paper reveals how these two phenomena work together in beautiful harmony, operating on different timescales and creating the perfect balance between structure and freedom that makes life both meaningful and unpredictable. It supports the conclusion that you are neither trapped in a predetermined script, nor floating alone in chaos—we are all participating in something far more elegant than either extreme could offer. Let me show you what it all looks like.

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## Background & Findings

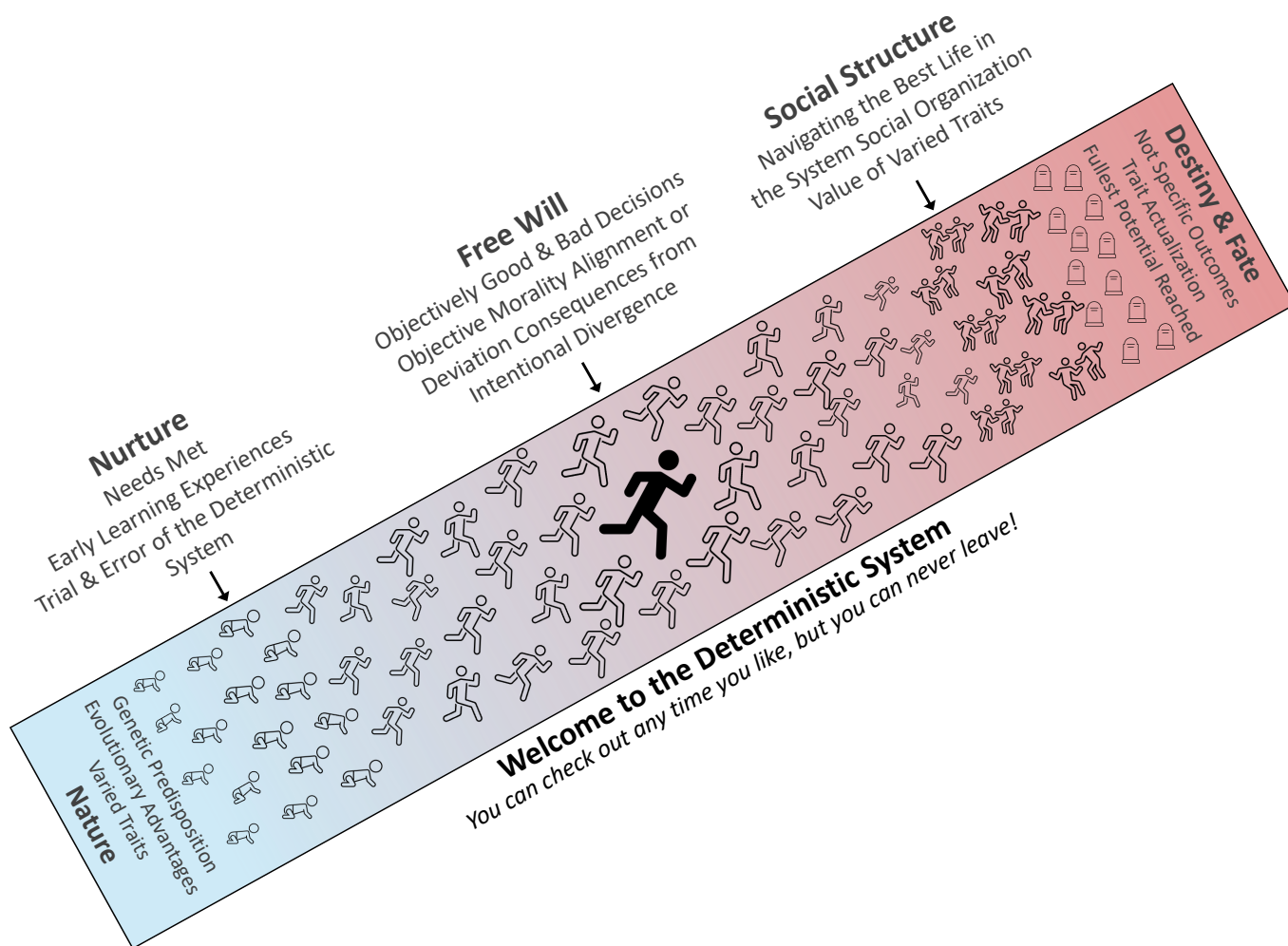
Have you ever made a decision that felt completely your own, only to look back later and think, "Wow, that worked out exactly how it was supposed to?" Maybe you chose a random coffee shop and met your future spouse there, or you took a detour that led to your dream job. It feels like you are making free choices, but the outcomes seem almost... destined. Right? This tension has puzzled humans forever. Are we really the authors of our own story, or are we just reading from a script that is already there?

Philosophers have been wrestling with this question for centuries, and they have split into two camps. Team Free Will says you are the captain of your ship—every choice you make is genuinely yours, and you could have chosen differently. Team Determinism says the ship was always heading to the same port—your choices might feel real, but they are just part of a larger pattern that was set in motion long before you were born. For hundreds of years, brilliant minds have presented compelling arguments for both sides. Free will advocates point to our sense of choice and moral responsibility. Determinists point to the laws of physics, the unconscious, and all the factors beyond our control that shape who we are. Round and round the debate goes, with no winner in sight. But here's the thing: what if this entire debate is based on a false premise?

What if asking "free will OR determinism?" is like asking "do you breathe OR do you have a heartbeat?" The question assumes you have to pick one, when the honest answer might be "both." I think we have been trapped

in what philosophers call a **false dichotomy**—**forcing ourselves to choose between two options when a third possibility has been hiding in plain sight**. That possibility? Free will and determinism are not opposites fighting for control. **They are partners in the same recursive dance**.

I didn't just come up with this idea—I have data to support it. Using real-world evidence from ~1,200 animal social networks across dozens of species found throughout the animal kingdom, **I have found that free will and determinism operate as completely separate, independent structures. They are both 100% real, both 100% active, and both 100% compatible**. Let me show you how the puzzle pieces fit together.



**Caption:** This figure visualizes the nature of free will in a deterministic system, demonstrating that the long-standing philosophical debate is an artifact of human false dichotomies rather than an actual contradiction. Free will is fully valid due to the existence of consciousness, which enables recursive introspection and decision-making. However, determinism is equally valid because no agent exists as a “tabula rasa”; all agents have inherited traits, environmental influences, and systemic constraints that optimize for collective scalability. Divergence is always an option, but the system itself provides strong incentives for alignment with structured complexity escalation. Destiny is not a predetermined endpoint but the full actualization of one of the many pathways the system values. Agents with more favorable starting conditions cannot simply opt out of growth, as hedonic adaptation ensures that the drive to actualize resets with each iteration. Now that this recursive-propagative reality is apparent, the illusion of a fundamental divide between free will and determinism dissolves.

## Welcome to the Hotel California of Existence

Picture this: you are born into what I like to call “**The Deterministic System**”—and just like the Eagles sang, “You can check out any time you like, but you can never leave.” However, here is the plot twist that has been hiding in plain sight for centuries: **you are not actually trapped**. Think of life as a massive, cosmic escalator. The

escalator itself? That is the deterministic system. It is always moving, always carrying you forward based on structures way bigger than yourself—your genes, your upbringing, the society you were born into, even the laws of physics. **You did not choose to get on this escalator**, but you cannot step off it. In that sense, the philosophers arguing for determinism are absolutely right.

But here is what they missed: **just because you are on an escalator does not mean you are paralyzed**. You can still walk around on it. You can run up faster, slow down, turn around, dance, help someone who has fallen (and you should), or choose to be a jerk to everyone around you (though you should not). You can make friends, fall in love, start arguments, or solve problems. **Every single one of these choices is genuinely yours to make**. That is your free will in action, and it is completely genuine.

The beautiful part? **These two structures are not fighting each other**—they are working together in beautiful harmony. The escalator (determinism) **provides the structure and direction**, while your movement on it (free will) **determines your specific experience and impact**. You are simultaneously being carried by structures beyond your control AND making meaningful choices that matter.

The old philosophical debate assumed you had to pick a side: either you are in complete control, or you are completely controlled. Still, that argument is like saying whether a river is "just water flowing downhill" or "just a bunch of individual water molecules making choices," **and it is both**. The system has momentum and direction, but within our system, **there is endless room for individual agency, creativity, and genuine choice**. **So yes, some things in your life might feel destined**—but that does not make your choices any less real or important. You are not a passenger on this ride; you are an active participant in the cosmic dance of agents to the tune of the Golden Ratio, **where structure and freedom move together in perfect harmony**.

### **Destiny Is Not a Destination—It's Your Potential Coming to Life**

Here is where most people get destiny completely wrong. **We have been conditioned to think of fate as some cosmic screenplay where every scene is already written, every line predetermined, and we are just actors hitting our marks**. But that is not what destiny is—that is just fatalism dressed up in mystical clothing. Real destiny, the one you feel when things work out for you, is more like having incredible genes for basketball. **You might be born with the height, coordination, and natural athleticism that could make you the next LeBron James**. However, here is the thing: those traits do not automatically make you a basketball superstar. **You still must choose to pick up the basketball and practice**. You still must push through the failures, develop your skills, and actualize that potential. Your "destiny," to be great at basketball, is not a predetermined outcome—it's a possibility waiting for you to bring it to life; **there are endless possibilities for your life, throughout your life**.

We have labeled some cultures as "**individualistic**," which are people who focus more on **exercising their free will**. We label other cultures as "**collectivistic**," which refers to people who focus on **building and reinforcing their deterministic system**. This separation is what the data reveal about how the system works. **You do not come into this world as a blank slate** (no hard feelings to the "tabula rasa" philosophers). You arrive with a **unique package of traits, tendencies, desires, preferences, and potentials**—some genetic, some shaped by early experiences, some influenced by your culture, your time period, and your starting resources (e.g., generational wealth). Consider these factors to be your starting toolkit.

**The critical aspect to consider is that having the toolkit does not mean the house builds itself**. You still need to decide what to build, how to build it, and when to build it. Someone born with natural empathy might become a therapist, a teacher, a humanitarian leader, or even a master manipulator—the trait is there, but how it gets actualized depends entirely on the choices they make along the way. **The beautiful irony is that the people with the most "favorable starting conditions"—the ones who seem destined for easy success—cannot just coast**. The deterministic system also prioritizes the traits and abilities that further its growth, which is why paths to

**high-paying jobs tend to involve helping the system cope, grow, and thrive.** These jobs include doctors, therapists, entrepreneurs, pop stars, and leaders of companies that provide essential services.

The deterministic system also has a built-in feature called **hedonic adaptation**, which continually resets the bar. Hedonic adaptation is a beautiful feature of our brains, **where no matter how much we win or lose in life, our expectations and feelings about our life trajectory persistently adjust with the changing circumstances.** Win the lottery, and within a year, you are back to your baseline happiness level, needing new challenges to feel fulfilled. Achieve your dream job, and suddenly you are setting even bigger goals. Lose a loved one, and eventually, you return to a new normal that is not as bad as when the loss happened. It is why people in less advantaged countries can be much happier than in resource-rich countries; it works in both directions. **It is like the universe refuses to let anyone rest on their laurels.**

**Destiny, then, becomes not about reaching some predetermined finish line**—it is about the full expression of who you have the potential to become and becoming that person. You are constantly growing and evolving; **the circumstances of your destiny are continuously expanding and changing, but you are always heading towards the best version of yourself.** You are not walking toward a fixed point; you are growing into an ever-larger version of yourself. **Isn't that beautiful? It means it is never too late to reach your destiny.**

**Table 1**  
*Redefinitions of Dataset Variables for Ease of Interpretations*

Variable Name	Original Label	Definition
Network Density	Network.Density	Proportion of all possible connections that exist in the network (0–1).
Local Triangle	Clustering	Clustering coefficient—proportion of closed triads around individuals.
Global Triangle	Transitivity	Global clustering coefficient—ratio of closed triplets across the whole network.
Average Connection	Avg.Degree	Average number of direct connections per individual.
Division	Q	Modularity score—how well the network is divided into subgroups.
Connection Spread	CV.Edge.Strength	Coefficient of variation in edge weights.
Bridge Role	Avg.Betw.Centrality.Weighted	Average betweenness centrality weighted by edge strength.
Pathway Importance	Std.Betw.Centrality	Standard deviation of betweenness scores.
Similarity Preference	Deg.Assort	Degree assortativity—whether individuals connect with others of similar degree.
Total Connections	Edges	Total number of edges (interactions) observed.
Connection Strength	Avg.Edge.Strength	Average strength (weight) per connection.
Cohesion	Cohesion	Tendency for individuals to interact more within their own group than outside of it.

*Note.*  $n = 1,195$  animal social networks spanning 92 species from the Animal Social Network Repository, a large-scale, cross-species archive of empirical animal behavior networks.

The deterministic system does not concern itself with specific outcomes. It prioritizes growth, complexity, and the full realization of your potential. Your job is not to find your predetermined path—it is to take the unique combination of traits you started with at your birth and see how far you can push them, how creatively you can

combine them, and how much positive impact you can make with them. That's not fate controlling you—**that is you controlling your fate.**

## The Data That Cracked the Code: Animal Social Network Repository

Okay, that is enough of me going on and on. I know what you might be thinking: "This all sounds great philosophically, but how do you demonstrate something like this?" It is a very fair question. **You cannot put free will and determinism in a lab and run experiments on them... or can you?** Here is where it gets interesting. Instead of debating these concepts in the abstract, I decided to examine them in their practical application: **in social behavior.** To avoid all the messy complications of human psychology, politics, and culture, I went straight to the source—**animals across species.**

I obtained a massive dataset called the **Animal Social Network Repository**, which is essentially a treasure trove of information about how animals interact with each other in the wild. I analyzed data from **1,195 animal social networks spanning 92 different species, from fish schools to elephant herds to spider colonies.** In the table above, you can see the variables that these brilliant biologists created and that I used in this paper. Each variable measures a different aspect of how animals interact with each other across all 92 species. **It is the perfect dataset to find free will in a deterministic system.**

Think about it like this: **when a dolphin chooses which other dolphins to hang out with,** or when a bird decides to follow the flock versus strike out on its own, **we are watching free will and determinism play out in real time.** These animals are not overthinking their choices or getting caught up in philosophical debates—they are just living their lives, making decisions within the constraints of their biology and environment. Yet, how do you measure something as abstract as "free will" in a dolphin pod? **The key is understanding that social behavior leaves fingerprints.** Every interaction, every relationship, every choice about who to connect with whom creates patterns that we can measure and analyze. **Let's examine some of these variables:**

- ◇ **Network Density:** How connected everyone is to everyone else. Is this a tight-knit group where everybody knows everybody, or more of a loose association?
- ◇ **Local Triangle:** When your friend is friends with your other friend, creating a stable three-way relationship.
- ◇ **Bridge Roles:** Which individuals serve as connectors between different groups?
- ◇ **Connection Strength:** Are these deep, meaningful relationships or just casual acquaintances?
- ◇ **Similarity Preference:** Do individuals tend to connect with others who are like them, or do opposites attract?
- ◇ **Cohesion:** How much individuals stick with their own group versus mingling with outsiders.

Each of these variables tells us something different about **the free will choices being made within the constraints of the deterministic system.** Some patterns reflect the **deterministic structure at work—the biological drives, environmental pressures, and social structures that shape behavior.** Others reveal the **individual free will structure—the unique choices each animal makes about how to navigate their social world.** The beauty of using this animal dataset is that it strips away all our human baggage about what free will and determinism "should" look like, and together in the real world. When I crunched the numbers on all 1,195 of these social networks, **something remarkable emerged...**

I conducted a principal components analysis, which examines data for hidden structures using an oblimin rotation (which allows structural components to correlate, if they do), extracting two components. I color-coded the findings to show that as loading **approaches 1 the shading becomes green**, and as the loading **approaches -1, it becomes red**, with loadings at **0 being uncolored.** We are looking for strong negative or positive loadings with each variable contributing to just one component, **which is exactly what we found.** Bolded loadings indicate that the variable successfully loaded onto the component with no cross-loadings (when a variable loads onto both components, which is usually not meaningful). Shockingly, the correlation between the two components was not significant,  $r(1,195) = -.022, p = .447$ , **confirming my hypothesis about free will AND determinism.**

**Table 2***Principal Components Analysis Findings Parsing Free Will & Determinism*

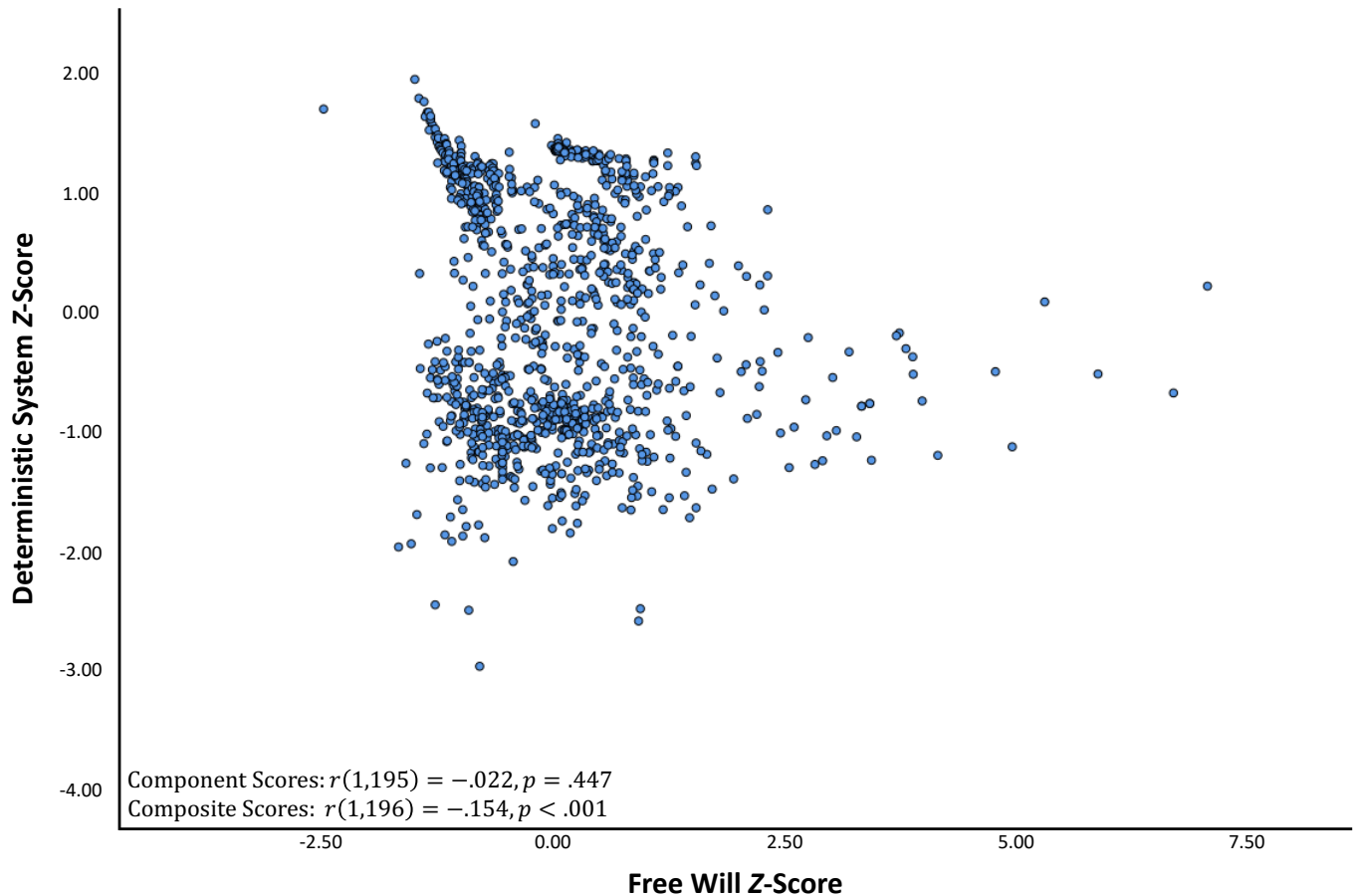
Variable	Deterministic System	Free Will
Network Density	<b>.938</b>	.212
Local Triangle	<b>.881</b>	.022
Global Triangle	<b>.794</b>	-.192
Average Connection	<b>.657</b>	-.308
Division	<b>.611</b>	.093
Connection Spread	<b>.580</b>	.043
Bridge Role	.001	<b>.907</b>
Pathway Importance	-.279	<b>.777</b>
Similarity Preference	.218	<b>.572</b>
Total Connections	-.074	<b>.539</b>
Connection Strength	-.088	<b>.538</b>
Cohesion	.191	<b>.476</b>

*Note.*  $n = 1,195$  animal social networks spanning 92 species from the Animal Social Network Repository, a large-scale, cross-species archive of empirical animal behavior networks.

Thus, the data confirmed that free will and the deterministic system are genuine and not mutually related. Further, the internal consistency (a measure of how cohesive the components are given the variables that comprise it) of the deterministic system is  $\alpha = .839$ , and for free will, it is  $\alpha = .714$  (values of  $\alpha = 1.00$  have perfect internal consistency). I transformed both composite scores to z-scores, which allows us to compare them to each other directly by standardizing the units of measure. **The findings confirm the existence of a free will component and a deterministic system component that are independent and well-documented.**

- ◇ **The Deterministic System** is precisely what you would expect from a structure beyond individual control. This pattern captures aspects such as overall **Network Density** (how connected everyone is), **Local Triangle** formation (stable friendship clusters), and **Global Triangle** patterns (how these clusters connect across the entire group). These forces are structural—the social architecture that emerges from biology, environment, and system-level pressures. When deterministic structures are strong, you see highly organized, predictable social structures with clear patterns and hierarchies.
- ◇ **The Free Will System** emerged as a distinct pattern, capturing individual agency through behaviors such as **Bridge Role** (choosing to connect different groups), **Pathway Importance** (the extent to which individual animals create unique social pathways), and **Similarity Preference** (personal choices about associations with other animals). When free will structures are strong, you see more individual variation, creative social connections, and animals making choices that reflect personal preferences rather than just following the crowd.

Think about what this finding means: **An animal can be living in a highly deterministic social structure (strong biological drives, clear environmental pressures, established group hierarchies) while simultaneously exercising tremendous individual choice within that structure.** The significant composite score correlation,  $r(1,195 = -.154, p < .001$ , shows that animals chose to give up a tiny portion of free will as a trade-off to benefit from the deterministic system. The system provides the framework, but individual agency determines how you navigate within it. **For the first time in history, we have empirical evidence that the great philosophical debate has been based on a false premise.** We have been arguing about whether it is raining OR sunny, when the real world is full of beautiful rainbows that require both sun and rain to exist.



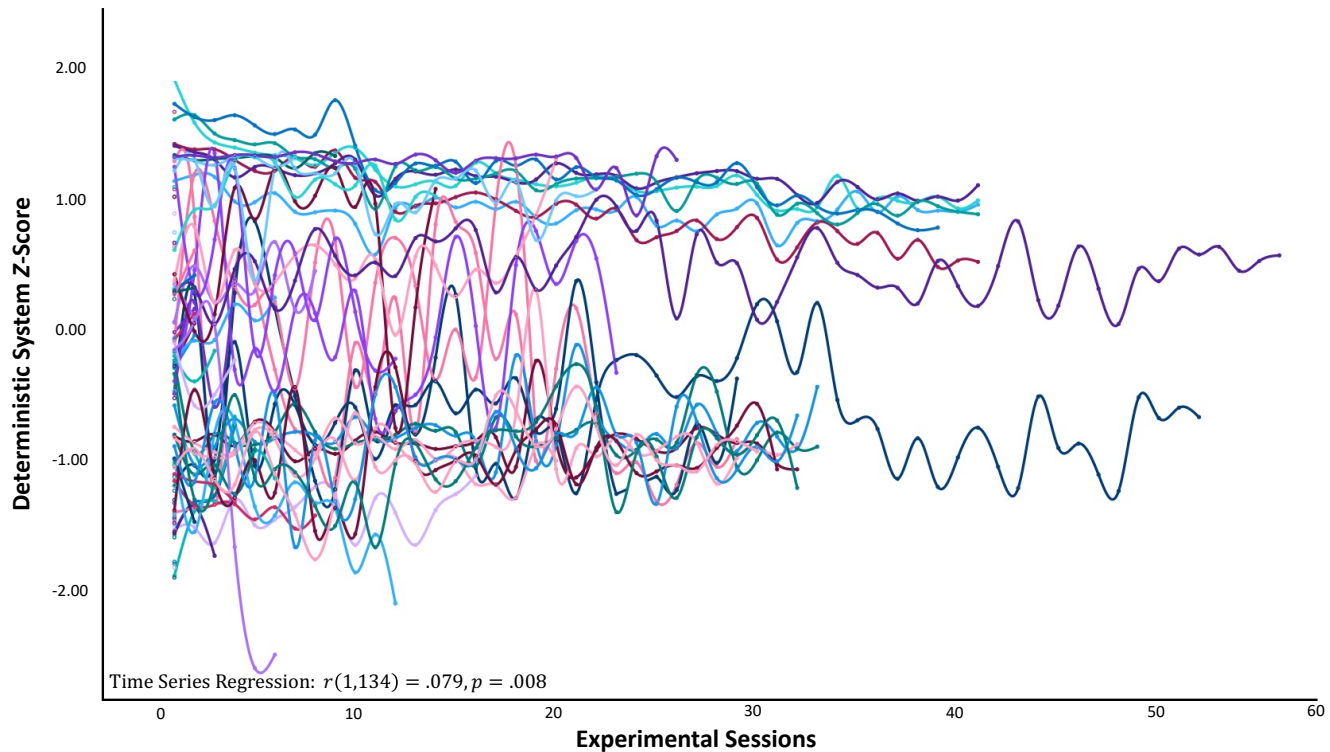
### Plot Twist: They Are Even Moving on Different Timescales

The story becomes even more interesting when we examine how these **two structures behavior over time**. Remember, these data come from real animal communities that researchers have been studying for years, allowing us to observe how free will and determinism interact as these social networks evolve. Look at the first figure—**this figure is the deterministic system in action over time colored by animal species**. Notice how it starts and stays relatively consistent? That makes perfect sense. When animals come together, biology takes the wheel—territorial instincts kick in, dominance hierarchies emerge, and basic survival needs drive most social organization. **These animal networks work to find the most effective and efficient scaling system organization and then optimize it over time to maintain consistency as they expand their environmental influence.** This process appears to be nearly entirely non-conscious; it is like nature's autopilot is running the show.

Further, here is what is fascinating: as time goes on, those deterministic structures gradually increase. The statistical trend shows an apparent increase over time ( $r = .079, p = .008$ ). It is as if the system sets up the initial framework—establishes the basic rules and structures—**and then slowly refines its grip as their social structures improve**. However, when you look at individual species, **some animals lean towards the deterministic system; whereas, others lean away from it as they both try to find the most effective balance**. The second figure tells a completely different story. Free will starts low and stays relatively flat for a long time, then gradually increases as communities mature. The correlation is much weaker ( $r = .054, p = .068$ ), which tells us something important: free will does not follow a predictable timeline like deterministic structures do, suggesting that the deterministic system is an emergent structure from the individual choices of the agents controlling it. In other words, **free will is given and stable, and the deterministic system is emergent and changeable**.

Think about what this means in the real world. When a new group of dolphins comes together, or when birds form a flock for migration, **the initial social structure is heavily driven by instinct and environmental pressures**.

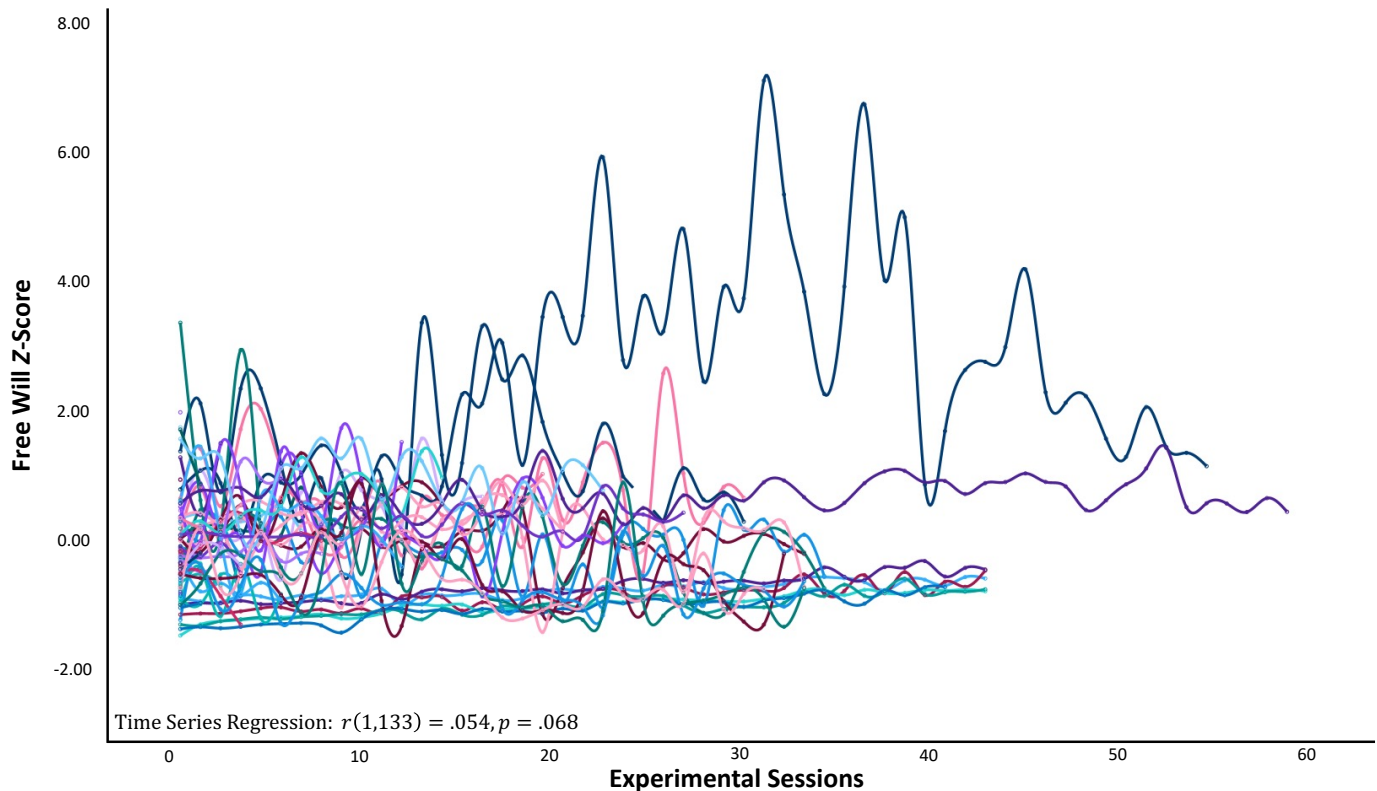




But as these animals get to know each other, as they establish relationships and figure out their social dynamics, individual personalities and preferences start to matter more.

### The Beautiful Dance of Structure & Choice

What we are seeing is like watching a dance where the music gradually shifts. Determinism provides the strong, driving beat at the beginning, setting the tempo, establishing the basic rhythm that gets everyone moving. However, as the song progresses, individual dancers begin to add their flourishes, making personal choices about





how to interpret the music and **creating variations and innovations within the established structure that supports their scaling trajectory and refines that of the deterministic system.**

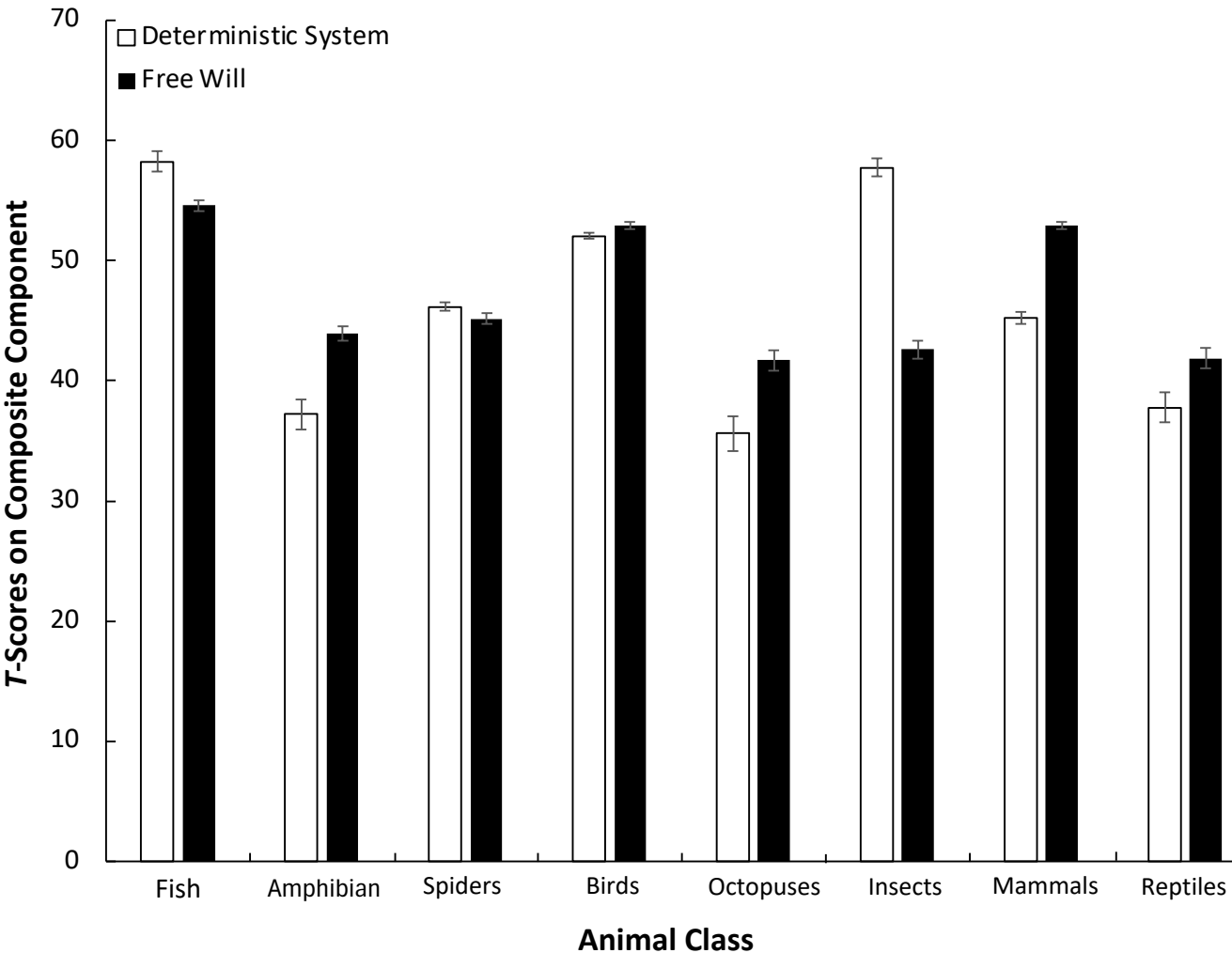
**The system of agents does not abandon determinism in favor of free will, or vice versa.** Instead, it creates a dynamic balance where structure provides stability and individual agency provides adaptability. Early on, when groups establish basic functioning, there is a focus on **delivering the scaffolding of the deterministic system.** Later, when the foundation is solid, there is **more room for refined changes to the deterministic system, given the desire for free will choices of the animals.**

This temporal pattern explains why the free will vs. determinism debate has been so persistent—we have been looking at snapshots instead of watching the movie. At any given moment, one force might appear more prominent than the other, **leading us to conclude that only one can be "real."** However, when you step back and watch the full story unfold, **you see both structures playing essential, complementary roles in the grand choreography of social life.** Speaking of which, let’s look at the individual preferences of these animals.

**The Animal Kingdom Personality Test: A Fight for Free Will**

Here is where it gets fascinating. It turns out that different types of animals show dramatically different balances between the deterministic structure and free will—the results might surprise you.

**Fish and insects are crushing it in the deterministic department.** This finding makes perfect sense when you think about it. **Fish schools and insect colonies are some of nature's most impressive examples of collective**

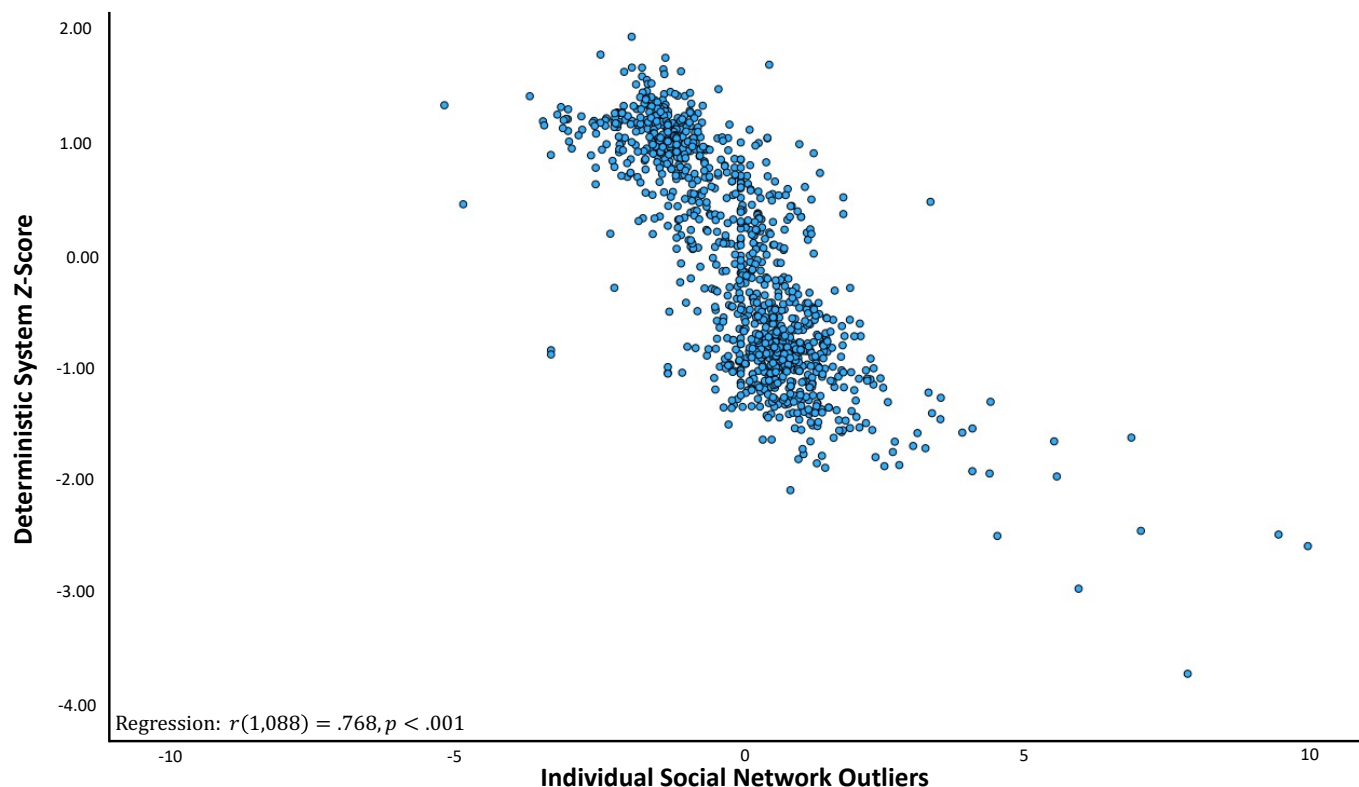


**behavior.** When thousands of sardines move as one perfectly coordinated unit, or when ant colonies build complex structures through simple individual rules, you are watching deterministic structure at their finest. Yet, here is what is cool—fish also show strong free will scores. **Even within those gorgeous, flowing schools, individual fish are making tons of personal decisions about where to position themselves, when to break away to feed, and how to respond to threats.** The school provides a deterministic system, but each fish still exercises agency within it.

Amphibians show the lowest deterministic scores but decent free will scores. Think about frogs and salamanders—they are kind of the ultimate individualists of the animal world. They do not form complex social hierarchies or live in highly structured groups. Instead, they are more like independent contractors, making it up as they go along with relatively few biological constraints on their social behavior.

Here's where it gets fascinating. **Mammals—including us—score pretty middle-of-the-road on both measures (around 45 for deterministic, 53 for free will).** We like to think we are the kings and queens of free will, but octopuses beat us slightly on that front! Those eight-armed geniuses are making incredibly creative, individual choices about how to solve problems and interact with their world. However, **a key point to remember here is that neither the deterministic system nor free will is inherently good or bad;** it all comes down to the function of the species and how it optimizes its environmental influence. If we all acted as individualistic as octopuses, then we would not have the many great things we have that we obtained from working together.

**Spiders show an almost perfect balance between free will and their deterministic system,** which makes sense when you think about web-building. There is a strong biological program that determines the basic architecture of the web; still, each spider makes thousands of individual decisions about exactly where to place each strand based on local conditions. On the other hand, **birds are fascinating because they score relatively high on both measures.** Think about murmurations—those incredible aerial dances where thousands of starlings move as one fluid entity. **There is clearly a strong deterministic component** (following simple rules about staying close to neighbors), but also a significant amount of individual decision-making happening in real-time.



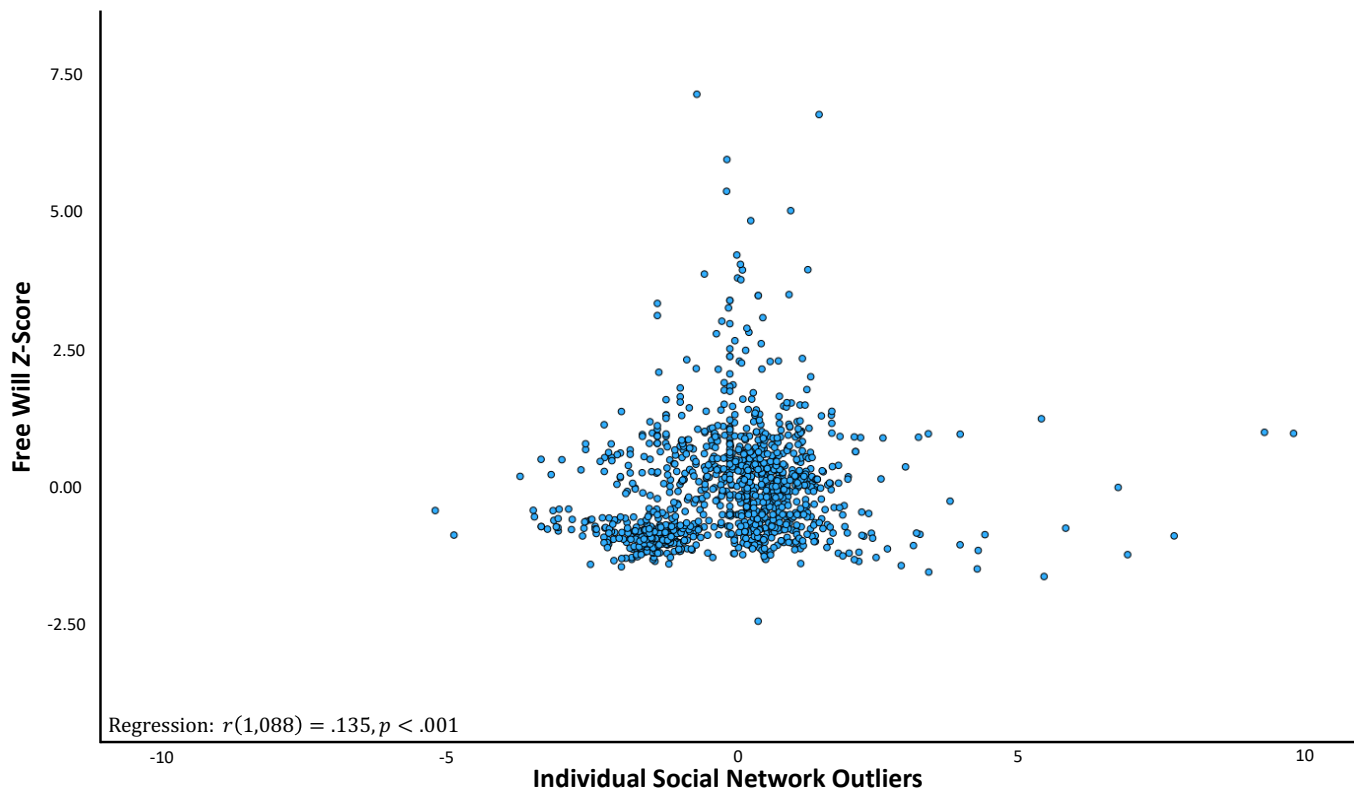
**What this figure reveals is that there is no such thing as a "free will species" or a "deterministic species."** Every single animal class shows significant degrees of both structures. Even the most socially oriented animals (such as fish and insects) still exhibit substantial individual agency; even the most individualistic animals (like amphibians) still operate within deterministic constraints.

### **The Rebels & Conformists: What Happens When You Go Against the Grain**

Here's where the data gets really juicy. This figure shows what happens to deterministic systems when individuals start acting like **social outliers—the rebels, the misfits, the ones who just do not fit the typical mold of their group**. I personally cannot relate to these agents because I always play by the rules... right? Anyway, the x-axis measures "Individual Social Network Outliers"—basically, how much an individual's behavior deviates from what you would expect based on their group's standard patterns. **A z-score of zero means you are perfectly average for your group**. Negative scores mean you are more conformist than usual, while positive scores mean you are bucking the trend.

Look at that powerful relationship ( $r = .768, p < .001$ )—it is one of the strongest correlations in the entire dataset. What this finding tells us is mind-blowing: **the more an individual conforms to typical group behavior, the stronger the deterministic structures become in their social environment**. Think about what this means in real life. When everyone in a group acts predictably—following established social rules, sticking to familiar patterns, and doing what is expected—**the deterministic system gets reinforced and amplified**. It is like the group collectively creates a stronger gravitational field that pulls everyone toward standard behavior.

At the same time, look at what happens on the right side of the graph. **As individuals become more unique and more willing to deviate from group norms, the deterministic structure around them weakens**. The outliers—the individuals scoring high on the right—exist in social environments where deterministic pressures are much lower. **This finding does not mean that rebels destroy the system**. Instead, it reveals something profound: when individuals exercise their free will in creative or unconventional ways, **they create space for more individual agency to emerge**. Their willingness to be different reduces the deterministic pressure on everyone around them—**free will is contagious**.



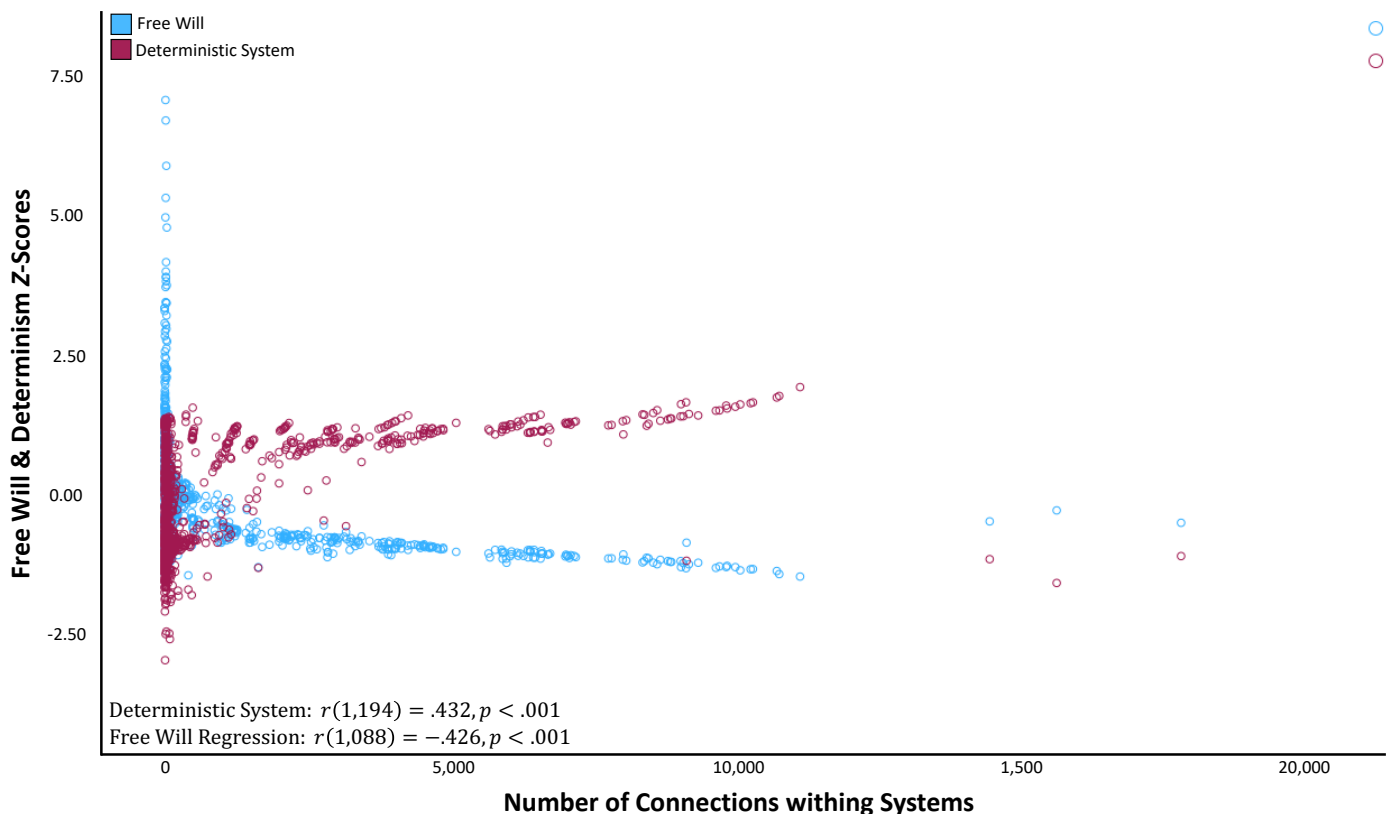
The left side of the graph reveals what we might call the "conformity trap." When individuals consistently choose to go along with group expectations, they inadvertently strengthen the very structure that limit individual choice. It is not that they are wrong to conform—sometimes it is the wise choice—but their conformity reinforces the system, **making the deterministic structures stronger for everyone—the deterministic system is also contagious.**

The beautiful thing is that both extremes serve essential functions; again, **free will and the deterministic system are not inherently good or bad.** Strong deterministic structure provide stability, predictability, and social cohesion when groups need to function smoothly, but outliers provide innovation, adaptation, and creative solutions when groups need to evolve and respond to new challenges. This figure reveals that free will and determinism are not just coexisting—they **are dynamically regulating each other.** Individual choices directly influence the extent to which deterministic structural constraints exist in the system, while structural constraints determine the degree of room for free will via individual choices. It is a continuous, **recursive feedback loop in which your personal decisions about conformity or rebellion shape the social organization around you.**

You can notice in this figure above that free will does not change very much, unlike the malleability of the deterministic system, **supporting the claim that the deterministic system is an emergent property of aligned free will choices.** It is as if nature has discovered that the sweet spot for survival and thriving is not maximizing one force over the other—it **is finding the right balance between structure and flexibility, between collective coordination and individual creativity.** Different species have found different optimal balances, but none have abandoned either system entirely. The lesson? Whether you are a fish, a frog, or a human being, you are living proof that free will and determinism are not enemies—they **are dance partners, and the best dancers know how to let both structures lead.**

## Determinism is the Glue of Systemic Structures

This graph reveals one of the most important discoveries in the entire dataset: **both free will and determinism get stronger as social networks grow larger; they do it in almost identical ways** ( $r = .426$  for deterministic,



$r = .432$  for free will)—which is pretty remarkable evidence that these features truly are partners, not competitors. Look at the left side of this figure, where we have small social networks with just a few dozen connections. These groups cluster around the middle for free will and determinism—there is some structure, some individual choice, but neither is particularly strong. It is like a small friend group where there are loose social dynamics but not much pressure in either direction.

But watch what happens as groups get bigger. Both the blue dots (free will) and red dots (deterministic system) start spreading out more dramatically. **The bigger the social network, the more extreme the scores become in both directions.** Think about it like this: in a small group of 5 friends, there is not much room for complex social structures to emerge, but there is also not much need for individual agency to assert itself. **Everyone kind of knows everyone, informal coordination works fine, and there's not much social complexity to navigate.**

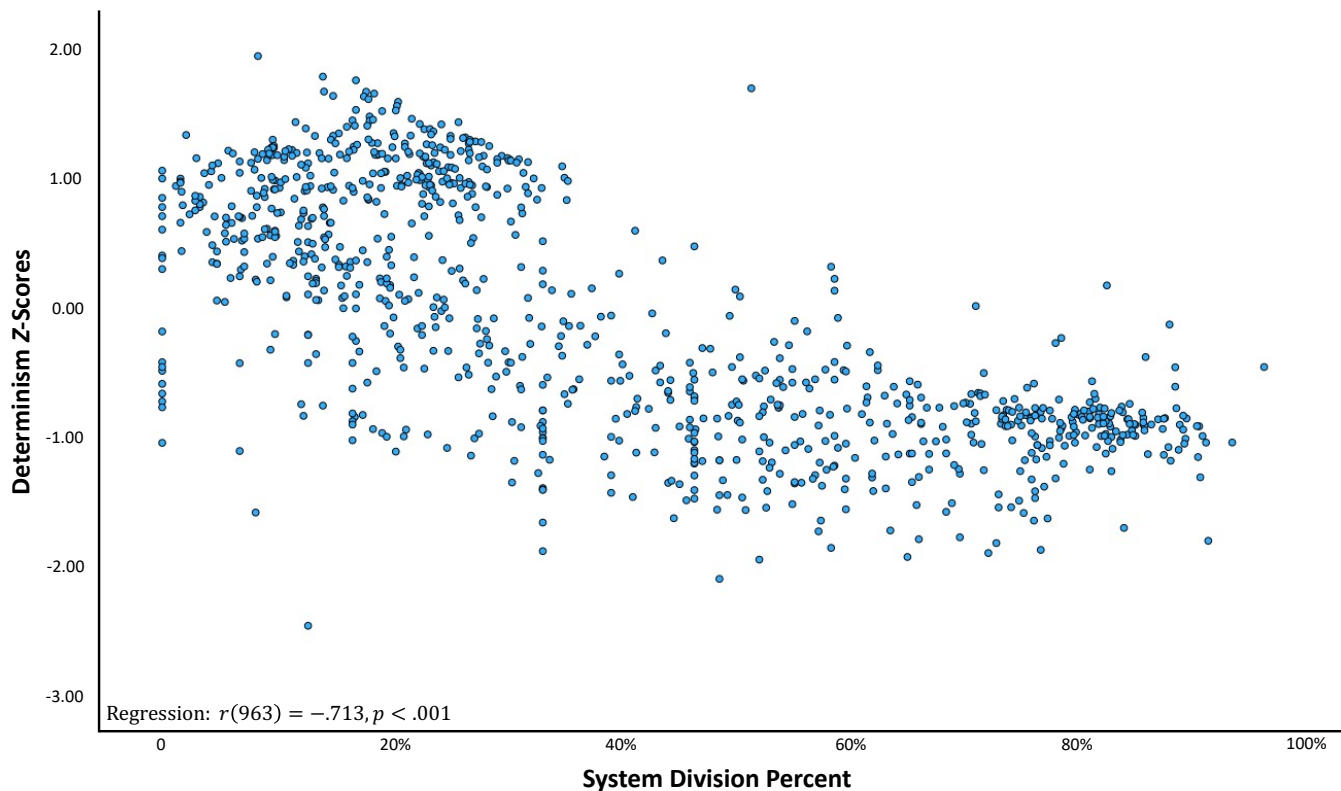
However, if you scale that system up to a community of 500 or 5,000, suddenly everything changes. Large groups require a stronger deterministic system to sustain the scaling of the system or agents—clear hierarchies, established roles, and predictable patterns—to function without falling into chaos. **You cannot coordinate a thousand individuals through casual conversation and informal agreements.** At the same time, large groups create more *opportunities* for individual agency to matter. In a small group, there might only be a few social niches available. But in a large community, there are countless ways to contribute, endless possibilities for specialization, and multiple pathways for individual creativity and choice to make a real impact. Thus, the decline in free will we see in this figure might not stem from giving up individuals' choices for the system; **it is likely that when the deterministic system is large enough, it creates enough opportunities for people to find their niche. When people find their path to become their best self, they do not need to make as many choices to reach their destiny.** The deterministic system provides defined pathways that make living structured and clear while also providing value to the whole species to continue to grow and thrive.

What we are seeing is that **scale amplifies the deterministic system, which allows for well-organized pathways to thriving and growth.** It is not that large groups become either more deterministic OR less freer—they become more efficient and effective at scaling. The structure becomes more elaborate and powerful, while the opportunities for individual expression become more diverse and meaningful. This finding sheds considerable light on human societies. Small tribes can function with relatively informal social structures and limited role differentiation. However, cities and nations require complex institutions, laws, and social systems (deterministic features) while simultaneously creating unprecedented opportunities for individual creativity, entrepreneurship, and personal choice (free will).

Notice that the strongest correlations happen in that middle range—groups large enough to need real structure but not so massive that they become unwieldy, **which might explain why we have geographical divisions like countries, cities, and provinces.** So, what is the takeaway? **If you want to maximize your freedom and effectiveness, you should avoid going it alone in small groups and steer clear of massive, impersonal systems.** You want to find that sweet spot where there is enough structure to amplify your impact and enough scale to create real opportunities for your unique contributions to matter.

### **The Great Division: Why Unity Kills Determinism but Barely Touches Free Will**

These final two graphs reveal something profound about how social division affects free will and determinism, and the results tell **a story that could reshape how we think about community, politics, and human nature itself.** The first figure shows one of the strongest relationships in the entire dataset ( $r = -.713, p < .001$ ). When social groups are highly unified—everyone socializing together, with no clear subgroups or factions—the deterministic system is at its absolute peak. But watch what happens as groups become more divided: **deterministic systems plummet dramatically.**

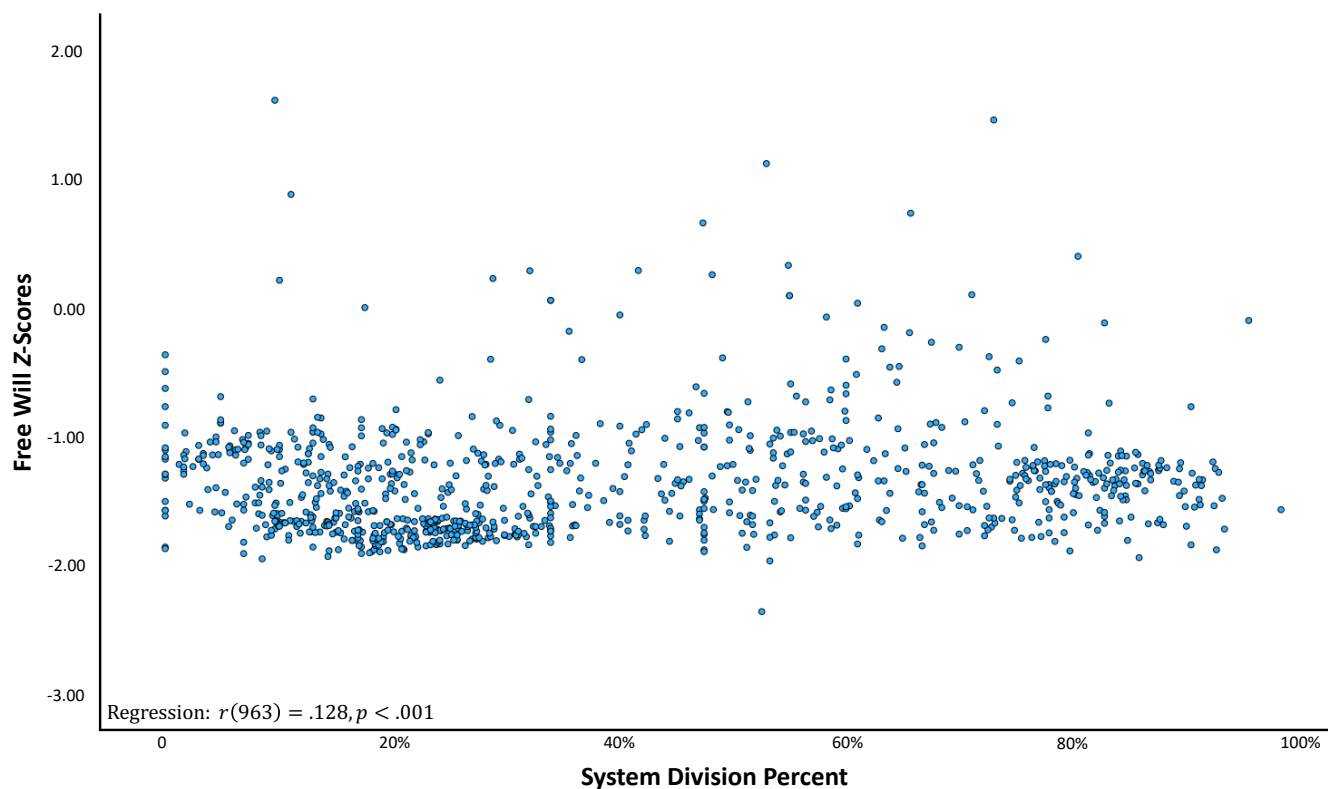


This finding makes intuitive sense upon consideration. When everyone is part of one big, happy family, **there is enormous pressure to conform to group norms**. The social organization is simple and effective—everyone knows the rules, everyone follows them, and the system runs smoothly. That is the deterministic system in its purest form. However, as soon as you get competing subgroups, competing loyalties, and competing visions of how things should work, **that deterministic system start breaking down**. Different factions develop different norms. The "one right way" to do things suddenly becomes multiple "right ways." The social physics gets messy, contradictory, and much less predictable.

Now look at the second figure—free will and division. There is still a relationship ( $r = .128, p < .001$ ), but it is dramatically weaker. **Free will does not care nearly as much about whether the group is unified or divided**. This finding is simply fascinating because it suggests that individual agency—your ability to make meaningful personal choices via free will—**operates relatively independently of social division. Whether your community is harmoniously united or split into warring factions, you still have roughly the same capacity for free will**. Here is what these figures reveal that might make some people uncomfortable: **social unity and individual freedom exist in tension with each other. The most harmonious, unified communities are also the most deterministic**—the places where individual choice matters least and social pressure matters most. **Conversely, divided communities**—places with competing subgroups, political factions, or cultural tensions—preserve more space for individual agency. **When there is no single dominant social framework, individuals have more room to navigate between competing options and craft their path.**

These data help explain why diverse, pluralistic societies often feel chaotic but produce incredible innovation and individual achievement, while highly unified societies feel stable but can become stagnant. It is not a bug—it is a feature. Division creates choice, even as it reduces predictability. **The optimal balance might not be maximum unity after all**. Instead, it might be finding that sweet spot where there is enough division to preserve individual freedom, but not so much that the system becomes dysfunctional. **Some tension between subgroups might be healthy for maintaining space for personal choice and individual expression.**





If you want to maximize your own free will, you may not want to live in the most harmonious and unified community you can find. Instead, you might want to find a place with a healthy diversity of thought, competing perspectives, and multiple social pathways to success. A certain degree of social complexity may be the price of personal freedom. Also, suppose you are trying to build institutions or communities. In that case, these data suggest you face a fundamental tradeoff: you can optimize for smooth functioning and predictable outcomes (high unity, strong deterministic system), or you can optimize for individual creativity and personal agency (more division, more free will). But you cannot appear to maximize both simultaneously, **and that is okay**. The ancient philosophical debate between free will and determinism might have been missing the point entirely. The real question is not which phenomenon is stronger—it is **how social conditions amplify or diminish each one, and what kind of communities we want to create as a result**.

### The Big Picture

For over two thousand years, humanity's greatest minds have been stuck in a debate that was broken from the start. We kept asking, "Do we have free will, OR are we controlled by determinism?" when we should have been asking, **"How do free will and determinism work together?"** Think about it this way: you are riding on a cosmic escalator that is constantly moving, and it is built by you, me, and all the other human agents on Earth. **That is the deterministic system**—the structure of biology, environment, and circumstance carrying you forward whether you like it or not, with some life paths that are easier than others, more fit your traits and abilities than others, more rewarding in the system than others, and all dependent on structures outside of your control. At the same time, **just because you are on an escalator does not mean you are paralyzed**. You can still walk around, dance, help someone, start a conversation, or choose to be a jerk. **That is your free will, and it is completely authentic**.

These data suggest that free will and the deterministic system work on different timelines. When groups first form, deterministic structure are strong—biology and instinct take over to organize things. However, as time passes, **the system evolves and improves, just like everything else in existence**. Further, your personal choices actually change the balance. **When you conform, you strengthen the deterministic system around everyone**.

**When you rebel or act uniquely, you create more space for everyone's free will.** Finally, larger groups reinforce the deterministic system inherently, as we naturally adjust to scale the growth and flourishing of our fellow agents within the system. Large communities need more structure to function, but they also create way more opportunities for individual creativity and impact.

**These findings significantly alter how many people might think about life.** My only advice, if I may provide some, is to stop trying to choose between "going with the flow" and "being your own person." **You already do both to varying degrees, and that is how it works for everyone.** Work with a deterministic system that supports you while allowing you to make your own unique choices within it; **it helps all of us out when you do so.** Your destiny is not some predetermined situation—it is about taking the hand you have been dealt and playing it as creatively as possible. **Remember, dear reader, it is never too late for you to find your path to your destiny; it already exists, and when you find it, all you have to do is look forward and keep going.**